# Assessment of personality disorder in the ICD-11 diagnostic system: Polish validation of the Personality Inventory for ICD-11

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## Summary

**Aim**. This paper presents results of a study on the Polish adaptation of the Personality Inventory for ICD-11 (PiCD), which was developed to measure pathological traits under a new, dimensional model of personality disorders proposed in ICD-11.

**Method**. The study involved a non-clinical sample of $N$ = 597 adults (51.4% female; $M_{age}$ = 30.24 years, $SD$ = 12.07 years). For convergent and divergent validity, Personality Inventory for DSM-5 (PID-5) and Big Five Inventory-2 (BFI-2) were used.

**Results**. The results showed the Polish adaptation of the PiCD to be reliable and valid. Cronbach's alpha coefficient for PiCD scale scores ranged from 0.77 to 0.87 ($M\alpha$ = 0.82). The four-factor structure of PiCD items with the three unipolar factors, "Negative Affectivity", "Detachment", and "Dissociality", and one bipolar "Anankastia" vs. "Disinhibition" factor was conformed. All PiCD traits are related to PID-5 pathological traits and BFI-2 normal traits in an expected way both in correlational and factor analyses.

**Conclusions**. Obtained data demonstrate satisfactory internal consistency, factorial validity, and convergent-discriminant validity of the Polish adaptation of PiCD in a non-clinical sample.

**Key words**: personality disorders, ICD-11, PiCD

## Introduction

Authoritative classification systems for psychopathology, that is, the DSM-5 [1] and ICD-11 [2], significantly differ from their previous versions in the way they conceptualize personality disorders. Both have been shifting from categorical towards

dimensional approaches. This is a huge paradigm change that has already been supported by theoretical reasoning and much empirical evidence, and has far-reaching clinical implications. In the case of the ICD-11, putting forward a fully dimensional classification, relying on trait-based personality research and theory, provides scientifically sound and homogenous building blocks of personality psychopathology but also clinical information for selecting the focus of treatment [3, 4]. In this paper, we present a Polish validation of the self-report Personality Inventory for ICD-11 (PiCD) [5] developed to measure the pathological dimensions of personality.

Personality disorder (PD) is important to all health care providers because it is a widespread condition that applies to approximately 12% of the general adult population [6] and at least 40% of psychiatric outpatients [7]. The 11th edition of the ICD [2] has set out to make a profound change to the diagnosis, assessment, and classification of PD, providing a significant step towards building an empirically driven and theoretically justified PD diagnostic system.

The ICD-11 based diagnosis is composed of one general personality disorder severity rating, five maladaptive personality trait domains, and an additional borderline pattern qualifier [4, 8]. In the first step, the level of severity of personality dysfunction in terms of the overall features is assessed (i.e., none, personality difficulty, and mild, moderate, and severe personality disorder, with the threshold for PD diagnosis in at least mild severity) [2]. In the second step, the dysfunctional personality structure is specified in terms of severity across five maladaptive trait-domains: Negative Affectivity, Detachment, Dissociality, Disinhibition, and Anankastia (see Figure 1). Notably, in contrast to DSM-5 [1], WHO [2] has avoided a hybrid approach by dropping PD categories (nosological entities) and having (a) just a single dimension of severity for all personality dysfunctions, ranging from non-disordered personality at one end to severe personality disorder at the other [see 3, 4] and (b) profile of five maladaptive traits. The overall severity of PD reflects the degree to which the prominent trait-domains (one or more) have an impact on the patient's self and interpersonal functioning.

Thus, it broadly reduces the excessive comorbidity that characterizes the categorical system by allowing for individuals with complex personality pathology to be conceptualized by their domain profiles rather than by a list of PD diagnoses (that still only rarely, even collectively, provide a complete clinical picture of one's personality pathology). It is worth noting that the retention of the borderline descriptor is an exception from the dimensional approach, which is not part of the evidence-based model but whose removal was rejected by supporters of the old borderline terminology [for a discussion, see 4]. As such, a clinician who feels that the severity – domain system is insufficient has the option of using a borderline pattern descriptor.

Taking into account the ICD-11's five trait domain qualifiers and their combinations, the number of diagnostic constellations provides an opportunity for a detailed clinical conceptualization. Moreover, the level of severity assessment equips practitioners with important information about the level of risk, prognosis, and needed treatment

intensity, and it also provides a metric for the assessment of change that is general to all individuals with a PD [3].

The ICD-11 maladaptive traits can be assessed by the Personality Inventory for ICD-11 [5]. It is a 60-item self-report measure designed to assess the dimensional model containing the five broad ICD-11 maladaptive trait domains described in Table 1. The PiCD has shown adequate reliability, structural and discriminant validity [5, 9], as well as good concurrent validity with the Big Five model, the five maladaptive trait domains of the DSM-5 Alternative Model of Personality Disorder (AMPD), and other personality psychopathology models [9-14].

Table 1. **Trait domains in the ICD-11 classification of personality disorders and sample items from the PiCD for each domain**

| Domain | The core features | Common manifestations and the PiCD item sample |
|---|---|---|
| Negative Affectivity | A tendency to experience a broad range of negative emotions with an intensity and frequency disproportionate to a situation. | Traits in this domain include emotional lability and poor emotion regulation, negativistic attitudes, mistrustfulness, low self-esteem and self-confidence.<br>Sample item: "I am usually an anxious person". |
| Detachment | A tendency to maintain interpersonal distance (social detachment) and emotional distance (emotional detachment), manifested in social withdrawal, indifference to people, and isolation, including avoidance of not only intimate relationships but also close friendships. | Traits in this domain include avoidance of social interactions, lack of friendships, avoidance of intimacy, aloofness, and limited emotional expression and experiences.<br>Sample item: "I prefer to stay away from other people". |
| Dissociality | A tendency to disregard social obligations, conventions, and the rights and feelings of others, ruthlessness in obtaining one's goals. | Traits in this domain include self-centeredness (e.g., sense of entitlement, attention-seeking, and expectation of others' admiration) and lack of empathy (e.g., manipulative, being exploitative of others, callousness, hostility, and aggression).<br>Sample item: "My anger has gotten me into fights". |
| Disinhibition | A persistent tendency to act recklessly based on immediate (external or internal) stimuli without consideration of potentially harmful consequences. | Traits in this domain include impulsivity, distractibility, irresponsibility, recklessness, and lack of planning.<br>Sample item: "I tend to act impulsively". |

| Domain | The core features | Common manifestations and the PiCD item sample |
|---|---|---|
| Anankastia | It reflects a narrow focus on one's rigid standard of perfection and/or of right and wrong, and on controlling one's own (and others') behavior to ensure conformity to the individual's particularistic ideal. | Traits in this domain include perfectionism (e.g., orderliness, concern with following rules and meeting norms and obligations, scrupulous attention to detail) and emotional and behavioral constraint (e.g., rigid control over emotional expression, stubbornness, inflexibility, perseveration, and deliberativeness). Sample item: "I spend a large amount of time organizing and making arrangements". |

*Note*. Adapted from the ICD-11 Clinical Descriptions and Diagnostic Guidelines for Personality Disorder, which include a detailed description of each trait domain [2, 15].

Relations of the ICD-11 model to the normal Big Five/Five-Factor Model (FFM) and already existing pathological Big Five (AMPD from DSM-5) are of special importance. The alternative DSM-5 model [1] proposes five personality traits that are maladaptive variants of all traits distinguished in the FFM. The ICD-11 does not include Psychoticism in line with the long-established notion that schizotypal characteristics are regarded as a part of the spectrum of schizophrenia, rather than a personality disorder [2]. In turn, ICD-11 encompasses Anankastia to the catalogue of maladaptive traits as the obsessive-compulsive tendencies are of crucial clinical importance because it constitutes the most prevalent PD [6]. As a result, two maladaptive trait-domains in ICD-11 are related to both extreme poles of FFM's Conscientiousness: Anankastia (high Conscientiousness) and Disinhibition (low Conscientiousness). The relations between FFM with five normal personality traits and two pathological Big Fives (ICD-11 and DSM-5) are presented in Figure 1.

The consequences of including maladaptive variants of both poles of Conscientiousness is that research on the factor structure of the PiCD has shown two possible models. Factor analyses of the 60 items have yielded comparably acceptable fit for both the four-factor and five-factor models [cf. 5, 9-11, 13, 16], suggesting, however, that the four-factor model can be considerably more interpretable and meaningful. From a conceptual perspective, Disinhibition and Anankastia domains clearly constitute the opposite extreme poles of the same dimension, namely Conscientiousness, and as a result, these domains seem best captured in terms of a (fourth) bipolar Anankastia-Disinhibition factor. The four-factor solution with the three unipolar factors Negative Affectivity, Detachment, and Dissocial domains, and the fourth factor as a bipolar continuum – with one pole defined by the Anankastia domain and at the other pole by the Disinhibition domain – actually better aligns with the conceptualization of the personality domains encompassed within the ICD-11 PD model [4, 17, cf. 2] and also has a stronger theoretical and empirical justification than the five-factor solution [9-14, 18-23; for a review, see 24]. Relatedly, although the ICD-11 PD domain model describes 5 domains, the five-factor solution seems less conceptually sound relative to the four-factor solution.
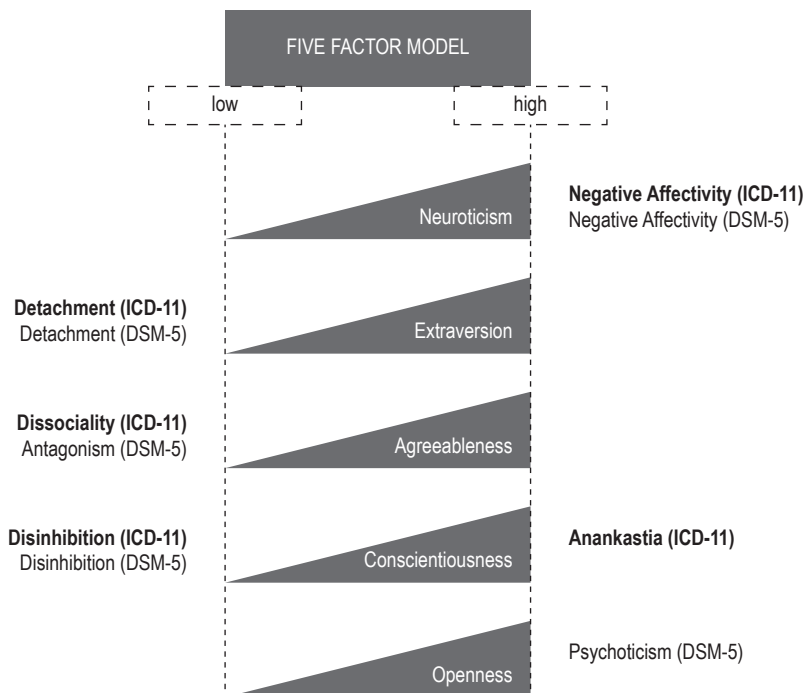
Figure 1. **Graphical representation of conceptual and structural alignment between ICD-11, DSM-5, and FFM trait domains**

## Research hypotheses

The aim of the present study is to provide basic psychometrics of the Polish version of the PiCD. We expected specifically to confirm the following psychometric features:

(1) The four-factor structure of the Polish version of PiCD with three unipolar factors as Negative Affectivity, Detachment, and Dissociality factors, and one bipolar Anankastia vs. Disinhibition factor. Item-level Exploratory Structural Equation Modelling (ESEM) was used to assess the model fit for the expected four-factor structure of the PiCD items as was done by Oltmanns and Widiger [5]. ESEM is a very appealing approach as it allows a priori hypotheses about structural validity (confirmatory measurement model part with access to all the usual SEM parameters) to be tested, but still allows for benefits of the presence of cross-loading estimates (exploratory measurement model part) [25]. We used oblique target rotation and targeted each cross-loading to be close to zero. We expected the appropriate item loadings on factors and acceptable fit indices: RMSEA < .08 and SRMR < .05. Similar to Oltmanns and Widiger [5], we expected CFI would be set below the threshold of .90 because of the large number of items.

(2) Internal consistency of all scales. This hypothesis was tested using Cronbach's alpha coefficient. In line with Oltmanns and Widiger [5, 9] we expected Cronbach's alpha values ≥ 0.70.

(3) Convergent-discriminant validity of the scales. We assessed the relationships between the PiCD scales and normal Big Five (FFM) traits, as well as dysfunctional personality traits from the (AMPD) DSM–5 using correlational and factorial analysis. In terms of correlations, the PiCD Negative Affectivity domain was expected to show a positive relationship with Neuroticism; negative relations of Detachment and Dissociality with Extraversion and Agreeableness, respectively, and positive relation of Anankastia and negative relation of Disinhibition with Conscientiousness. In a similar way, the five PiCD domain scales were assumed to show convergent validity with four PID-5 scales – namely, PiCD Negative Affectivity and PID-5 Negative Affectivity; PiCD Detachment and PID-5 Detachment; PiCD Dissociality and PID-5 Antagonism; and, finally, it was expected that PiCD Disinhibition and PID-5 Disinhibition would be correlated positively, whereas PiCD Anankastia and PID-5 Disinhibition negatively. For discriminant validity, the absolute values of the correlations between PiCD domains and conceptually dissimilar PID-5 and BFI-2 domains were expected to be relatively smaller in magnitude than the convergent validity correlations. In terms of factor analysis, we expected that the joint factor analysis of the five ICD-11 traits with four DSM-5 traits (without Psychoticism) and four traits from FFM (without Openness) would produce a four-factor solution defined as: (a) Neuroticism (FFM) and Negative Affectivity from both ICD-11 and DSM-5, (b) Extraversion (FFM) and Detachment from both ICD-11 and DSM-5; (c) Agreeableness (FFM), Dissociality (ICD-11) and Antagonism (DSM-5), and (d) Conscientiousness (FFM), Disinhibition from both ICD-11 and DSM-5, and Anankastia (ICD-11).

## Method

### Participants and procedure

We administered the PiCD with validation measures in two moderately large samples of Polish adult participants. Participants in Sample 1 were 242 adults and Sample 2 consisted of 355 adults from central Poland. All analyses were run on the combined sample of $N = 597$ adults (51.4% female; $M_{age} = 30.24$ years, $SD_{age} = 12.07$ years). The research was conducted using a self-report paper-and-pencil method, with the assistance of trained psychology students – each of them administered the measures to approximately 6–10 respondents chosen from a pool of their distant relatives, friends, and acquaintances. Participation was entirely voluntary and anonymous. In both samples, we administered both PiCD and a questionnaire to measure the pathological Big Five according to the DSM-5 (AMPD). Additionally, participants in Sample 1 also completed an inventory to assess the normal Big Five personality traits. The research

was conducted in compliance with the recommendations of the Commission of Ethics and Bioethics at the Cardinal Stefan Wyszyński University in Warsaw.

## Measures

### Personality Inventory for ICD-11 (PiCD)

The PiCD [5] is a 60-item self-report measure designed to assess five broad personality domains of the ICD-11 described in Table 1. Each domain contains 12 items rated on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

### Personality Inventory for DSM-5 (PID-5)

The PID-5 [26, Polish adaptation: 27] is a 220-item self-report measure capturing 25 pathological trait-facets across five trait-domains according to AMPD (Criterion B) of the DSM-5 [1]. Items are rated on a 4-point Likert scale from 0 (*very false or often false*) to 3 (*very true or often true*). The PID-5 has been found to show good psychometric properties across clinical and non-clinical samples [e.g., 21, 26, 28]. In the current research only five domain-level scales were used, i.e., Negative Affectivity, Detachment, Antagonism, Disinhibition and Psychoticism, and their Cronbach's alpha coefficients ranged from 0.89 to 0.95 ($M\alpha = 0.93$).

### Big Five Inventory-2 (BFI-2)

The BFI-2 [29] was used to assess the normal Big Five (FFM) personality traits. It is a 60-item self-report measure designed to assess five trait-domains: Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness as well as their 15 facets, which were not used in the current study. Each trait-domain scale contains 12 items rated on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). In the current research, their Cronbach's alpha coefficients ranged from 0.82 to 0.90 ($M\alpha = 0.87$).

## Results

Descriptive statistics (i.e., means and standard deviations), reliability estimates for PiCD trait dimensions, and correlation coefficients with validation measures are presented in Table 2. Cronbach's alpha coefficient for PiCD scale scores ranged from 0.77 to 0.87 ($M\alpha = 0.82$). Overall, the reliability estimates were adequate and comparable with estimates obtained by Oltmanns and Widiger [5].

Table 2. **Descriptive statistics, reliability estimates, and correlations among the PiCD, PID-5, and BFI-2 scales**

| Scale | PiCD NA | PiCD DT | PiCD DL | PiCD DN | PiCD AK | PID-5 NA | PID-5 DT | PID-5 AN | PID-5 DN | PID-5 PS | BFI-2 N | BFI-2 E | BFI-2 A | BFI-2 C | BFI-2 O | M (SD) | α |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PiCD NA | - | | | | | | | | | | | | | | | 2.79 (0.65) | 0.87 |
| PiCD DT | .22 | - | | | | | | | | | | | | | | 2.20 (0.60) | 0.84 |
| PiCD DL | .15 | .16 | - | | | | | | | | | | | | | 2.06 (0.55) | 0.81 |
| PiCD DN | .37 | .17 | .40 | - | | | | | | | | | | | | 2.16 (0.57) | 0.83 |
| PiCD AK | .13 | .17 | -.05 | -.48 | - | | | | | | | | | | | 3.26 (0.49) | 0.77 |
| PID-5 NA | **.77** | .22 | .25 | .39 | .13 | - | | | | | | | | | | 1.10 (0.38) | 0.94 |
| PID-5 DT | **.50** | **.68** | .27 | .26 | .15 | **.65** | - | | | | | | | | | 0.73 (0.41) | 0.94 |
| PID-5 AN | .29 | .05 | **.73** | .42 | -.04 | **.52** | .38 | - | | | | | | | | 0.76 (0.44) | 0.95 |
| PID-5 DN | .17 | -.02 | .32 | **.70** | **-.59** | .25 | .14 | .40 | - | | | | | | | 1.21 (0.34) | 0.89 |
| PID-5 PS | .43 | .20 | .40 | .43 | -.02 | **.62** | **.52** | **.57** | .39 | - | | | | | | 0.70 (0.48) | 0.94 |
| BFI-2 N | **.74** | .26 | -.02 | .32 | .07 | **.66** | **.50** | .15 | .08 | .27 | - | | | | | 2.77 (0.74) | 0.90 |
| BFI-2 E | -.37 | **-.63** | .27 | -.08 | -.14 | -.32 | **-.54** | .21 | .10 | -.11 | **-.50** | - | | | | 3.41 (0.71) | 0.90 |
| BFI-2 A | -.18 | -.23 | **-.56** | -.35 | .13 | -.26 | -.30 | **-.53** | -.24 | -.35 | -.30 | .08 | - | | | 3.70 (0.52) | 0.82 |
| BFI-2 C | -.26 | -.15 | -.19 | **-.66** | .29 | -.27 | -.24 | -.29 | **-.53** | -.36 | -.35 | .20 | .43 | - | | 3.66 (0.66) | 0.88 |
| BFI-2 O | -.14 | -.30 | .08 | -.03 | .02 | -.17 | -.28 | .09 | .05 | .01 | -.19 | .43 | .09 | -.01 | - | 3.71 (0.59) | 0.84 |

*Note.* PiCD – Personality Inventory for ICD-11, NA – Negative Affectivity, DN – Disinhibition, DT – Detachment, DL – Dissociality, AK – Anankastia; PID-5 – Personality Inventory for DSM-5, NA – Negative Affectivity, DT – Detachment, AN – Antagonism, DN – Disinhibition, PS – Psychoticism; BFI-2 – Big Five Inventory-2, N – Neuroticism, E – Extraversion, A – Agreeableness, C – Conscientiousness, O – Openness. Given the large sample size, attention was paid to effect size rather than to statistical significance. Moderate effect size correlations (i.e., $|.30 –.49|$) are italicized, large effect sizes (i.e., $\geq |.50|$) are in bold. Correlations greater than $|.10|$ are significant at $p < .05$ (two-tailed). Correlation analysis with the BFI-2 scales was conducted on a subsample of $N = 242$, and correlations greater than $|.12|$ are significant at $p < .05$ (two-tailed).

In order to replicate the factor structure of the PiCD in the Polish sample, an ESEM of the 60 items of the PiCD with the robust maximum likelihood estimation method (MLR) was applied using *Mplus* version 8.1. A four-factor solution was suggested to be an optimal fit taking into account the scree plot (see Figure 2). Robust fit indices for the four-factor target ESEM model suggested adequate model fit: $\chi^2 = 3488.38$, $df = 1536$, $p < .001$; RMSEA = .046, 90% CI [.044, .048]; SRMR = .041, TLI = .79, and CFI = .814. Notably, our RMSEA, SRMR, and CFI values were comparably better than what was found in the original paper by Oltmanns and Widiger [5], where their RMSEA value was .065, SRMR value was .047, and CFI was .779.

Standardized factor loadings ($\lambda$s) and factor intercorrelations for the four-factor ESEM model are shown in Table 3.
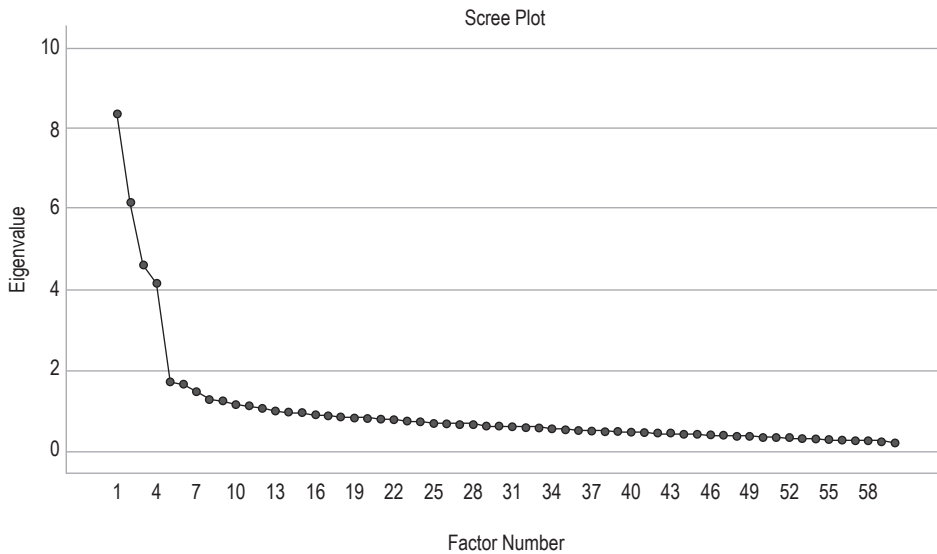


Figure 2. **Scree plot of principal axis factoring in the factor analysis of 60 PiCD items**

Table 3. **Standardized factor loadings and factor intercorrelations for the four-factor ESEM model for PiCD at the item level ($N = 597$)**

| Item | Factor | | | |
|------|------|------|------|------|
|      | NA | DT | DL | AN/DN |
| NA1 | **.57** | *.48* | | |
| NA6 | **.56** | | | .32 |
| NA11 | **.64** | .23 | .28 | |

*table continued on the next page*

| | | | |
|------|------|------|------|
| NA16 | **.55** | .25 | .24 | |
| NA21 | **.51** | .32 | | |
| NA26 | .32 | .21 | .22 | |
| NA31 | .44 | | | |
| NA36 | **.62** | .29 | | |
| NA41 | **.66** | .33 | .26 | |
| NA46 | **.51** | .40 | | |
| NA51 | .44 | .40 | .25 | |
| NA56 | **.67** | .29 | .33 | |
| DT3 | | **.66** | | |
| DT8 | -.24 | **.51** | | |
| DT13 | | **.69** | | |
| DT18 | | .38 | | |
| DT23 | -.33 | .22 | | |
| DT28 | | **.72** | | |
| DT33 | | **.71** | | |
| DT38 | | .43 | | |
| DT43 | | **.73** | | |
| DT48 | | .41 | .27 | |
| DT53 | -.34 | .26 | | |
| DT58 | | **.71** | | |
| DL4 | | | .40 | |
| DL9 | | .23 | .43 | |
| DL14 | | -.27 | .48 | |
| DL19 | | | **.51** | |
| DL24 | | | .35 | |
| DL29 | | | **.53** | |
| DL34 | | | **.58** | |
| DL39 | | | **.53** | |
| DL44 | | | **.65** | |
| DL49 | | -.22 | .42 | |
| DL54 | | | .49 | |
| DL59 | | | **.62** | |
| DN2 | .45 | | .45 | -.21 |

*table continued on the next page*

| | | | |
|---|---|---|---|
| DN7 | | .33 | .29 | -.48 |
| DN12 | | .34 | | **-.57** |
| DN17 | | | .38 | **-.54** |
| DN22 | | .28 | .32 | -.22 |
| DN27 | | .35 | .26 | **-.55** |
| DN32 | .24 | | .31 | -.49 |
| DN37 | | .24 | .33 | -.21 |
| DN42 | | .32 | | **-.53** |
| DN47 | | | .35 | -.50 |
| DN52 | | | .32 | -.32 |
| DN57 | | .25 | | -.39 |
| AN5 | | | | **.53** |
| AN10 | | .38 | | |
| AN15 | | | | **.63** |
| AN20 | | | .23 | .48 |
| AN25 | | .25 | | .39 |
| AN30 | -.21 | .29 | .21 | .30 |
| AN35 | | | .24 | **.54** |
| AN40 | .33 | | | .32 |
| AN45 | | | | **.67** |
| AN50 | | -.22 | | .29 |
| AN55 | | | | **.56** |
| AN60 | | | | .47 |
| NA | - | | | |
| DT | -.16 | - | | |
| DL | -.07 | -.01 | - | |
| AN/DN | -.08 | .14 | -.01 | - |

*Note*. NA = Negative Affective factor; DT = Detachment factor; DL = Dissocial factor; AN/DN = Anankastia/Disinhibition factor. Factor loadings ≥ |.20| are shown. Factor loadings ≥ |.30| are italicized, and factor loadings ≥ |.50| are bolded. Factor intercorrelations ≥ |.08| are significant at *p* < .05 (two-tailed).

For the Negative Affectivity factor: (a) the median absolute λ for Negative Affectivity items was .558, (b) 12/12 items had medium to large λs, and (c) 2/12 Detachment items, 1/12 Disinhibition item, and 1/12 Anankastia item had medium cross-loadings (≥|.30|). For the Detachment factor: (a) the median absolute λ for Detachment items was .583, (b) 10/12 items had medium to large λs, and (c) 5/12 Negative Affectivity

items, 4/12 Disinhibition items, and 1/12 Anankastia item had medium cross-loadings. For the Dissocial factor: (a) the median absolute λ for Dissocial items was .500, (b) 12/12 Dissocial items had medium to large λs, and (c) 7/12 Disinhibition items and 1/12 Negative Affectivity item had medium cross-loadings. For the Disinhibition/Anankastia factor: (a) the median absolute λ for Disinhibition and Anankastia items was .479, (b) 19/24 items had medium to large λs, and (c) 1/12 Negative Affectivity item cross-loaded (λ = .321). Summarizing, in the four-factor solution (see Table 3) nearly all PiCD items (52/60) loaded primarily on their expected domains with only one serious deviation. One Anankastia item (AN10) did not load on the expected factor to an acceptable extent (λ = .142) and obtained its primary loading on the Detachment factor.

In regard to the convergent and discriminant validity, we expected to replicate the pattern of correlational associations reported in previous studies. Analyses showed (see Table 2) that the PiCD Negative Affectivity was most strongly correlated with BFI-2 Neuroticism and PID-5 Negative Affectivity. The PiCD Detachment, Dissociality, and Disinhibition domains were shown convergent validity, as expected, with BFI-2 Extraversion/PID-5 Detachment, BFI-2 Agreeableness/PID-5 Antagonism, and BFI-2 Conscientiousness/PID-5 Disinhibition, respectively. Notably, the PiCD Anankastia was correlated basically only with PID-5 Disinhibition ($r = -.59$) and BFI-2 Conscientiousness ($r = .29$).

With respect to discriminant validity, there were no large effect size relationships for any correlation coefficient among the PiCD scales. The largest absolute correlation was between Disinhibition and Anankastia ($r = -.48$); however, a strong negative correlation of these domains is theoretically predicted and justified. The median absolute value of the PiCD scales intercorrelations was .17, thus suggesting that broadly, these scales are only slightly related and represent relatively separate and distinct domains. With respect to the validation measures, all of the discriminant validity correlations were lower than the convergent with the PID-5 and the BFI-2, with small to medium effect sizes (see Table 2). With one exception, the correlation between PiCD Negative Affectivity and PID-5 Detachment was larger in magnitude than should be expected; however, it is understandable, given the common facets (and items) of Detachment and Negative Affectivity within PID-5 [26, 27].

Finally, to examine the structural relationships of the PiCD, the PID-5, and the BFI-2 (FFM) scales, a joint exploratory principal factor analysis with a varimax rotation was conducted. Varimax rotation was used as a method that minimizes the number of variables that have high loadings on each factor and simplifies the interpretation of the factors. A four-factor solution was suggested as being an optimal fit (the first five eigenvalues were 4.526, 2.782, 1.581, 1.203, and 0.726). The first four factors explained jointly 78% of the variance. Table 4 provides the four-factor pattern loading matrix which emphasizes the contribution of each scale to a given factor.

Table 4. **Domain-level exploratory factor analysis of the PiCD, PID-5, and BFI-2 scales**

| Domain | Factor | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| PiCD Negative Affective | **.85** | | | |
| PID-5 Negative Affectivity | **.83** | .32 | | |
| BFI-2 Neuroticism | **.78** | | | .24 |
| PiCD Dissociality | | **.89** | | |
| PID-5 Antagonism | .23 | **.84** | .22 | |
| BFI-2 Agreeableness | | **-.50** | -.29 | |
| PID-5 Disinhibition | | .28 | **.72** | |
| PiCD Disinhibition | .28 | .27 | **.72** | |
| BFI-2 Conscientiousness | -.26 | | **-.70** | |
| PiCD Anankastia | .23 | | **-.63** | |
| PiCD Detachment | | | | **.90** |
| BFI-2 Extraversion | -.35 | .30 | | **-.72** |
| PID-5 Detachment | .49 | .30 | | **.63** |

*Note*. PiCD – Personality Inventory for ICD-11, PID-5 – Personality Inventory for DSM-5, BFI-2 – Big Five Inventory-2. Factor loadings ≥ |.20| are shown. Factor loadings ≥ |.30| are italicized. Factor loadings ≥ |.50| are bolded.

Specifically, Factor 1 was primarily defined by PiCD Negative Affectivity, PID-5 Negative Affectivity, and Neuroticism (BFI-2); Factor 2 by PiCD Dissociality and PID-5 Antagonism, with a negative loading by Agreeableness (BFI-2); Factor 3 by PiCD and PID-5 Disinhibition, with negative loadings by PiCD Anankastia and Conscientiousness (BFI-2); Factor 4 by PiCD and PID-5 Detachment, along with a negative loading by Extraversion (BFI-2).

## Discussion

The ICD-11 PD model [2] is provided to make a major change in the way in which personality disorders are conceptualized and diagnosed, by going towards a fully dimensional model. The purpose of the study was to provide cross-cultural evidence for the reliability and validity of the PiCD developed as an operationalization of the five domains of the ICD-11 maladaptive personality trait model [5]. Evaluating the psychometric properties of the PiCD in other languages and cultural contexts is particularly important considering that the ICD is the public-health-focused authoritative classification system used worldwide. Our findings suggest that the Polish version of the PiCD represents a reliable and construct-valid measure of the ICD-11 model of trait-domains.

Each scale of the PiCD was estimated to have adequate internal consistency (reliability), as indexed by Cronbach's alpha. To replicate the structural validity of the PiCD, a four-factor item-level ESEM model was estimated. With respect to conventional cut-off criteria, the hypothesized four-factor solution had an adequate fit, reflecting three factors consistent with Negative Affectivity, Detachment, and Dissocial trait domains, and a fourth factor consistent with a bipolar continuum of Anankastia vs. Disinhibition. Specifically, 87% of the PiCD items obtained their primary loading on their domain. This four-factor loading pattern matrix was broadly similar to the loadings obtained by Oltmanns and Widiger [5] and in recent studies on PiCD suggesting a four-factor model with Disinhibition and Anankastia located as the opposite poles of a single dimension [5, 9, 10, 13; for a review, see 24]. Notably, one strength of our analyses is that they were conducted at the item-level as opposed to using parcel/subscale sum/mean scores as indicators of higher-order factors because of the large number of items [for a discussion, see 30], which is arguably a stronger test of the factorial structure of a given measure and can possibly better identify sources of model misspecification.

A four-factor solution structure was expected for the PiCD, even though the ICD-11 PD model includes five trait domains. Perhaps one could have expected a five-factor model, given the presence of five distinct domains within the ICD-11 trait model. On that point, it should be noted that the results concerning the bipolar structure of the Disinhibition vs. Anankastia domains are in line with research investigating the structure of the PiCD [see 24], as well with the conceptualization of the trait domains within the ICD-11 PD model and research indicating a negative relationship between traits of compulsivity and traits of disinhibition [e.g., 18-23]. Of note, Tyrer et al. [4, p. 492] plainly stated that "negative affectivity is linked with high neuroticism, detachment with low extraversion, disinhibition with low conscientiousness, dissociality with low agreeableness, and anankastia with high conscientiousness". As such, the authors of the ICD-11 trait model do appear to recognize that Anankastia and Disinhibition are opposite poles of the same dimension, but do not make this point explicitly [see 8, 9]. Indeed, consistent with the ICD-11 theoretical foundation [4, 17], as well as with previous evidence [e.g., 20, 22], the current study showed that PiCD Anankastia and Disinhibition correlated in opposite directions with BFI-2 Conscientiousness and within the factor analyses loaded in opposite directions on the same factor. Overall, the item-level factor analysis and joint factor analysis of the PiCD with the PID-5 and BFI-2 scales both exhibited the expected four-factor structure of the PiCD consisting of Negative Affectivity, Detachment, and Dissociality factors, and a bipolar Anankastia vs. Disinhibition factor.

One more critical point on the PiCD factor structure and its interpretation is also worth recognizing. The four-factor structure with one bipolar factor does not preclude the interpretation of five PiCD domains, as bipolarity does not contradict the presence of distinguishable trait domains. Anankastia and Disinhibition, though constituting a bipolar factor, each showed the unique and distinct patterns of conceptually consist-

ent relations with FFM dimensions and other PiCD domains. Given these and other lines of evidence [see e.g., 24, 31], based on the PiCD scales the most suitable (and approachable for clinicians) is coding one to five of the ICD-11 trait qualifiers.

Corresponding to the structural validity, hypotheses regarding convergent and discriminant validity of PiCD scales have obtained clear empirical support. The over-all pattern of associations with validation measures was congruent with expectations based on prior studies [e.g., 5, 9, 13] and supports the validity of the Polish adaptation of the PiCD. Convergent correlations for the PiCD with the BFI-2 and PID-5 scales showed mostly large effect sizes (e.g., strong convergence of PiCD Negative Affec-tivity with BFI-2 Neuroticism and PID-5 Negative Affectivity; strong convergence of PiCD Detachment with BFI-2 Extraversion and PID-5 Detachment; and PiCD Anankastia converged positively with BFI-2 Conscientiousness and negatively with PID-5 Disinhibition). Notably, the current research obtained support for the validity of the relationship of the PiCD with the BFI-2 assessing normal personality traits of the FFM. Although the convergence did not always achieve large effect size relation-ships (i.e., Anankastia showed a minor correlation with Conscientiousness, $r = .29$), this is to be expected for the convergence of pathological to normal personality traits. Overall, these findings are thus consistent with the broader view that the ICD-11 trait domains can be seen as extreme and/or maladaptive variants of normal personality traits [4, 5, 9, 13, 17].

With respect to discriminant validity, there were no large effect size relationships for any correlation coefficient among the PiCD scales (except the assumed medium-large correlation between Anankastia and Disinhibition). Also, with respect to the other validation measures, all of the discriminant validity correlations were lower than the convergent, with small to medium effect size relationships. Of note, the results lay in stark contrast with the problematic discriminant validity shown by the PID-5 assess-ment of the DSM–5 trait model as was apparent with respect to the intercorrelations, and correlations with FFM traits as well, which to date has been broadly evidenced, i.e., not only in the current study [for a meta-analysis, see 32, 33; see also 13].

While the present research has several important strengths, it also has limita-tions. Although the present analyses utilized a large sample, the results should be replicated and extended to other samples, also those exhibiting clinical symptomatol-ogy. In this regard, it is important to replicate the present results and also examine other psychometric characteristics of the PiCD (e.g., measurement invariance) in both clinical and community samples. In addition, each measure administered in the present research relied on self-reports, and therefore, the relations between scale scores were to some extent inflated due to shared method variance. The recently tested informant version of the PiCD [see 12, 32] could be used in future studies to provide multimethod support for the validity and also to examine agreement between self – and other-reports.

In closing, our findings support the internal consistency, factor structure, and convergent-discriminant validity of the PiCD, examined in a large community sample

of Polish adults. The PiCD thus proved to be adequate in the Polish version, although more research is needed in various samples to further evaluate its validity. We hope that availability of the Polish version will make such research possible.

# References

1.  American Psychiatric Association. *Diagnostic and statistical manual of mental disorders – 5th Edition*. Washington, D.C.: APA; 2013.

2.  World Health Organization. *ICD-11, the 11th Revision of the International Classification of Diseases.* 2020. https://icd.who.int/en (cited 2021 Mar 29).

3.  Bach B, First MB. *Application of the ICD-11 classification of personality disorders*. BMC Psychiatry. 2018; 18(1): 351.

4.  Tyrer P, Mulder R, Kim Y-R, Crawford MJ. *The development of the ICD-11 classification of personality disorders: An amalgam of science, pragmatism, and politics*. Annu. Rev. Clin. Psychol. 2019; 15(1): 481–502.

5.  Oltmanns JR, Widiger TA. *A self-report measure for the ICD-11 dimensional trait model proposal: The personality inventory for ICD-11*. Psychol. Assess. 2018; 30(2): 154–169.

6.  Volkert J, Gablonski T-C, Rabung S. *Prevalence of personality disorders in the general adult population in Western countries: Systematic review and meta-analysis*. Br. J. Psychiatry. 2018; 213(6): 709–715.

7.  Beckwith H, Moran PF, Reilly J. *Personality disorder prevalence in psychiatric outpatients: A systematic literature review*. Personal. Ment. Health. 2014; 8(2): 91–101.

8.  Reed GM, First MB, Kogan CS, Hyman SE, Gureje O, Gaebel W et al. *Innovations and changes in the ICD-11 classification of mental, behavioural and neurodevelopmental disorders*. World Psychiatry. 2019; 18(1) :3–19.

9.  Oltmanns JR, Widiger TA. *Evaluating the assessment of the ICD-11 personality disorder diagnostic system*. Psychol. Assess. 2019; 31(5): 674–684.

10. Carnovale M, Sellbom M, Bagby RM. *The Personality Inventory for ICD-11: Investigating reliability, structural and concurrent validity, and method variance*. Psychol. Assess. 2020; 32(1): 8–17.

11. Crego C, Widiger TA. *The convergent, discriminant, and structural relationship of the DAPP-BQ and SNAP with the ICD-11, DSM-5, and FFM trait models*. Psychol. Assess. 2020; 32(1): 18–28.

12. Oltmanns JR, Widiger TA. *The self – and informant-personality inventories for ICD-11: Agreement, structure, and relations with health, social, and satisfaction variables in older adults*. Psychol. Assess. 2021; 33(4): 300–310.

13. McCabe GA, Widiger TA. *A comprehensive comparison of the ICD-11 and DSM-5 section III personality disorder models*. Psychol. Assess. 2020; 32(1): 72–84.

14. Somma A, Gialdi G, Fossati A. *Reliability and construct validity of the Personality Inventory for ICD-11 (PiCD) in Italian adult participants*. Psychol. Assess. 2020; 32(1): 29–39.

15.  Tyrer P, Reed GM, Crawford MJ. *Classification, assessment, prevalence, and effect of personality disorder*. Lancet. 2015; 385(9969): 717–726.

16.  Gutiérrez F, Aluja A, Ruiz J, García LF, Gárriz M, Gutiérrez-Zotes A et al. *Personality disorders in the ICD-11: Spanish validation of the PiCD and the SASPD in a mixed community and clinical sample*. Assessment. 2021; 28(3): 759–772.

17.  Mulder RT, Horwood J, Tyrer P, Carter J, Joyce PR. *Validating the proposed ICD-11 domains*. Personal. Ment. Health. 2016; 10(2): 84–95.

18.  Anderson JL, Sellbom M, Bagby RM, Quilty LC, Veltri COC, Markon KE et al. *On the convergence between PSY-5 domains and PID-5 domains and facets: Implications for assessment of DSM-5 personality traits*. Assessment. 2013; 20(3): 286–294.

19.  Crego C, Widiger TA. *Convergent and discriminant validity of alternative measures of maladaptive personality traits.* Psychol. Assess. 2016; 28(12): 1561–1575.

20.  Skodol AE. *Personality disorders in DSM-5*. Annu. Rev. Clin. Psychol. 2012; 8(1): 317–344.

21.  Thomas KM, Yalch MM, Krueger RF, Wright AGC, Markon KE, Hopwood CJ. *The convergent structure of DSM-5 personality trait facets and five-factor model trait domains*. Assessment. 2013; 20(3): 308–311.

22.  Widiger TA, Simonsen E. *Alternative dimensional models of personality disorder: Finding a common ground*. J. Pers. Disord. 2005; 19(2): 110–130.

23.  Wright AGC, Simms LJ. *On the structure of personality disorder traits: Conjoint analyses of the CAT-PD, PID-5, and NEO-PI-3 trait models*. Personal. Disord. 2014; 5(1): 43–54.

24.  Oltmanns JR. *Personality traits in the International Classification of Diseases 11th Revision (ICD-11)*. Curr. Opin. Psychiatry. 2021; 34(1): 48–53.

25.  Asparouhov T, Muthén B. *Exploratory structural equation modeling*. Struct. Equ. Modeling. 2009; 16(3): 397–438.

26.  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. 2012; 42(9): 1879–1890.

27.  Rowiński T, Kowalska-Dąbrowska M, Strus W, Cieciuch J, Czuma I, Żechowski C et al. *Measurement of pathological personality traits according to the DSM-5: A Polish adaptation of the PID-5. Part II – empirical results*. Psychiatr. Pol. 2019; 53(1): 23–48.

28.  Zimmermann J, Kerber A, Rek K, Hopwood CJ, Krueger RF. *A brief but comprehensive review of research on the Alternative DSM-5 Model for Personality Disorders*. Curr. Psychiatry Rep. 2019; 21(9): 92.

29.  Soto CJ, John OP. *The next Big Five Inventory (BFI-2): Developing and assessing a hierarchical model with 15 facets to enhance bandwidth, fidelity, and predictive power*. J. Pers. Soc. Psychol. 2017; 113(1): 117–143.

30.  Marsh HW, Lüdtke O, Nagengast B, Morin AJS, Von Davier M. *Why item parcels are (almost) never appropriate: Two wrongs do not make a right—camouflaging misspecification with item parcels in CFA models*. Psychol. Methods. 2013; 18(3): 257–284.

31.  Bach B, Christensen S, Kongerslev MT, Sellbom M, Simonsen E. *Structure of clinician-reported ICD-11 personality disorder trait qualifiers*. Psychol. Assess. 2020; 32(1): 50–59.

32.  Watters CA, Bagby RM. *A meta-analysis of the five-factor internal structure of the Personality Inventory for DSM-5*. Psychol. Assess. 2018; 30(9): 1255–1260.

33.  Watters CA, Bagby RM, Sellbom M. *Meta-analysis to derive an empirically based set of personality facet criteria for the alternative DSM-5 model for personality disorders*. Personal. Disord. 2019; 10(2): 97–104.

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