RESEARCH

Open Access

CrossMark

Review of the self-sacrifice dimension of the dimensional clinical personality inventory

Lucas de Francisco Carvalho[*] and Giovana Fernanda Cassaro da Silva

Abstract

The present study aimed to review the Self-sacrifice scale from the Dimensional Clinical Personality Inventory (IDCP), and investigate its psychometric properties. To this end, the study comprised 199 participants, aging between 18 and 54 years ($M = 26.37$; $SD = 8.13$), and 142 were women (71.4 %). All subjects answered the IDCP and the Brazilian versions of the NEO Personality Inventory - Revised and the Personality Inventory for DSM-5 (PID-5). Based on the exploratory factor analysis with confirmatory indices (E-SEM), four interpretable factors were found, besides the total score for the scale reviewed. The factors showed adequate internal consistency coefficient ranging between .78 and .87. Furthermore, the correlations between the factors and the total score and the dimensions of the other instruments used were consistent, especially regarding to the PID-5. Accordingly, we conclude that the revised version size is more suitable adequate from the psychometric perspective compared to the original version, besides being more related to the pathological personality functioning.

Keywords: Personality traits, Psychometrics, Psychological tests

Background

In some cases, psychological functioning can be related to personality disorders (Millon et al. 2004; Millon 2011). A personality disorder can be construed as the representation of a pattern where the individual's personality cannot function properly in their environment. This can significantly impair living (Millon 1993; Widiger and Trull 2007; Millon et al. 2010). This definition supports findings in literature used to support the Diagnostic and Statistical Manual of Mental Disorders' Fifth Version ([DSM-5]; American Psychological Association 2003). According to Skodol et al. (2011), an individual is diagnosed with a personality disorder when they show significant self- (identity and self-directedness dimensions) and interpersonal (empathy and intimacy dimensions) functioning impairment.

In literature, there are various proposals for assessing typical personality disorder characteristics, one of which is Theodore Millon's proposal. Millon's theory offers a robust frame of reference for understanding personality and its disorders, as well as tools for measuring constructs (for further information, please see Millon 2011; Millon and Davis 1996; Millon et al. 2004; Millon and Grossman 2007a; 2007b; Millon et al. 2010). Based on Millon's proposal and DSM-IV-TR Axis II (American Psychological Association 2003), as well as the empirical support of a dimensional model (Schroeder et al. 1992), Carvalho and Primi (2015) developed the Dimensional Clinical Personality Inventory (*Inventário Dimensional Clínico da Personalidade* — IDCP). Particularly, the authors used Millon's pathological personality characteristics and DSM-IV-TR personality disorder diagnostic criteria as the basis for operationalizing the instrument's items.

IDCP is a self-report instrument for assessing pathological personality aspects consisting of 163 items divided in 12 dimensions, namely: Dependency, Aggressiveness, Mood Instability, Eccentricity, Attention Seeking, Mistrust, Grandiosity, Isolation, Avoidance of Criticism, Self-Sacrifice, Conscientiousness, and Impulsiveness. Each dimension is more closely related to one of Milton's pathological personality patterns (2011).

Carvalho and Primi (2015, in press) and Carvalho et al. (2014a) investigated IDCP's psychometric

* Correspondence: lucas@labape.com.br
Universidade Sao Francisco, Sao Paulo, Brazil

properties. Resulting data show acceptable reliability indexes (Nunnally 1978) and validity evidence based on internal structure (analuzed with Classical Test Theory and Item Response Theory) and external variables (psychiatric diagnoses and NEO-PI-R). However, despite the instrument's psychometric properties being acceptable, Carvalho and Primi (2015) have recommended the instrument be revised.

They specifically recommend revising particular aspects of certain dimensions. Some of these include the Conscientiousness (Carvalho et al. 2014c) and Attention Seeking (Carvalho et al. 2014b) dimensions, whose high selection rates suggest their items lean more towards assessing healthy characteristics instead of pathological characteristics. Additionally, Conscientiousness presented with an internal consistency (Cronbach's alpha) of 0.69, lower than 0.70, the cut-off point. Carvalho and Primi (2015) have also suggested continuous revision of all of the instrument's dimensions in order to further refine and update IDCP.

This study aims to fulfill that need, revising IDCP dimensions using procedures figured in the research papers cited (Carvalho et al. 2014c; Carvalho et al. 2014a, 2014b, 2014c) contributing to the instrument's continued revision and improvement. This study will focus on one of IDCP's dimensions, namely, Self-Sacrifice. This dimension includes a tendency to help others instead of oneself—and even to act in a detrimental fashion towards oneself, in favor of others (Carvalho and Primi 2015). According to the authors, this dimension's definition closely relates to masochist functioning. However, no empirical studies directly supporting these data have been found. In studies of correspondence between IDCP dimensions and psychiatric diagnoses (Carvalho and Primi in press) and in profile assessments of patients diagnosed with personality disorders (Abela 2013), there has been no data on the masochist personality disorder due to it not figuring in DSM-IV-TR Axis II (American Psychological Association 2003).

However, considering this disorder relates to significant impairment of self in favor of others (Millon 2011), correlation data between IDCP and NEO-PI-R facets shown by Carvalho and Primi (in press) have been consistent. It is also worth noting that correlation values to the Depressivity ($r = 0.37$), Embarrassment ($r = 0.31$), and Modesty ($r = 0.25$) facets have all been significant, which indicates that individuals scoring high in Self-Sacrifice tend to devalue themselves, see themselves as incapable, and not consider their own deeds relevant. Based on these data and the need for continuous improvement of IDCP dimensions, this research paper aims to revise the Self-Sacrifice dimension and confirm its new version's psychometric properties. We have also sought to establish factors for the Self-Sacrifice dimension, which

should make it possible to investigate different profiles according to this dimension's specific components.

Method
The method has been divided into two parts to better fit this study's objectives. Firstly (Part I), the Self-Sacrifice dimension review procedures are developed. Then (Part II), we present information on data collection for verifying the new dimension's psychometric properties.

Part I — Self-Sacrifice dimension revision
This study was divided into six phases to better fit its objectives. We point out that this research paper adopted the same sources used in previous studies, namely: DSM Fifth Edition's Section 3 ([DSM-5]; American Psychological Association 2013), Personality Inventory for DSM-5 ([PID-5]; Krueger et al. 2011) dimensions, Shedler-Westen Assessment Procedure ([SWAP]; Westen and Shedler 1999) dimensions, and Anna Clark's (1990) dimensions, included in the Schedule for Nonadaptive Personality (SNAP). However, these sources contain few of IDCP's Self-Sacrifice dimension typical elements. Due to that, we have also used references based on Millon's theory at first. The first phase consisted of literature review for verifying self-sacrifice construct-related characteristics based on Millon's theory. This review considered the Self-Sacrifice dimension to be intimately related to the masochist personality disorder. In other words, there is an excessive lack of concern for oneself (self) and excessive concern for others, evidently presenting along with tendencies to self-sacrifice and help others while doing oneself harm.

In the following phase, dimensions related to Self-Sacrifice were selected to be included in the study's models. Data were collected in a database of dimensions and their respective original characteristics in English, their version in Portuguese independently translated by this study's two authors, and a final consensual version. In the third phase, selected constructs were operationalized, i.e., new items for the Self-Sacrifice dimension were developed based on translated dimensions and selected constructs. In the fourth phase, researchers selected—first independently and then consensually—the items deemed more appropriate. As a result, we came to a set of selected items.

In the fifth phase, items were divided in categories according to their content. Then, still in this same phase, original items from the Self-Sacrifice dimension's original version were also divided in these categories. Thus, we were able to conduct a content comparison between original and new items. Finally, in the sixth phase, based on this previous comparison, new items for the final revised version were selected for the Self-Sacrifice dimension.

Part II — Verifying the Self-Sacrifice dimension's psychometric properties

Participants

This research included 199 subjects conveniently selected at a private university in the State of São Paulo and aged between 18 and 54 years old ($M = 26.37$; $SD = 8.13$), 142 of which were women (71.4 %). Most of the subjects had not yet graduated Higher Education (51.8 %) and another large portion of participants had already graduated High School (20.6 %). 10 % of subjects stated to have already underwent or to be currently undergoing psychiatric treatment and only 4.5 % of participants reported using this type of medication. Additionally, 31.2 % of subjects reported having already undergone psychological treatment and 11.6 % of them were still in psychotherapy.

Instruments

The Dimensional Clinical Personality Inventory, developed in 2011 by Carvalho and Primi, was used based on Millon's theory and DSM-IV-TR Axis II categories' diagnostic criteria. The instrument is comprised of 12 personality dimensions, namely: Dependency, Aggressiveness, Mood Instability, Eccentricity, Attention Seeking, Mistrust, Grandiosity, Isolation, Avoidance of Criticism, Self-Sacrifice, Conscientiousness, and Impulsiveness. Items are arranged in a 4-point Likert scale, 1 being 'Strongly Disagree' and 4 being 'Strongly Agree'. Average time for instrument completion is 25 min.

After administering the instrument, profiles were generated based on 12 personality dimensions. High scores suggest characteristics that gravitate towards pathological personality functioning (Carvalho and Primi 2015). As previously stated, IDCP's psychometric properties were verified (Carvalho and Primi 2015, in press; Carvalho et al. 2014a, 2014b, 2014c) and generally support this instrument's adequacy.

NEO-PI-R's Brazilian version was also used in this research (Costa and McCrae 2009). NEO-PI-R is a self-report inventory consisting of 240 items whose goal is to psychologically assess an adult individual's personality in five dimensions: Neuroticism, Extroversion, Openness to Experience, Agreeableness, and Conscientiousness. The instrument contains a 5-point Likert scale that goes from 'Strongly Disagree' (1) to 'Strongly Agree' (5). This study, however, only took the Neuroticism and Agreeableness dimensions into consideration. NEO-PI-R's completion time is approximately 30 min. The instrument's Brazilian version manual presents several studies that show acceptable validity evidence and reliability indexes (Costa and McCrae 2009).

Personality Inventory for DSM 5's Brazilian version was also administered (PID-5; Krueger et al. 2011). This instrument is a self-report inventory for assessing pathological personality characteristics consisting of 220 items that represent 25 facets (divided into 5 dimensions) that must be answered in a 4-point Likert scale (0 being 'Very False or Often False' and 3 being 'Very True or Often True'). PID-5 was developed in order to measure Criterion B, figuring in the current proposal for assessment of DSM-5 personality disorders. This study, however, only took the Depressivity and Submission dimensions into consideration.

Procedures

This study was first submitted to an Institutional Review Board and awarded a certificate of presentation for ethical consideration by a local ethics committee (which can be verified through the following protocol number: C.A.A.E. 21992113.1.0000.5514). Following its approval, the data collection phase took place. The instruments were collectively administered in classrooms in a single session for each class, taking 40 min on average for completion. They were also administered individually to participants who were not college students. First, this research study's goals were explained. After subjects had consented to be a part of the study, they signed an Informed Consent Form and answered the study's instruments.

After data collection, data were input in tables used for statistical analyses. Firstly, according to this study's goals, the number of factors to be considered for the exploratory factorial analysis was verified based on a parallel analysis (Hayton et al. 2004; Watkins 2006). For the analysis, R software version 2.15.3 was utilized, once it is compatible with the use of polychoric variables needed.

Based on this analysis, a MPlus software version 6.12 database was created for the exploratory factorial analysis with model adjustment indexes (Exploratory Structural Equation Modeling—E-SEM) and polychoric variables, in addition to obtaining adjustment indexes that indicated structure adequacy based on the study's population. It is also worth noting that adjustment indexes also suggest population adequacy. Data were compared to results presented by Carvalho and Primi (2015, in press). Lastly, factors chosen to comprise the revised Self-Sacrifice dimension were correlated to NEO-PI-R and PID-5's dimensions and their respective facets.

Results

In the first phase, as previously mentioned, DSM-5, PID-5, SWAP, and Clark's (1990) proposals were used. The adopted models generally do not include typical Self-Sacrifice characteristics or do include few of them. Due to that, we chose to revise Millon's theory according to its updated literature (Millon et al. 2010; Millon 2011). Self-Sacrifice is construed as a set of characteristics that relate to an excessive lack of concern for oneself (self),

evidently presenting along with tendencies to help others. This behavior is intimately related to a masochist or self-destructive personality disorder (American Psychological Association 2003; Millon 2011). No diagnostic categories typically related to this dimension were found in DSM-5 (American Psychological Association 2013). Out of PID-5's 25 facets, Depressivity and Submission facets were considered. This instrument assesses personality traits according to DSM's most recent version. Depressivity entails feelings of inadequacy, inferiority, emptiness, and lack of future perspective. Submission refers to the extent an individual is willing to self-negate to the benefit of others.

In SWAP, only the Dysphoria dimension was contemplated. It consists of items that indicate an individual's tendency to feel inferior, inadequate, prostrated, and to avoid social situations. In addition, in Clark (1990), characteristics related to the Self-Sacrifice dimension were selected from four different dimensions: Anhedonia, Self-Destructive, Passive-Aggressive, and Pessimism. Overall, aspects presented by Clark refer to lack or absence of the capacity to feel pleasure, devaluation of personal gain, lack of self-confidence, lack of interest for personal goals, influence of past experiences, and overstating difficulties. As previously mentioned, these models present few Self-Sacrifice-related dimensions. In phase 3, new items were established based on these proposals. A total of 189 items were established and distributed according to selected constructs.

In phase 4, out of 189 items, the ones considered to be more adequate were selected based on a consensus, resulting in 60 pre-selected items. In phase 5, items were divided into categories arbitrarily created by the authors to verify whether the they were representative of the dimension. Items from the dimension's original version were also included in this division. Categories are: Depressivity, referring to low mood, difficulty in finding meaning in life, negative self-image, and overstating difficulties; Submission/Self-Negation, containing items about an individual's need for satisfying others and putting them first; Anhedonia, containing items concerning an individual's difficulty in feeling pleasure; 'Self-Devaluation', consisting of sentences where the individual devalues personal gain; Self-Deprecation, including psychological suffering due to one's own actions; and Culpability, containing items regarding feeling guilty due to personal actions perceived as failures or mistakes.

Five items from the original dimension were included in the Submission/Self-Negation category and two of them were included in the Self-Deprecation category. These items were considered for the new pre-selected item set ($N = 60$). Thus, final selection consisted of 34 items, varying in five (Anhedonia and Self-Deprecation) to eight (Submission/Self-Negation) items. After completing this

phase, IDCP Self-Sacrifice dimension's final version was obtained, containing 7 original items and 34 new ones, coming to a total of 41 items.

Regarding empirical data, parallel analysis of polychoric variables resulted in four factors presenting not randomly obtained expressive Eigenvalues. Then, main components underwent analysis on MPlus software, forcing one-to-four-factor solutions, using an oblique Geomin rotation and a robust maximum likelihood (MLR) extraction method, considered to be an acceptable robust method for polychoric variables. Initially, adjustment indexes generated for all four models were analyzed. The most adequate adjustment index found was for a four-factor model, namely: $X^2/df = 1.86$ ($p < 0.001$) RMSEA = 0.071; CFI = 0.796; e, SMR = 0.050. Regarding cut-off points (Hooper et al. 2008), some indexes were considered good (X^2/df and SMR), one index was considered acceptable (RMSEA), and one index was considered to be poor (CFI). Based on these data, using a four-factor structure based on this study's population was deemed acceptable. Presenting factors with this model also produced the best interpretation possibilities, given its item set. Factor loadings, the number of items kept for each factor, and internal consistency indexes (Cronbach's alpha) can be seen in Table 1. Items kept for each factor are also bolded.

The Table shows a total of 18 items for the new Self-Sacrifice dimension. We purposefully sought to keep a minimum number of items by factor in order to make the instrument useable in the professional setting. Thus, even though some items presented acceptable factor loading, these were not included. Basically, four criteria were used for excluding items, namely: (a) Item impairs or has a negative impact on factor's internal consistency, (b) item presents too little of an interpretative consistency to be kept for the factor, (c) significant loadings in more than one factor (difference lower than 0.50 in intrafactor loadings), and (d) content redundancy among items of a same factor. Based on these criteria and on the general criterion of including the least possible amount of items, the dimension revised version set of items was obtained. It is worth pointing out that some of the excluded items could have been kept from a psychometric and content standpoint. However, considering the instrument's number of dimensions, an excessive number of items would make administering IDCP unfeasible. All factors presented factor variation from 0.70 to 0.87. The dimension was found to have a 0.89 index with the total set of 18 items. After defining the instrument's internal structure, the dimension's factors and its total score were related and compared to external variables. Table 2 shows factor correlation results and the revised Self-Sacrifice dimension's total score when compared to NEO-PI-R's two dimensions.

Table 1 Exploratory factorial analysis and internal consistency indexes

Item	Masochism	Depressivity	Hopelessness and Self-devaluation	Submission
69	0.52	0.29	0.16	0.26
125	0.51	0.33	0.31	0.36
149	0.58	0.15	0.25	0.37
204	0.69	0.32	0.35	0.30
366	0.39	0.69	0.54	0.33
367	0.36	0.76	0.61	0.32
369	0.19	0.84	0.56	0.33
372	0.42	0.19	0.21	0.33
373	0.30	0.47	0.45	0.51
374	0.33	0.33	0.25	0.48
375	0.62	0.29	0.38	0.46
376	0.38	0.17	0.27	0.78
377	0.36	0.29	0.29	0.86
380	0.26	0.84	0.590	0.28
385	0.34	0.57	0.79	0.31
387	0.32	0.55	0.85	0.25
394	0.21	0.50	0.72	0.37
396	0.24	0.55	0.68	0.39
# and α	6 (0.78)	4 (0.87)	4 (0.85)	4 (0.79)

Note: This Table figures only included items, making it visually clearer

All correlation values between the dimension's total score and its factors were significant and positive, with factor values varying from 0.36 to 0.74. The Table also presents correlation values between the new Self-Sacrifice dimension and two NEO-PI-R dimensions. All Neuroticism correlations were significant and positive, varying from 0.36 to 0.61. Agreeableness values were found to be generally low and to show some negative tendency, all of them being lower than 0.20. Revised dimension and factor/facet correlation values are presented below, in Table 3, in relation to Neuroticism and Agreeableness facets.

Values vary from 0.13 to 0.65. Total score relates more expressively to Depression and Self-Consciousness facets. The same is true for all Self-Sacrifice factors. Facets that related less to Self-Sacrifice factors were Impulsiveness

and Anxiety. Additionally, as previously verified, most relations between Self-Sacrifice and Agreeableness presented values lower than 0.20. The highest values shown were between Hopelessness & Self-Devaluation and Trust ($r = -0.34$), followed by Depressivity and Trust ($r = -0.31$). Hopelessness and Self-Devaluation is the Self-Sacrifice factor that showed the highest number of significant correlations with Agreeableness facets.

Then, PID-5's Depressivity and Submission dimensions were related to IDCP dimensions. All correlation values were shown to be statistically significant, varying mainly from moderate to high, from 0.31 (Masochism and Depressivity; Depressivity and Submission) and 0.77 (Hopelessness & Self-Devaluation and Depressivity). Total score presented similar correlation to both facets ($r = 0.66$ for Depressivity and 0.60 for Submission). Some

Table 2 Total score, factor and NEO-PI-R dimension correlation

	1	2	3	4	5	6	7
1 Masochism	1	0.36[**]	0.38[**]	0.45[**]	0.77[**]	0.40[**]	0.17[*]
2 Depressivity	0.36[**]	1	0.74[**]	0.37[**]	0.77[**]	0.55[**]	-0.14[*]
3 Hopelessness and Self-Devaluation	0.38[**]	0.74[**]	1	0.45[**]	0.80[**]	0.59[**]	-0.17[*]
4 Submission	0.45[**]	0.37[**]	0.45[**]	1	0.73[**]	0.36[**]	0.11
5 Total Score	0.77[**]	0.77[**]	0.80[**]	0.73[**]	1	0.61[**]	-0.02
6 Neuroticism	0.40[**]	0.55[**]	0.59[**]	0.36[**]	0.61[**]	1	-0.22[**]
7 Agreeableness	0.17[*]	-0.14[*]	-0.17[*]	0.11	-0.02	-0.22[**]	1

*$p = 0.05$ relevance; **$p = 0.01$ relevance

Table 3 Self-Sacrifice and Neuroticism/Agreeableness facets correlation

	Masochism	Depressivity	Hopelessness and Self-devaluation	Submission	Total score
Neuroticism facets					
Anxiety	0.25**	0.32**	0.35**	0.13	0.32**
Angry Hostility	0.27**	0.33**	0.40**	0.23**	0.43**
Depression	0.36**	0.64**	0.65**	0.33**	0.62**
Self-Consciousness	0.31**	0.47**	0.46**	0.40**	0.53**
Impulsiveness	0.27**	0.18**	0.24**	0.16*	0.30**
Vulnerability	0.28**	0.40**	0.45**	0.30**	0.45**
Agreeableness facets					
Trust	-0.05	-0.31**	-0.34**	-0.08	-0.27**
Straightforwardness	0.09	-0.01	0.01	0.01	0.02
Altruism	0.22**	-0.05	-0.17*	0.09	0.03
Compliance	0.12	-0.12	-0.09	0.14	0.00
Modesty	0.20**	0.10	0.16*	0.19**	0.22**
Tender-Mindedness	0.07	-0.11	-0.16*	0.06	-0.05

Self-Sacrifice factors (Depressivity [$r = 0.71$] and Hopelessness & Self-Devaluation [$r = 0.77$; $p = 0.01$]) were shown to more expressively relate to Depressivity. Other factors (Masochism [$r = 0.51$; $p = 0.01$] and Submission ($r = 0.53$; $p = 0.01$)) were more closely related to PID-5's Submission facet.

Discussion

Our first goal was to develop a new set of Self-Sacrifice dimension items that would also include original IDCP items (Carvalho and Primi 2015). We obtained 189 initial items from which 34 new items and 7 original items were selected for the instrument's final version. Categories created to better understand these items indicate their relation to typical Self-Sacrifice dimension characteristics, according to IDCP literature. For instance, some elements in PID-5 (Krueger et al. 2011), Clark (1990), and SWAP's (Westen and Shedler 1999) proposals are evidently related to the Depressivity category. In PID-5 and Millon's (2011) proposals, there are Submission/Self-Negation and Anhedonia-related elements. In PID-5, Clark, and Milllon's proposals we find correlation to Self-Devaluation and Self-Deprecation. In PID-5 and Clark's proposals, there are Culpability-related elements. Based on these data, the revised dimension was empirically investigated and four factors were found.

These factors are consistent with how literature—as previously mentioned—construes Masochism (tendency to help others more than oneself, including with self-detrimental behavior), Depressivity (tendency to have feelings of sadness and devaluation), Hopelessness and Self-Devaluation (believing one's own actions cannot result in a favorable outcome and self-blaming), and Submission (tendency to self-derogate in favor of others and

perceive other people to be better). On the one hand, there were no a priori expectations about the number of factors found. On the other hand, the set of items was considered to be interpretable and consistent with Self-Sacrifice aspects (Millon 2011)—such as a tendency to prioritize others and devalue oneself. These factors and the revised dimension's total score's internal consistency coefficients were considered acceptable (Embretson 1996; Nunnally 1978). This datum suggest that it is possible to use the Self-Sacrifice dimension with an acceptable room for measurement errors, i.e., construct assessment may be prioritized when applying this IDCP dimension.

The Self-Sacrifice dimension's final 18-item set—four of them from the original dimension—was internally and externally (to other instruments' dimensions and facets) correlated. The revised dimension's factor and total score correlations indicate, on the one hand, cohesion among factors—mainly regarding high values in total score correlations. On the other, they make it possible for individuals who present total scores in a same range (for instance, a high score) to have a distinct profile in the Self-Sacrifice dimension. The possibility of creating profiles inside IDCP dimensions has been proved in literature (Carvalho et al. 2014c; Carvalho et al. 2014a, 2014b, 2014c). I.e., it is possible for two individuals to score high in the dimension but still have different profiles due to its four factors. Considering that one of revising IDCP dimensions' main goals is to develop internal profiles for each dimension, this possibility can be considered favorable evidence of fulfilling this study's objectives.

Self-Sacrifice and Neuroticism factor values were also shown to be consistent, given that these values were

positive. This indicates that both factors converge in a similar range, i.e., a pathological range. Correlations with Agreeableness (all values lower than 0.20) indicate an absence of relation to this NEO-PI-R dimension, its revision, and its factors. Considering Self-Sacrifice aspects (Carvalho and Primi 2015)—regarding prioritizing others—and Agreeableness aspects (Costa and McCrae 2009)—regarding care and consideration for other people's wishes—, it was expected for the IDCP dimension's higher scores to be related to higher Agreeableness scores, which was not verified. However, due to each instrument's aim—IDCP assesses extreme pathological traits and NEO-PI-R assesses healthier traits—, the occurrence of opposite correlations would also have been coherent. Also, given that NEO-PI-R's dimension assesses healthier aspects and IDCP's dimension assesses pathological aspects, negative correlations could have been expected. In fact, both phenomena were observed in Agreeableness facets, as explained below.

To better understand these data, PID-5 facets were correlated to Agreeableness as an additional procedure mechanism. A similar pattern was observed: a -0.20 Depressivity correlation and a 0.12 Submission correlation. This datum suggests that aspects assessed by NEO-PI-R's Agreeableness dimension are not in line with typical Self-Sacrifice aspects, which could be expected. Future studies should investigate this issue further.

Specifically regarding Neuroticism facets and Self-Sacrifice variables, it is worth noting that some of IDCP dimension factors cannot be directly corresponded (for instance, Masochism and Submission). Other facets, such as Depressivity and Hopelessness & Self-Devaluation, present higher correlation values to the Depression facet. This is consistent with the fact that both facets relate to self-devaluation (Costa and McCrae 2009). Self-Sacrifice's total score was more expressively related to Depression and Self-Consciousness, which is consistent with Self-Sacrifice's subjacent sad mood, culpability, and submission components (Millon 2011). Regarding Agreeableness facets, Masochism presented more expressive and positive correlations to Altruism and Modesty. The NEO-PI-R facets suggest a tendency of thinking of other people's needs and not putting oneself above others (Costa and McCrae 2009), which is consistent with the intended assessment focus of IDCP's revised dimension. Submission also presented more expressive and positive correlation values to Modesty, indicating that this factor is partially related to a tendency of not putting oneself above others. Depressivity, however, correlated significantly and negatively to Trust. The same was true for Hopelessness and Self-Devaluation, suggesting that these two Self-Sacrifice factors are more related to depressive aspects and to difficulty in trusting others. This relation should be further investigated in future studies.

Lastly, PID-5 facets were the ones to show more expressive correlation values. This was expected, given that both the IDCP and PID-5 instruments were developed to assess pathological personality characteristics (Carvalho and Primi 2015; Krueger et al. 2011). These data can also be considered favorable to the Self-Sacrifice dimension. However, similarly to NEO-PI-R, PID-5 does not include any facets to specifically assess masochist functioning. Even so, IDCP's Masochism factor still presented higher correlation to the Submission facet. This is consistent with how significant submission is to a self-sacrificial functioning (Millon 2011). Additionally, Depressivity and Hopelessness & Self-Devaluation factors presented expressive correlation values with PID-5's Depressivity facet. As previously observed with NEO-PI-R, this is conceptually consistent with the fact that IDCP factors and this PID-5 facet include depressive aspects (Krueger et al. 2011). Correlation values between both the Submission factor and facet are also consistent, given that in both cases aspects assessed include the individual putting themselves after other people.

Conclusion

This study aimed to develop a new item set for IDCP's Self-Sacrifice dimension with adequate psychometric properties. Particularly, validity evidence was observed based on internal structure and external variables. Dimension and factor reliability indexes (internal consistency) were also verified. The revised dimension's high reliability coefficients and its relation to other instruments used suggest that this study's objective was reached and that the revised dimension proved to be more adequate than the original Carvalho and Primi (2015) one.

Regarding internal structure, we suggest the evidence presented favored the new Self-Sacrifice dimension, as four interpretable factors were observed according to proposals used as a basis for developing this dimension. Comparing IDCP's original dimension's score to the revised dimension's score, new item contents seem to contain more pathological characteristics than the original item set (please see NEO-PI-R and PID-5 correlations), which was expected and required given that the instrument assesses pathological personality characteristics. Additionally, it is worth pointing out that each factor could have consisted of a higher number of items, from a psychometric standpoint. However, we sought to keep the number of items per factor to a minimum in order to make the instrument useable in the clinical setting.

This study also included limitations that must be stated. The first of these limitations relates to population: the number of participants and their characteristics. Future studies should aim to replicate diverse groups and their structure, particularly including patients

diagnosed with personality disorders. Additionally, when replicating these factors, it is paramount that reliability indexes be confirmed based on the level of subjects in the latent construct, for instance, through local precision (Daniel 1999). We also suggest investigating the use of this revised dimension in the clinical setting.

References

Abela, R.K. (2013). *Evidências de validade para o Inventário Dimensional Clínico da Personalidade (IDCP) com base nos perfis de participantes com diagnóstico psiquiátrico*. Dissertação de Mestrado, Universidade Federal de São Paulo – Escola Paulista de Medicina, São Paulo, SP

American Psychological Association. Manual Diagnóstico e Estatístico de Transtornos Mentais DSM-IV-TR (4ª ed.). Porto Alegre: Artmed; 2003.

American Psychological Association. (2013). *American Psychiatric Association DSM-5*

Carvalho LF, Primi R. Development and internal structure investigation of the dimensional clinical personality inventory. Psicologia: Reflexão e Crítica. 2015;28(2):322–30.

Carvalho, L. F., & Primi, R. (no prelo). Prototype matching of personality disorders with the Dimensional Clinical Personality Inventory. Psicologia: *Teoria e Pesquisa*.

Carvalho LF, Primi R, Stone GE. Psychometric properties of the Inventário Dimensional Clínico da Personalidade (IDCP) using the Rating Scale Model. Avances en Psicología Latinoamericana. 2014a;32(3):433–46.

Carvalho LF, Sette CP, Capitão CG, Primi R. Propriedades psicométricas da versão revisada da dimensão necessidade de atenção do inventário dimensional clínico da personalidade. Temas em Psicologia. 2014b;22(1):147–60. doi:10.9788/TP2014.1-12.

Carvalho LF, Souza BDB, Primi R. Psychometric properties of the revised conscientiousness dimension of Inventário Dimensional Clínico da Personalidade (IDCP). Revista de Psiquiatria do Rio Grande do Sul. 2014c; 36(1):23–31. doi:10.1590/2237-6089-2013-0024.

Clark LA. Toward a consensual set of symptom clusters for assessment of personality disorder. Advances in personality assessment. New Jersey: La wrence Erlbaum associates; 1990.

Costa Jr PT, McCrae RR. NEO-PI-R - Inventário de Personalidade NEO Revisado - Manual. São Paulo: Vetor; 2009.

Daniel MH. Behind the scenes: Using new measurement methods on the DAS and KAIT. In: Embretson SE, Hershberger SL, editors. The new rules of measurement: What every psychologist and educator should know. Mahwah, NJ: Lawrence Erlbaum; 1999. p. 37–63.

Embretson SE. The new rules of measurement. Psychol Assess. 1996;8(4):341–9. doi:10.1037/1040-3590.8.4.341.

Hayton JC, Allen DG, Scarpello V. Factor retention decisions in exploratory factor analysis: a tutorial on parallel analysis. Organ Res Methods. 2004;7(2):191–205. doi:10.1177/1094428104263675.

Hooper D, Coughlan J, Mullen MR. Structural equation modelling: guidelines for determining model Fit. EJBRM. 2008;6(1):53–60.

Krueger RF, Derringer J, Markon KE, Watson D, Skodol AE. Initial construction of a maladaptive personality trait model and inventory for DSM-5. Psychol Med. 2011;42(9):1879–90. doi:10.1017/S0033291711002674.

Millon T. Personality Disorders: Conceptual distinctions and classification issues. In: Costa PT, Widiger TA, editors. Personality Disorders and the Five-Factor Model of Personality. Washington, DC: American Psychiatry Association; 1993. p. 671–712.

Millon T. Disorders of Personality: introducing a DSM/ICD spectrum from normal to abnormal. New Jersey: Wiley; 2011.

Millon T, Davis RD. Disorders of Personality DSM-IV and Beyond. New Jersey: Wiley; 1996.

Millon, T. & Grossman, S. (2007a). Moderating severe personality disorders. John Wiley & Sons Inc., New Jersey

Millon, T. & Grossman, S. (2007b). *Overcoming resistant personality disorders*. John Wiley & Sons Inc., New Jersey

Millon, T., Grossman, S. & Tringone, R. (2010). The Millon Personality Spectrometer: a tool for personality spectrum analyses, diagnoses, and treatments. Em: Millon, T., Krueger, R. F., & Simonsen. (Orgs.), *Contemporary directions in psychopathology: scientific foundations of the DSM-V and ICD-11*, The Guilford Press, New York.

Millon T, Millon CM, Meagher S, Grossman S, Ramanath R. Personality Disorders in Modern Life. New Jersey: Wiley; 2004.

Nunnally JC. Psychometric theory. New York: McGraw-Hill; 1978.

Schroeder ML, Wormworth JA, Livesley WJ. Dimensions of personality disorder and their relationships to the Big Five dimensions of personality. Psychol Assess. 1992;4(1):47–53. doi:10.1037//1040-3590.4.1.47.

Skodol AE, Clark LA, Bender DS, Krueger RF, Livesley WJ, Morey LC, et al. Proposed changes in personality and personality disorder assessment and diagnosis for DSM–5, Part I: Description and rationale. Personal Disord. 2011;2(1):4–22. doi:10.1037/a0021891.

Watkins MW. Determining parallel analysis criteria. J Mod Appl Stat Methods. 2006;5(2):344–6.

Westen D, Shedler J. Revising and assessing Axis II, Part I: Developing a clinically and empirically valid assessment method. Am J Psychiatr. 1999;156(2):258–72.

Widiger TA, Trull TJ. Place tectonics in the classification of personality disorder: shifting to a dimensional model. Am Psychol. 2007;62(2):71–83.