de Francisco Carvalho, Lucas; Primi, Ricardo
Development and Internal Structure Investigation of the Dimensional Clinical Personality Inventory

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Desenvolvimento e Investigação da Estrutura Interna do Inventário Dimensional Clínico da Personalidade (IDCP)

Lucas de Francisco Carvalho* & Ricardo Primi
Universidade São Francisco, Itatiba, SP, Brazil

Abstract

This study aimed to develop a dimensional instrument to assess personality disorders based on Millon's theoretical perspective and on DSM-IV-TR diagnoses criteria, and seek validity evidence based on internal structure and reliability indexes of the factors. In order to do that, a self-report test composed of 215 items, the Dimensional Clinical Personality Inventory (DCPI) was developed and applied to 561 respondents aged between 18 and 90 years (*M* = 28,8; *SD* = 11.4), with 51.8% females. Exploratory factor analysis and verification of reliability were performed using Cronbach's alpha. Data provided validity evidence based on internal structure of the instrument according to the theory of Millon and DSM-IV-TR.

Keywords: Test development, psychiatric disorders, psychometric properties.

Resumo

Este estudo teve como objetivo desenvolver um instrumento de caráter dimensional para avaliação dos transtornos da personalidade baseado na teoria de Millon e nos critérios diagnósticos do DSM--IV-TR, e buscar evidências de validade com base na estrutura interna e índices de fidedignidade dos fatores. Para tanto, foi desenvolvido e aplicado um teste de autorrelato composto por 215 itens, o Inventário Dimensional Clínico da Personalidade (IDCP), em 561 pessoas com idade variando entre 18 e 90 anos (*M*=28,8; *DP*=11,4), sendo 51,8% do sexo feminino. Procedeu-se a análises fatoriais exploratórias e verificação da fidedignidade por meio do alfa de Cronbach. Os dados encontrados favorecem as evidências de validade do instrumento de acordo com a teoria de Millon e o DSM-IV-TR.

Palavras-chave: Construção de instrumentos, transtornos psiquiátricos, propriedades psicométricas.

Personality traits can manifest in a healthier or more pathological way, and a *continuum* is established between these poles (Widiger & Trull, 2007). A more pathological personality functioning may be characterized by three global attributes: adaptive inflexibility, vicious circle, and tenuous stability (Millon, Millon, Meagher, Grossman, & Ramanath, 2004).

Adaptive inflexibility refers to a small number of little effective strategies employed to achieve objectives, relate to others, or deal with stress; the vicious circle relates to perceptions, needs, and behaviors that perpetuate and intensify pre-existing difficulties in the individual; and the tenuous stability is related to a lower resilience of the individual against psycho-stressor conditions. People who tend to manifest these characteristics at high levels may have a diagnosis of personality disorders.

In general, the reactions displayed by people diagnosed with personality disorders are inflexible, implying conflicts in the ability to deal with the environment, as well as significant disruptions in their lives. Personality disorders can be understood as representations of many styles or patterns in which personality is mal-adapted to its environment, bringing major disruptions in one's life (Millon, 1999; Millon & Davis, 1996; Millon, Grossman, & Tringone, 2010). This definition is consistent with the proposal of Skodol et al. (2011) for the future edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM), DSM-5, which also emphasizes the disability to present an adaptive functioning. In this study, Millon's definition for personality disorders will be used as a basis.

Various models and theories for the evaluation and diagnosis of personality disorders are found in the scientific literature. Among these proposals, the theory by Theodore Millon (Millon & Davis, 1996; Strack & Millon, 2007) is characterized as an integrative and evolutionary model, encompassing perspectives of individual (ontogenetic), cultural, and human (phylogenetic) learning. In addition,

for the understanding of personality disorders we consider attributes of the categorical diagnosis and the dimensional diagnosis, from which the prototypical perspective of these disorders originates (Millon et al., 2004).

The prototypes proposal by Millon (Millon & Grossman, 2007a, 2007b; Millon et al., 2010) aims to integrate the categorical and dimensional models for the understanding of personality. It considers that certain features tend to covariate more than others, so they may be grouped (categorical perspective), although there is no absolute feature that defines a group of categories and, thus, all characteristics should be assessed (dimensional perspective). It should be emphasized that, despite the prototypical character of Millon's theory, the system of evaluation and diagnosis proposed by the author approaches a continuous version of the categorical model, which may be observed, for instance, in the instrument for assessing personality disorders developed by Millon, Millon, and Davis (1994), which presents the results on a continuous scale (*T* scores), as well as on the categories (dependent, paranoid, among others) proposed by DSM-IV-TR (American Psychological Association [APA], 2003).

Grounded on the ontogenetic, cultural, and phylogenetic basis, Millon (Millon & Grossman, 2007a, 2007b) proposes fifteen pathological personality types (or styles). They are: Schizoid, Avoidant, Depressive, Dependent, Histrionic, Narcissistic, Antisocial, Sadistic, Compulsive, Negativistic, Masochist, Paranoid, Schizotypal, Borderline, and Hypomanic. Currently the literature based on Millon's theory has been developing on the hypomanic style, so this pathological personality style was not considered in the present study.

The proposal in fifteen styles is based on three levels, the evolutionary phases, which are consistent with the evolutionary principles, each represented by a bipolarity. The phases are: Existence, Adaption, and Replication. Each phase represents a period of development based on evolutionary assumptions (Davis, 1999; Millon & Davis, 1996; Millon et al., 2010; Millon et al., 2004; Strack & Millon, 2007).

The first phase, Existence, is related to the tendency to express mechanisms that favor the pursuit of pleasure, focus on the search for pleasurable experiences and gains, and the avoidance of pain, focus on avoiding actions or situations that are dangerous and bring damage. Once the individual is oriented, he needs to maintain his existence through a complex relationship with the environment. The second evolutionary phase, Adaption, is related to ways of adapting that enable an interaction between the individual and the environment. Some people tend to change the environment around (active trend), and others are more likely to accommodate to the environment in which they live (passive trend). After Adaption, the third evolutionary phase (Replication) is about the continuity of the individual, which is limited by time. This evolutionary phase concerns the strategies developed by people to overcome the limitation of existence itself, which can be self-propagating, individuals more focused on the self, or, strategies aimed at the care of offspring, or individuals more focused on others.

From this theoretical proposal, Millon and colleagues developed the *Millon Clinical Multiaxial Inventory* (MCMI), used for the evaluation and diagnosis of not only personality disorders, but also clinical disorders described on Axis I of DSM-IV-TR (APA, 2003). The group's goal was to develop a self-report instrument for the assessment of psychiatric disorders. Therefore, at the end of the same decade the MCMI was launched. In the 10 following years adjustments to the DSM-III were performed, also based upon reformulations on Millon's theory. By the late 1980s the MCMI-II was launched. Similarly, based on the MCMI-II, new reformulations were made to the instrument; all based on the DSM-IV-TR, having as a final product the MCMI-III (Millon et al., 1994).

Specifically in relation to the MCMI-III, the instrument was administered to 1079 patients of clinics, psychologists, and psychiatrists, who completed a document evaluating several characteristics of patients' personality disorders. Therefore, since the release of the first version of the MCMI, there was always a concern to operationalize symptoms (characteristics) described on the DSM, as well as a strong clinical and theoretical basis. Therefore, we did not adopt a dimensional perspective seeking to discover empirically how many variables are required to represent the disorders in terms of profiles; instead, we used a prototypical perspective investigating a set of correlated features that could represent the disorder in a continuous manner by means of scales. This line of reasoning is close to the system in which the current version of DSM is grounded, since both cases consider the clinical support for the cluster of symptoms and the possibility of developing diagnostic characteristics, even though the DSM is not characterized as a prototypical system, mainly because it is a dichotomous way of diagnosis.

Besides this, there are studies on the literature investigating the internal structure of both the MCMI (Cuevas, García, Aluja, & García, 2008; Rossi, Elklit, & Simonsen, 2010) and the DSM-IV-TR (Huprich, Schmitt, Richard, Chelminski, & Zimmerman, 2010) through factor analysis. In such cases, the results are not favorable according to what is expected a priori, which is probably due to the reasoning underlying Millon's theory and the DSM-IV-TR (i.e., the focus on the grouping of people and not on the investigation of the possible grouping of variables).

From the theoretical and clinical perspective, Millon's proposal presents gains at the expense of other restricted models in this perspective. However, from a pragmatic-empirical point of view, even because it is a complex proposal, there is no robust evidence supporting the whole theoretical framework proposed by Millon. Thus, despite the theoretical strength of this proposal, the lack of empirical evidence testing its assumptions is not consistent with the guide of changes for the next edition of DSM, DSM

5, proposing that the choice should be based on a large number of studies demonstrating the empirical strength of the model, besides the theoretical robustness (Kendler, Kupfer, Narrow, Phillips, & Fawcett, 2009).

According to what was presented, on the one hand, one can notice the theoretical force permeated in Millon's theory, allowing an exhaustive and thorough understanding about the pathological personality styles. On the other, it faces a lack of empirical support of the instrument's scales (and, therefore, of the types of functioning which seeks to evaluate), based on the categories of DSM-IV-TR (APA, 2003) that are proposed in the MCMI-III. Considering the various criticisms in the literature to the categorical perspective for the assessment and diagnosis of personality disorders (Brown & Barlow, 2005; Widiger & Trull, 2007; Zimmerman, 2011) to the detriment of the dimensional perspective (which seems to be more robust from the empirical point of view), we considered the development of an instrument that would follow similar steps to those used on the construction of the MCMI, but that were subjected to more traditional procedures of empirical test to verify its internal structure. In this perspective, the present study aimed to develop an instrument of dimensional character to assess personality disorders based on Millon's theoretical perspective and in diagnostic criteria established by the DSM-IV-TR (APA, 2003), as well as to submit it to an empirical testing on the internal structure validity and the reliability indices of the scales.

Method

This topic has been subdivided into two distinct steps, as follows: Phase I, development of the instrument; and, Phase II, search for evidence of validity based on internal structure, and investigation of the reliability of the scales of the instrument developed in Phase I.

Phase I – Construction of the Instrument

At this initial stage, the aim was to develop an instrument for assessing personality disorders based on Millon's theory (Millon & Davis, 1996; Millon & Grossman, 2007a, 2007b; Millon et al., 2010; Millon et al., 2004) and on the diagnostic criteria of the categories presented on axis II of DSM-IV-TR (APA, 2003). We also considered the data presented in the literature based on the MCMI-III (Millon et al., 1994) and a national instrument constructed in accordance with Millon's theory, the Dimensional Inventory of Personality Disorders (*Inventário Dimensional dos Transtornos da Personalidade* [IDTP]; Carvalho, 2008).

To this end, the authors of the present study developed items operationalizing the DSM-IV-TR (APA, 2003) criteria relating to personality disorders and also reviewed items previously established (Carvalho, 2008). From the items developed, we formed a group of systematic study throughout one semester, with weekly meetings of about 3 hours each. The meetings were performed by five members: the authors of this study, two Psychology PhD students who had performed studies in the area of mental health and psychometrics, and one Psychology Masters student with expertise in psychometrics. The aim of these meetings was to increase knowledge on the model of personality disorders based on Millon and on DSM-IV-TR, and to select the items regarded as the most adequate among those developed by the authors on this research. Furthermore, we sought to classify items according to the DSM-IV-TR criteria.

As a result of the meetings, we created a database composed of 541 items which were ranked, according to the content, in the following criteria: respective personality disorder according to Millon's theory and the DSM-IV-TR; respective DSM-IV-TR criteria; compatible item of the MCMI-III (when existing); and, compatible item of the IDTP (when existing). We sought to develop at least two items by DSM-IV-TR criterion, and in most cases we developed a higher number than the minimum established. As an illustration of the developed items, stand out the items "I do not mind exaggerating to get attention from others", assessing typical characteristics of the histrionic functioning, and "usually people are not trustworthy", assessing typical characteristics of paranoid functioning. In Table 1 we present the distribution of items according to the criteria presented in DSM-IV-TR (APA, 2003), which was also done by Millon et al. (1994).

Table 1 presents the columns relating to the DSM-IV-TR criteria (C1-C9), a column containing the criteria respective to the disorders, and another column with the total number of items per disorder. Columns C8 and C9 obtained number zero when the disorders (for instance, schizoid and avoidant) had a number of criteria lower than eight and nine.

From the items developed by the authors of this study, we selected those which, according to the research group, better represented the characteristics and symptoms of the different personality disorders. As a result, we have reached a number of 215 items representing the instrument, called Dimensional Inventory of Personality Disorders (*Inventário Dimensional Clínico da Personalidade* [IDCP]). The items were distributed according to the diagnostic characteristics of personality disorder, as follows: schizoid (14 items), avoidant (14 items), depressive (14 items), dependent (16 items), histrionic (16 items), narcissistic (18 items), antisocial (14 items), sadistic (16 items), compulsive (16 items), negativistic (14 items), masochist (15 items), paranoid (14 items), schizotypal (18 items) and borderline (16 items).

It is observed that the number of items for the IDCP disorder ranged from 14 (schizoid, avoidant, depressive, antisocial, negativistic, and paranoid) and 18 (narcissistic and schizotypal). Moreover, it is noteworthy that all criteria are represented on the 215 items selected. Next, the 215 items were ordered in the following sequence: compulsive, narcissistic, borderline, antisocial, dependent, depressive, schizoid, schizotypal, avoidant, histrionic, masochist,

Table 1

Descriptive Data of Items According to the DSM-IV-TR Criteria

Disorder	Total	Criteria								
		C1	C2	C3	C4	C5	C6	C7	C8	C9
Schizoid	33	9	4	3	4	6	4	3	-	-
Avoidant	46	7	6	6	10	8	5	3	-	-
Depressive	38	13	4	4	2	5	5	4	-	-
Dependent	38	9	6	5	5	3	4	3	3	-
Histrionic	42	7	7	6	5	3	6	4	4	-
Narcissistic	66	10	10	9	8	5	7	8	5	4
Antisocial	54	9	9	6	6	7	7	10	-	-
Sadistic	41	8	7	6	4	3	5	5	3	-
Compulsive	39	6	5	6	8	2	5	4	3	-
Negativistic	37	6	5	4	4	10	5	3	-	-
Masochist	40	8	5	4	4	5	3	7	4	-
Paranoid	31	8	4	5	4	3	3	4	-	-
Schizotypal	43	3	8	4	7	5	5	3	4	3
Borderline	38	8	5	4	4	4	2	3	3	5

negativistic, paranoid, and sadistic and then again the same ordering (completing 28 groups of items). In the instrument, each subgroup of items is highlighted by color lines (white or light gray). Still, we were careful to start with the compulsive and narcissistic disorders as they present items whose pathological aspect is not so clear.

Phase II – Validity Evidence Based on Internal Structure, and Investigation of the Reliability of the Instrument's Scales

Participants. There were 561 participants, aged between 18 and 90 years (M=28.8; SD=11.4), and 293 were women (51.8%). The sample was composed of university students without psychiatric diagnosis (n=434) and by patients diagnosed with psychiatric disorders (n=127) from axis I and/or axis II according to the DSM-IV-TR (APA, 2003), from a private clinic and a psychiatric hospital. Psychiatric patients were diagnosed by psychiatrists through unstructured evaluations (n=77) and by the Structured Clinical Interview for DSM IV axis II (SCID-II; n=50). Most participants responded "graduate level" (76%) in school, and all subjects were from the state of São Paulo. Table 2 presents the diagnostic prevalence in the sample of patients diagnosed with psychiatric disorders.

It can be observed that for patients from the psychiatric hospital, there was a higher prevalence of mood and anxiety disorders in relation to axis I of the DSM-IV-TR (APA, 2003), and avoidant and obsessive personality disorders in axis II. With regard to the patients of the psychiatric clinic, we observed an almost absence of the diagnosis of axis II and, regarding axis I, there was a greater prevalence of substance abuse and mood disorders.

Instruments. We applied the IDCP instrument, which was developed in Phase I of this study. As previously described, it is a self-report inventory consisting of 215 items, representing typical features of personality disorders. The instrument must be responded on a Likert-like scale of four points for the responses on the IDCP, being, 1 for "*nothing – it has nothing to do with me*", 2 for "*little – it has a little to do with me*", 3 for "*moderately – it has something to do with me*" and 4 for "*much – it has much to do with me*". The approximate time of application was 30 minutes.

Procedure and Design. Participants completed the instrument, and all received the Term of Informed Consent (Protocol CAAE 0350.0.142.000-08), which included the main objective of the study and dissemination of the results according to ethical standards. The applications were accomplished, in the case of university students, in private universities in the state of São Paulo; and in the case of psychiatric patients, in the waiting rooms of the state of São Paulo, be it in private clinic or public hospitals. For most of the data analysis, the Statistical Package for the Social Sciences version 15 was used. Moreover, we also used the programs R version 2.15.3 and MPLUS version 6.12.

Table 2
Prevalence of Disorders in Individuals with Psychiatric Diagnosis

Axis (DSM-IV-TR)	Disorders	Psychiatric Hospital (*n*=77)	Psychiatric Clinic (*n*=50)
Axis I	Mood disorders	55 (60.6%)	22 (44%)
	Drug addiction	2 (2.5%)	34 (68%)
	Anxiety disorders	29 (37.6%)	15 (30%)
	Psychotic disorders	5 (6.4%)	10 (20%)
	Other disorders	5 (6.4%)	5 (10%)
	Eating disorder	4 (5.1%)	--
	Adjustment disorder	1 (1.2%)	--
	Somatoform disorders	5 (6.4%)	--
Axis II	Dependent personality disorder	5 (6.4%)	--
	Obsessive personality disorder	17 (22%)	--
	Avoidant Personality Disorder	20 (25.9%)	--
	Borderline Personality Disorder	10 (12.9%)	1 (2%)
	Histrionic Personality Disorder	5 (6.4%)	--
	Schizoid Personality Disorder	3 (3.8%)	--
	Paranoid Personality Disorder	12 (15.5%)	--
	Narcissistic Personality Disorder	7 (9%)	--
	SOE Personality Disorder	12 (15.5%)	--
	Schizotypal personality disorder	3 (3.8%)	--

Results

First, we sought to determine how many dimensions would be required to explain the structure of correlations between the items that were developed. As these items were created to represent the typical characteristics of the 14 disorders, we expected to find factors that were consistent with these types of pathological functioning. For this, we used exploratory factors analysis by principal axes (*principal axis factoring*)[1]. This method analyzes only the shared variance between variables (Tabachnick & Fidell, 2007).

Initially, a parallel analysis was used as a criterion for determining the minimum eigenvalue to retain relevant

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1   MPLUS software version 6.12 was also used to verify factor solution. MPLUS allows the specification of categorical variables from which it estimates the polychoric correlations. The structures evidenced in this case in terms of the items that would be grouped by factor were quite similar to that extracted using Pearson's correlation, showing that in this case the method of calculation of the correlations wouldn't change the composition of the factors that are presented.

factors. The simulations were performed considering 561 subjects, total number of the sample. A total of 1,000 extractions of random correlation matrices were simulated and we considered the eigenvalue corresponding to the 95th percentile, resulting in a minimum criterion of 2.02 to consider a factor as relevant (Hayton, Allen, & Scarpello, 2004; Watkins, 2006). Also, the R software version 2.15.3 was used to check the maximum number of non-random factors that could be considered, since this statistical program allows determining the minimum eigenvalue for retaining factors based on the extraction by principal axes (common variance) in polychoric correlation matrices. Considering these criteria for extraction, we found 12 factors, which were subjected to analysis by orthogonal rotation (varimax), since the oblique rotation, attempted initially, was not justified due to the low magnitude of correlation between the factors (lower than .30).

Before proceeding to the factor analysis, we verified sampling adequacy for the analysis, using the Kaiser-Meyer-Olkin (KMO) index and the Bartllet's sphericity test. The KMO was .92, indicating a good data adequacy for factor analysis, and the Bartlett's sphericity test was

significant at .001 ($\chi2$= 72561.900; *df*= 23005), showing that there were sufficient correlations between variables for the use of factor analysis.

Table 3 presents a summary of the data found in the exploratory factor analysis. We obtained twelve factors with more than one item and eigenvalues above 2.02, which were able to explain 40.6% of the total variance (the first factor explaining 23.4%). It should be pointed out that factors 13 and 14 also reached the eigenvalue criterion > 2.02, but did not obtain more than one item, so they could not be interpreted. The same table also presents a summary of the items' factor loadings on factors.

Table 3
Summary of Data Found in Exploratory Factor Analysis

Factor	Loadings	N. of items	Eigenvalue	Explained Variance (%)	Predominance PD
1	.31-.69	57	50.4	23.4	Dependent (24.5%)
2	.30-.65	47	10.1	4.7	Sadistic (319%)
3	.30-.65	43	5.6	2.6	Borderline (30.2%)
4	.31-.64	35	5.2	2.4	Schizotypal (34.2%)
5	.30-.66	19	4.5	2	Histrionic (57.8%)
6	.30-.53	20	3.6	1.7	Paranoid (45%)
7	.30-.47	13	3.3	1.5	Narcissistic (61.5%)
8	.30-.54	10	2.6	1.2	Schizoid (50%)
9	.33-.56	9	2.6	1.2	Avoidant (44.4%)
10	.46-.61	7	2.4	1.1	Masochist (71.4%)
11	.30-.56	10	2.2	1	Compulsive (70%)
12	.32-.48	7	2.1	1	Antisocial (42.8%)

In Table 3, the first column refers to the sequence found on the factors. The "loading" column shows the lowest factor loading (having a cutoff previously established at .30) and the highest. The next column describes the number of items with factor loading equal or greater than .30 on each factor, and the columns that follow, the eigenvalues and their explained variance. Finally, the "Predominance PD" column reports what was the predominance of items in that factor in relation to the personality disorder (PD) that the items represented.

As it can be observed, there was a significant variation between the number of items found in each of the 12 factors retained from the factor analysis, and the same goes for the eigenvalue and the explained variance. Besides, we also verified that each of the factors was marked by features more related to a particular style or pathological personality functioning, as shown in the last column of Table 3. Such a trend does not suggest that each personality style is represented by one dimension, but each dimension should present a greater relevance in relation to the different styles. The only disorders that were not distinctly represented on a factor were the depressive and negativistic. The items of the former were distributed in the factors 1, 3, and 4 and the latter, in factors 2 and 3. Even though we did not recover the items of such disorders in independent dimensions, they were grouped into coherent factors.

Continuing the refinement of the scale, items that did not reach the factor loading of .30 on the theoretically consistent factor were eliminated. Thus, we kept items that optimized internal consistency for each scale (i.e., items with relatively high load). We also favored items whose content was appropriate from the theoretical point of view and not imprecise items, and therefore, better operationalized. Furthermore, a more detailed analysis of the content of the items was conducted to formulate a nomenclature that would capture the general meaning of the items. Table 4 presents the number of items selected by factors, the names of factors considering the set of items that compose them, the total number of items, the coefficient of internal consistency of the factors, and a sample item for each factor. It is noteworthy that the total number of items composing the instrument was 162, however, the sum of the items presented in Table 4 results in 176, since some items are overlapping more than one scale. We chose to keep these items, albeit overlapping, since the qualitative analysis of their contents suggested the adequacy for being kept in more than one scale. Moreover, we calculated the descriptive data of participants' scores on the factors.

Table 4
Summarized Data of the Factors and Internal Consistency after Selecting Items

Factor	$\overline{X}$ (SD)	Min.-Max.	Items	α	Examples of items
1. Dependence	1.8 (.6)	1.0-3.7	20	.92	It is common for me to let others make important decisions for me.
2. Aggressiveness	1.6 (.5)	1.0-3.8	27	.91	I tend to get violent when my wishes are not met.
3. Mood instability	2.0 (.6)	1.0-3.9	27	.94	Sometimes, I feel a great emptiness inside me.
4. Eccentricity	1.6 (.6)	1.0-3.8	20	.92	People often say I'm weird.
5. Attention Seeking	2.2 (.5)	1.0-3.8	16	.84	I can seduce people with ease.
6. Distrust	2.1 (.6)	1.0-4.0	13	.83	Others always try to hurt me, use me or cheat on me, but I'm always alert.
7. Grandiosity	1.9 (.6)	1.0-3.8	12	.86	It is natural that special people like me should receive special treatment.
8. Insulation	1.9 (.6)	1.0-3.8	11	.85	I am little interested in making friends.
9. Avoidance of Criticism	1.6 (.7)	1.0-4.0	7	.86	I try not to talk to people, as not to run the risk of being ridiculed.
10. Self-Sacrifice	2.2 (.7)	1.0-4.0	7	.85	I do everything to help others, no matter what will cost me.
11. Conscientiousness	2.5 (.5)	1.3-3.8	11	.69	Tasks should always be performed to perfection.
12. Impulsiveness	1.7 (.7)	1.0-3.8	5	.72	I don't mind if I have to hit someone.

Therefore, Factor 1, *Dependence*, consists of items about beliefs in the individuals' lack of self-trust to make decisions, for believing that he doesn't make things right, depending on others for decision-making. The second factor, *Aggression*, is related to reactions in which the individual does not consider the other to get what they want, and are inconsequent, often violent. *Mood Instability*, Factor 3, is represented by a group of items with respect to the tendency to a sad and irritable mood, but also mood oscillations, which make individuals present impulsive and extreme reactions that often generate guilt. In the next factor, *Eccentricity*, items are grouped regarding the absence of pleasure in being with others, difficulty in trusting others, and beliefs of being different from other people, expressing eccentric, and idiosyncratic behaviors. In factor 5, *Attention Seeking*, items relate to the exaggerated need for attention from others, using mechanisms such as seduction, overreactions, and intensive search for friendships. In *Distrust* (6), there are characteristics related to constant worry of being deceived, beliefs that there are always "second intentions", showing preference by what is known, strictness in relationships, and persecutory delusions.

The seventh factor, *Grandiosity*, groups items reporting irritability due to lack of recognition of the other, showing an exaggerated need for admiration by others with underlying beliefs of merit and superiority. The *Insular* factor, number 8, is represented by items reporting the preference by being alone, irritability with taking orders from others, a decreased pleasure with relationships and avoidance of social interaction. The items representing factor 9, *Avoidance of Criticism*, are about generalized beliefs of incapacity and consequently, that others will humiliate and criticize them. In factor 10, *Self-sacrifice*, the items relate to an exaggerated disregard of the self with evident tendencies to help others. *Conscientiousness*, factor 11, is related to a need to do things as organized and orderly as possible, with a focus on responsibility and obligations, demonstrating excessive worry, perfectionism, strict rules in relationships, and focus on work duties. Finally, the *Impulsiveness* factor (12) deals with reactions of impulsivity and carelessness, with a taste for activities involving violence, ease of making excuses and getting involved in problems.

Regarding internal consistency, 11 scales presented reliability indices greater than or equal to .72 (*M*=.85),

except for factor 11, whose index was .69. Also, regarding the descriptive data of the participants in the dimensions, it is possible to observe that virtually all the factors presented minimal scores (1.0) and all of them presented scores at least near to the maximum (4.0). The lowest means were in the factors Aggression (F2) and Avoidance of Criticism (F9). In contrast, the highest means were found in the factors Conscientiousness (F11), Attention Seeking (F5), and Self-Sacrifice (F10).

Discussion

The present study aimed to developed a dimensional instrument to assess personality disorders based on Millon's theoretical perspective and in the diagnostic categories of DSM-IV-TR axis II, as well as to empirically investigate evidence based on the validity of the internal structure and reliability indices of the scales. In general, we consider that the main scope of the study was achieved, as we obtained an instrument based on Millon's theoretical perspective and on the characteristics of personality disorders presented in DSM-IV-TR, comprising 12 distinct dimensions related to the styles proposed by Millon (Millon & Davis, 1996; Millon & Grossman, 2007a, 2007b), based on a dimensional design. Furthermore, the dimensions that compose the instrument seem to be in agreement with what is theoretically expected, and it is possible to establish relationships between these dimensions and the personality disorders.

However, the data provide evidence of validity based on the internal structure for the IDCP once 12 interpretable dimensions were found, related to the characteristics of all types of pathologic personality functioning according to Millon's theory (Millon & Grossman, 2007a, 2007b) and the DSM-IV-TR (APA, 2003). The number of items on the dimensions ranged from 5 and 27 (M=14.6). On the one hand, this finding indicates that, for most part of the scales, there seems to be a sufficient number of items representing the typical characteristics of each dimension evaluated by the IDCP. On the other hand, for certain scales (e.g., impulsivity), it is possible that the formulation of new items might be necessary.

Another important fact regarding the validity of the instrument refers to descriptive statistics. As the IDCP attempts to operationalize disorders, its items tend to represent extreme versions of healthy personality characteristics. In a way, the values obtained on the descriptive statistics, means below 2.0 for 7 of the 12 dimensions (Table 4), are consistent with this explanation since the sample is predominantly composed of a non-clinical group. However, we should take a closer look at the dimensions of the items with the highest averages, Conscientiousness and Attention Seeking, contemplating attributes related to obsessive-compulsive disorder and histrionic disorder, once the literature presents data showing the difficulty in assessing the most pathological aspects of dimensions

related to typical characteristics of obsessive-compulsive and histrionic personality functioning (Hopwood, Thomas, Markon, Wright, & Krueger, 2012; Widiger, 2011).

In addition, another indicative of the adequacy of the internal structure for the IDCP is the reliability index, coefficient alpha. This index was satisfactory for almost all dimensions of the instrument, establishing .70 as the cutoff point. An exception to that was the Conscientiousness dimension, whose alpha coefficient was equal to .69.

We suggest the use of the final version found in this study consisting of 162 items (the sum of items from the factors is 176, but some items overlap in different dimensions). Future research should continue to evidence the validity of the IDCP, since the verification of the internal structure of the instrument is only a first step towards a more complete understanding of its functioning. We should also seek to optimize the reliability index (possibly adding new items) found for the Conscientiousness dimension, and verify how this dimension and the Attention-Seeking dimension actually assess pathological personality traits. Furthermore, the reliability indices of the factors that showed an uncertain coefficient (that is, close to .70) should be reviewed in future studies. We also suggest the use of the Item Response Theory (IRT), verifying possible impacts on the reliability of the scales due to discrepancies between the level of the latent trait measured by the instrument and the level of the latent trait of the sample.

An also important limitation of this study may guide the direction of future research using the IDCP. That is, the present sample consisted mainly of people without a diagnosis of personality disorders, and, considering the characteristics assessed by the instrument, it is important that further studies use samples predominantly with pathological personality traits.

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