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RESEARCH ARTICLE

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Measuring maladaptive personality traits with the Structured Clinical Interview for DSM-IV Axis II Screening Questionnaire using a common metrics approach

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Abstract

The classification of personality disorder (PD) is undergoing a paradigm shift in which categorically defined specific PDs are being replaced by dimensionally defined maladaptive trait domains. To bridge the classificatory approaches, this study attempts to use items from the categorical PD model in DSM-IV to measure the maladaptive trait domains described in DSM-5 Section III/ICD-11. A general population sample comprising 1228 participants completed the Screening Questionnaire of the Structured Clinical Interview for DSM-IV Axis II (SCID-II-SQ), the Personality Inventory for DSM-5 (PID-5), and the anankastia scale of the Personality Inventory for ICD-11 (PiCD). Using item response theory models and a psychometric linking technique, SCID-II-SQ items were evaluated for their contribution to measuring maladaptive trait domains. The best discriminating items were then selected to derive proxy scales. We found that convergent validity of these proxy scales was in a similar range to that of other self-report measures for PD, except for the proxy scale for PiCD anankastia. However, only the proxy scale for negative affectivity showed acceptable reliability that would allow its application in research settings. Future studies should seek to establish a common metric between specific PDs and maladaptive trait domains using self-report measures with higher specificity or semi-structured interviews.

INTRODUCTION

The transition from a categorical to a dimensional classification of personality disorders (PDs) in the DSM-5 (American Psychiatric Association [APA], 2013) and the ICD-11 (World Health Organization [WHO], 2022) represents a major paradigm shift that is arguably "the most radical change in the personality disorders classification history" (Tyrer et al., 2019, p. 1). At the heart of this change is that individual differences in the expression of

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PD are no longer represented by a list of categorically defined disorders (e.g., borderline PD) but rather by allowing each person to exhibit an individual profile of maladaptive trait domains. Such a radical change raises the question of how continuity between systems can be established, given that decades of research have been based on the specific PDs listed in the DSM-III (APA, 1980) and its successors. Therefore, an empirically grounded algorithm that is capable of translating assessments of specific PDs into assessment of maladaptive trait domains can be useful in preserving existing data for reanalysis in accordance with a dimensional perspective. In clinical practice, practitioners could use assessment of specific PDs to approximate maladaptive trait ratings. The aim of this study is to develop such a transformation algorithm using item response theory (IRT) models. In particular, we investigated whether it is possible to use items from the Screening Questionnaire of the Structured Clinical Interview for DSM-IV Axis II (SCID-II-SQ; First et al., 1997) for measuring DSM-5 and ICD-11 maladaptive trait domains.

Maladaptive personality trait domains in AMPD/ICD-11

A central element of both the Alternative Model for Personality Disorders (AMPD) in DSM-5 Section III and the classification of PD in ICD-11 are models of maladaptive personality traits that represent the empirical structure of individual differences in PD expressions. The AMPD trait model is included as Criterion B within the general criteria for PD and consists of 25 trait facets that are organized into five higher-order trait domains (Krueger et al., 2012). Fifteen of the trait facets are considered to load primarily on one particular domain and are therefore regarded as core facets (Krueger et al., 2012; Watters & Bagby, 2018). The five trait domains (with their three core facets in parentheses) are negative affectivity (NA; emotional lability, anxiousness, and separation insecurity), detachment (DET; withdrawal, anhedonia, and intimacy avoidance), antagonism (ANT; manipulativeness, deceitfulness, and grandiosity), disinhibition (DIS; irresponsibility, impulsivity, and distractibility), and psychoticism (PSY; unusual beliefs and experiences, eccentricity, and perceptual dysregulation). In recent years, it has been confirmed that the domains represent maladaptive variants of the domains of the five-factor model of personality (McCrae & Costa, 1987), possibly with the exception of the PSY domain (Zimmermann et al., 2019). The AMPD further retained six specific PDs (i.e., schizotypal, antisocial, borderline, narcissistic, avoidant, and obsessive-compulsive PD) that are described by specific combinations of maladaptive traits and functional impairments (Morey & Skodol, 2013).

In the ICD-11 model, five personality trait qualifiers (NA, DET, dissociality, DIS, and anankastia [AN]) can be coded for describing the most prominent characteristics of an individual's personality that contribute to personality disturbance. Bach et al. (2018) could demonstrate that the ICD-11 and the AMPD trait domains are corresponding in terms of NA, DET, DIS, and ANT/dissociality, which suggests that findings on these trait domains can be applied to both PD models. Whereas the ICD-11 defines a distinct AN domain, the DSM-5 AMPD model conceptualizes AN and DIS to be opposite poles of the same continuum (Krueger et al., 2012; McCabe & Widiger, 2020). Importantly, the AN domain was not defined in particular detail in early draft versions of the ICD-11 PD model (Tyrer et al., 2015). This led to various facet level operationalizations of AN in different measures that aim to assess the ICD-11 trait domain. For example, Kerber et al. (2022) developed the PID-5-Brief-Form-Plus (PID5BF+) to assess AN according to Bach et al. (2017), using the DSM-5 trait facets rigid perfectionism and perseveration. Bach et al. (2020) then developed a modified version of the PID5BF+ (PID5BF+M) by omitting the perseveration facet and differentiating rigid perfectionism into a perfectionism, orderliness, and rigidity facet. Finally, it should be noted that the ICD-11 considers PSY as part of schizophrenia disorders and thus does not specify it as a PD trait qualifier (Bach & First, 2018).

Associations between specific PDs and AMPD/ICD-11 maladaptive traits

In the development of the AMPD and ICD-11 PD model, a concerted effort has been made to fully capture the content of the preceding specific PDs. For example, the AMPD defines six configurations of the trait facets depicted in Criterion B for diagnosis of the six retained specific PDs in a trait-to-disorder mapping listed in the DSM-5 (APA, 2013; Morey & Skodol, 2013). More recently, Watters et al. (2019) examined correlations between the AMPD trait facets and the six PDs included in the AMPD in a meta-analysis of 25 independent samples (37 correlation matrices). They observed good convergent validity for the proposed trait facet profiles for each PD, except for obsessive-compulsive PD. For the ICD-11, Simon et al. (2023) provided a review of current research on associations between ICD-11 maladaptive trait domains and specific PDs. Across nine independent samples, they found that DET was most strongly associated with avoidant PD and schizoid PD; NA with

borderline PD, avoidant PD, and dependent PD; dissociality (i.e., ANT) with antisocial PD and narcissistic PD; DIS with antisocial PD and borderline PD; and AN with obsessive-compulsive PD. The reported correlation coefficients between specific PDs and maladaptive traits on both the domain- and facet-level highlight the continuity between the two PD models. Moreover, empirical investigations using multiple regression analyses found that maladaptive traits could account for substantial variance in criterion counts of specific PDs (Miller et al., 2018). For example, regression models predicting dimensional scores of specific PDs through self-reported maladaptive trait domain scores achieved 25–50% explained variance, with the highest explained variance found for borderline PD and lowest for histrionic and obsessive-compulsive PD (Few et al., 2013; Fossati et al., 2013). Studies that systematically investigate the coverage of individual PD criteria by maladaptive traits are still scarce. Rojas and Widiger (2017) investigated how well criteria of six specific PDs (antisocial, avoidant, borderline, dependent, and narcissistic and obsessive-compulsive PD) could be predicted by maladaptive trait facet scores. They found good coverage for most criteria of the investigated PDs, except for obsessive-compulsive PD. In contrast, Liggett and Sellbom (2018) found that six of the eight obsessive-compulsive PD criteria could be strongly predicted by trait facet scores. Bach and Sellbom (2016) similarly predicted borderline PD criteria through maladaptive trait facets and observed good coverage, except for criterion 7 (*chronic emptiness*).

Common metrics approach

To estimate individual levels of maladaptive trait domains using data on DSM-IV PDs, several methodological strategies are conceivable (e.g., mapping techniques based on different regression approaches; Elleman et al., 2020; Gamst-Klaussen et al., 2018). In this paper, we rely on the common metrics approach (Fischer & Rose, 2016; Wahl et al., 2014), in which a latent measurement model is developed for each maladaptive trait domain and then items on DSM-IV PDs are selected that contribute reliable information within this measurement model. This is possible through the use of IRT, which postulates that observable, manifest variables such as item responses are influenced by one or more unobservable, latent variables (Embretson & Reise, 2000). Defining the relationship between these manifest variables and a latent variable allows one to draw conclusions about an individual's level of this latent variable irrespective of the set of manifest variables (i.e., measure) used. In such an approach, measures belonging to the DSM-IV PD model could then be used to estimate individual trait scores of the trait domains (latent variables) as featured in the AMPD and ICD-11. In practice, the common metric can then be applied by clinicians or researchers either by using crosswalk tables or by directly estimating individual trait scores through IRT model parameters (Fischer & Rose, 2016). Successful past applications of common metrics approaches include the integration of various self-report scales for PD severity (Zimmermann et al., 2020), depression (Wahl et al., 2014), and distress (Batterham et al., 2018).

The present study

This study aimed to explore whether a common metrics approach can be used to develop algorithms for transforming assessments of DSM-IV PDs into the maladaptive trait domains in the DSM-5 AMPD/ICD-11. For this purpose, data from the SCID-II-SQ were analysed in conjunction with data from self-report measures of AMPD and ICD-11 maladaptive trait domains. The SCID-II-SQ was used because it is part of the SCID-II, which is the APA's official diagnostic interview that is widely applied in both research and clinical practice. Employing bifactor graded response models, we defined trait domains according to the AMPD, using the Personality Inventory for DSM-5 (PID-5; Krueger et al., 2012) and two operationalizations of ICD-11 AN, using the Personality Inventory for ICD-11 (PiCD; Oltmanns & Widiger, 2018) and rigid perfectionism items from the PID-5. Afterwards, a linking technique previously used by Wahl et al. (2014) was applied to estimate how informative the SCID-II-SQ items were for assessing the general factor of each AMPD and ICD-11 trait domain. Per domain, the most informative SCID-II-SQ items were then selected to establish proxy scales that were maximally related to the AMPD and ICD-11 domain operationalizations.

METHOD

Sample

The present study is based on data from Zimmermann et al. (2023). Controlled quota sampling was used within a German panel provided by Respondi to obtain an approximately representative sample of the German general population in terms of age and gender. We used the same $N = 1228$ participants as Zimmermann et al. (2023), after excluding 406 participants who had an indication for careless responding based on instructed response items or page time. Participants (50.5% female)

ranged in age from 18 to 74 years ($M = 49.1$, $SD = 15.1$). Within this range, the sample was approximately representative of the German adult population in terms of gender and age (see Supplementary Table S1 in Zimmermann et al., 2023); 1134 participants (92.3%) reported being native speakers, and 623 participants (50.7%) had at least a specialized high school diploma ("Fachabitur").

Measures

Personality Inventory for DSM-5 (PID-5)

The PID-5 (Krueger et al., 2012; German version: Zimmermann et al., 2014) is a 220-item self-report measure that assesses the five maladaptive trait domains and their 25 facets of Criterion B according to the DSM-5 AMPD. The trait facet scales comprise 4–14 items each. Items are rated on a 4-point scale ranging from 0 (*very false*) to 3 (*very true*). Higher values reflect higher levels of personality pathology after reverse coding of 16 items. Domain scores are calculated by averaging the three core facets of each trait domain (Krueger et al., 2012; Watters & Bagby, 2018). We further used six rigid perfectionism items to assess AN in accordance with the PID5BF+M operationalization (PID5BF+M-AN; Bach et al., 2020).

Structured Clinical Interview for DSM-IV Axis II Disorders – Screening Questionnaire (SCID-II-SQ)

The SCID-II-SQ (First et al., 1997; German version: Fydrich et al., 1997) is a 117-item self-report screening questionnaire, assessing criteria for each specific PD listed in the DSM-IV except antisocial PD. Participants are presented with questions regarding their personality that are either confirmed (1) or rejected (0) with reference to the last 5–10 years. In the present study, the 15 items assessing criteria related to conduct disorder symptoms in childhood and adolescence were omitted. Note that the SCID-II-SQ includes items for assessing negativistic and depressive PD, which were omitted in DSM-5 Section II.

Anankastia Scale of Personality Inventory for ICD-11 (PiCD-AN)

We used the 12-item AN scale of the PiCD (Oltmanns & Widiger, 2018; German version: Damovsky et al., 2023), with items rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The items cover the facets of perfectionism, risk aversion, and deliberativeness.

Software and open practices

Analyses were conducted in the statistical platform R version 4.2.0 (R Core Team, 2022), focusing on the mirt package (Chalmers, 2012) for estimating IRT models. Data, study materials, and R code are publicly available in our Open Science Framework repository: https://osf.io/ba37m/.

Statistical analyses

In the IRT models, item parameters were estimated using the Metropolis–Hastings Robbins–Monro (MH-RM; Cai, 2010) algorithm adopting default settings.[1] Model fit was evaluated based on collapsed M2* limited information statistic (Cai & Hansen, 2013) and multiple derivatives, including the root mean square error of approximation (RMSEA), the standardized root mean squared residual (SRMR), the comparative fit index (CFI), and the Tucker–Lewis index (TLI). As a rough guideline for judging good fit, we used the cutoff values from the simulations of Hu and Bentler (1999; RMSEA < 0.06, SRMR < 0.08, CFI > 0.95, TLI > 0.95). Factor scores (theta estimates) for each person were estimated using the expected a-posteriori (EAP) method. For each of the seven trait domain operationalizations, we first established separate measurement models. We then linked SCID-II-SQ items to the individual trait domain models and selected the most discriminating items to create trait domain proxy scales.

Establishing measurement models for maladaptive trait domains

In the first step, we used confirmatory bifactor analysis to establish measurement models for maladaptive trait domains as the target construct. A bifactor model is useful for defining a domain as the shared variance of the facets (i.e., the general factor) and distinguishing it from the unique variance of the facets (i.e., the specific

[1]Newton-Raphson optimizer consists of only one update. Maximum number of MHRM cycles: 2000. Number of burning cycles: 150. Number of stochastic EM cycles: 100. Metropolis–Hasting draws at each iteration: 5.

factors). We estimated seven separate bifactor models with one general and three specific factors. Because the items have an ordinal 4- or 5-point response format, we used graded response models (Samejima, 1969). Five models followed the PID-5 mapping of facets to each domain. Two additional models were estimated: one following the three facets of the AN domain as operationalized in the PiCD and the other following the three facets in the PID5BF+M operationalization of AN. In that way, we established seven measurement models in which the targeted trait domain (e.g., DIS) was modeled as general factor, and additional covariation was captured in the specific factors representing the trait facets (e.g., irresponsibility, impulsivity, and distractibility). The estimated item parameters (slopes and intercepts) of each bifactor model were extracted for further analysis.

Linking SCID-II-SQ items to maladaptive trait domains

In the second step, we evaluated whether the SCID-II-SQ items provide reliable information for assessing maladaptive trait domains. For this purpose, we built on the previously extracted parameters of the PID-5 and PiCD items, including only the slope and intercept parameters of the general factor and omitting the parameters of the specific factors. This corresponds to a simplification of the bifactor model with respect to a one-dimensional measurement model. We fixed these item parameters during model estimation to ensure that the target constructs (i.e., maladaptive trait domains) were anchored over the following analysis steps, in which we carried out a procedure outlined by Wahl et al. (2014). For each of the seven maladaptive trait domain models, we estimated 102 new models, each time including one of the 102 SCID-II-SQ items. Because SCID-II-SQ items have a dichotomous response format, we used 2PL models for this process (Lord & Novick, 1968). Only the item parameters of the SCID-II-SQ items were freely estimated and were extracted for further analysis. The resulting slope parameters can provide information on whether the SCID-II-SQ items are suitable for discriminating between individuals with high and low scores in the respective maladaptive trait domains.

Developing SCID-II-SQ proxy scales for maladaptive trait domains

In the third step, a new maximally informative proxy scale was constructed for each trait domain, using the most discriminating SCID-II-SQ items. The starting cutoff value for the slopes was set at 1.3 following the approach by Wahl et al. (2014).[2] If less than eight items showed a slope ≥ 1.3, the value was decreased until at least eight items per scale could be retained. For each domain, we defined a one-dimensional 2PL model, including only these items and using the item parameters extracted from the models of the previous linking step. Local independence of these models was examined using the Q_3 statistic, which represents the correlation between item pairs after the latent trait variable is partialled out. We considered Q_3 indices $> |0.20|$ to indicate local dependence (Chen & Thissen, 1997). For an effortless transformation of proxy scale sum scores to theta estimates, EAP theta estimates for each possible sum score were estimated (Thissen et al., 1995). With this method, a crosswalk table for each domain was constructed. Furthermore, the EAP theta estimates of every participant on each domain were estimated to subsequently determine convergent validity. This was done by computing correlations of theta estimates based on the original domain scales and the theta estimates based on the SCID-II-SQ derived proxy scales. Correlations among (unit weighted) total scores were computed as well. We considered higher correlations between proxy and original domain scales to indicate stronger convergent validity. To interpret the estimated correlations, we compared their magnitude with correlations in previous studies that reported relationships between specific PD scales assessed with different PD self-report measures (Okada & Oltmanns, 2009; Schotte et al., 1998). On the basis of these findings, we considered correlations > 0.50 to indicate sufficient convergent validity. Additionally, Bland–Altman plots (Bland & Altman, 1995) were used for an investigation of agreement between theta estimates based on these two different measures. The standard error of theta as a function of theta was plotted for the SCID-II-SQ derived proxy scales of every domain to determine measurement precision. Furthermore, marginal reliability was computed for quantifying the average score reliability across the theta continuum. Following Nunnally (1978), we considered reliability estimates ≥ 0.70 to be sufficient for a range of research settings and estimates ≥ 0.90 to be necessary for applied settings.

Cross-validating proxy scales

In the last step, we carried out a 100 times repeated hold-out cross-validation procedure to validate our process of

[2]Because a 2PL model corresponds to a CFA with ordinal indicators, the starting slope cutoff can be translated to a standardized factor loading of 0.607.

constructing proxy scales and estimate out-of-sample theta and scale score correlations. To this end, we repeatedly split the sample into estimation and holdout subsets, containing 80% and 20% of the full sample, respectively. Within each estimation subset, we then applied our procedure for constructing proxy scales through the described linking method; that is, in each subset, we first estimated trait domain measurement models, then linked individual SCID-II-SQ items and selected the most discriminating items based on their slope parameters. Using the selected items and proxy scale model parameters from each estimation subset, we then calculated theta and scale score correlations between proxy scales and original domains in the corresponding holdout subset. Finally, we then calculated the 5th, 50th (i.e., median), and 95th percentiles of the correlations obtained in the holdout subsets.

RESULTS

Descriptive statistics of the seven SCID-II-SQ derived proxy scales and the original trait domain scales are displayed in Table S1. Model fit indices of the bifactor graded response models that served as measurement models for the maladaptive trait domains are displayed in Table S2. All seven measurement models showed acceptable model fit (RMSEA < 0.06, SRMR < 0.08, CFI > 0.95, TLI > 0.95).

At least eight items per domain could be selected with slope values ≥ 1.30 for the NA (*Mdn* = 1.67, *range* = 1.36–2.82) and the DET (*Mdn* = 1.45, *range* = 1.31–1.87) domain. For the remaining domains, the cutoff value had to be reduced to ensure that at least eight items could be selected. This lead to a median slope value of 1.37 in the PSY domain (range = 1.25–1.60), a median slope value of 1.30 for the DIS domain (range = 1.21–1.62), followed by a median slope value of 1.18 for the ANT domain (range = 0.97–1.54) and a median slope value of 0.85 for the PID5BF+M-AN domain (range = 0.75–1.15), and lastly, a median slope value of 0.37 for the PiCD-AN domain (range = 0.30–0.74). Most items that were selected in the total sample were also selected in a majority of estimation subsets during the cross-validation, except for items 54 and 77 in the PiCD-AN proxy scale, item 42 in the PID5BF+M proxy scale and item 32 in the DIS proxy scale. Difficulty and discrimination parameters of SCID-II-SQ proxy scale items obtained in the total sample, as well as the proportion of repetitions in which these items were selected in the cross-validation, are shown in Table 1. Standardized factor loadings are displayed in Table S3. Notably, 11 SCID-II-SQ items were selected in more than one proxy scale. One of these items was included in three proxy scales (item 98 pertaining to *chronic emptiness* in borderline PD criterion 7) and was included in the DET, NA, and DIS proxy scales. Across all seven scales, 25 item pairs displayed a Q3 index with an absolute value higher than 0.20 (seven item pairs in the DET and NA scale each, five item pairs in the PiCD-AN and PID5BF+M-AN scales each, and one item pair in the PSY scale). Fit indices of the derived proxy scales are reported in Table S4.

Figure 1 shows the standard error of theta as a function of theta, comparing the seven proxy scales to the original scales. The plots indicated that theta estimation of the proxy scales was most precise for the NA scale for theta estimates between 0.5 and 2.0. Marginal reliability across the full theta continuum was also highest for NA, equaling 0.71, followed by DET with 0.63. Marginal reliability of the remaining proxy scales was lower, equalling 0.47 for DIS, 0.45 for PID5BF+M-AN, 0.42 for PSY, 0.38 for ANT, and 0.22 for PiCD-AN.

Correlations between theta estimates of original AMPD and AN domain scales and theta estimates of the SCID-II-SQ proxy scales were calculated in the holdout subsets of the repeated cross-validation (see Table S5). The highest median theta correlations across the 100 cross-validation repetitions were observed for DET ($r = 0.68$) and NA ($r = 0.68$), followed by PSY ($r = 0.57$), DIS ($r = 0.53$), ANT ($r = 0.51$), PID5BF+M-AN ($r = 0.50$), and PiCD-AN ($r = 0.31$). Correlations of total scores and correlations based on the total sample without cross-validation were similar and are presented in Table S6. Bland–Altman plots that visualize systematic deviations (bias) in agreement between the two different measures (original vs. SCID-II-SQ proxy scales) can be found in Figure S1. The mean difference represents the estimated bias and was around 0 for all domains, with a most extreme value of −0.04 for the PSY domain, which means that the largest average systematic deviation across the investigated theta ranges was 4% of a standard deviation. However, as the 2.5 and 97.5 percentiles show, differences ranged from −1.32 to 1.56 for the DET domain to −1.97 to 1.61 for the DIS domain, illustrating that theta estimates of the same individual from the two different measures can highly deviate up to 1.97 standard deviations in theta estimates. This implies substantial uncertainty for the conversion of individual scores. A crosswalk displaying theta estimates to expected total scores can be found in Figure S2. A tabular crosswalk, including standard errors of theta and observed versus expected absolute frequencies of the proxy scale sum scores, is depicted in Table S7. Finally, we summarize associations of theta estimates based on SCID-II-SQ proxy scales and sociodemographic variables in Note S1.

TABLE 1 SCID-II-SQ proxy trait domain scales and their item parameters.

Domain	Item-No.	PD	Diagnostic criterion	a	b	CV
NA	4	**APD**	4: Preoccupied	1.53	1.15	1.00
NA	15	**DPD**	8: Preoccupied with fears of being alone	1.55	1.29	1.00
NA	28	NEPD	3: Sullen and argumentative	1.36	1.80	0.92
NA	31	NEPD	6: Complaints of personal misfortune	1.66	1.73	1.00
NA	33	DEPD	1: Depressed mood	1.70	1.31	1.00
NA	34	DEPD	2: Negative self-concept	1.89	1.42	1.00
NA	35	DEPD	3: Critical/derogatory toward self	1.76	1.12	1.00
NA	36	DEPD	4: Brooding and given to worry	2.82	0.60	1.00
NA	39	DEPD	6: Pessimistic	2.13	1.03	1.00
NA	40	DEPD	7: Prone to feeling guilty	1.54	0.89	1.00
NA	49	**STPD**	1: Ideas of reference	1.44	2.07	0.99
NA	59	**STPD**	5: Suspiciousness or paranoid ideation	1.67	1.25	1.00
NA	98	**BPD**	7: Emptiness	1.80	1.01	1.00
DET	1	**APD**	1: Avoids occupational activities	1.39	1.42	1.00
DET	2	**APD**	2: Unwilling to get involved	1.53	0.66	1.00
DET	33	DEPD	1: Depressed mood	1.87	1.26	1.00
DET	59	**STPD**	5: Suspiciousness or paranoid ideation	1.37	1.38	1.00
DET	61	**SPD**	2: Prefers solitary activities	1.31	0.71	0.88
DET	63	**SPD**	4: Takes pleasure in few activities	1.78	0.82	1.00
DET	65	**SPD**	7: Emotional coldness/detachment	1.49	2.02	1.00
DET	98	BPD	7: Emptiness	1.40	1.14	1.00
ANT	70	**HPD**	6: Self-dramatization	1.19	2.66	1.00
ANT	74	**NPD**	1: Grandiose self-importance	1.04	2.61	0.89
ANT	75	**NPD**	2: Fantasies of grandiosity	1.25	2.21	1.00
ANT	81	**NPD**	5: Sense of entitlement	0.97	2.16	0.69
ANT	82	**NPD**	6: Exploitative	1.54	1.78	1.00
ANT	84	**NPD**	6: Exploitative	1.39	2.27	1.00
ANT	86	**NPD**	8: Envy	0.99	2.96	0.79
ANT	93	**BPD**	3: Identity disturbance	1.05	3.14	0.94
DIS	11	DPD	4: Difficulty initiating projects	1.29	1.98	0.86
DIS	17	OCPD	2: Perfectionism	1.32	1.62	0.99
DIS	32	NEPD	7: Alternates between defiance & contrition	1.21	1.99	0.40
DIS	34	DEPD	2: Negative self-concept	1.27	1.71	0.79
DIS	92	**BPD**	3: Identity disturbance	1.31	2.24	0.92
DIS	93	**BPD**	3: Identity disturbance	1.62	2.40	1.00
DIS	98	**BPD**	7: Emptiness	1.22	1.23	0.55
DIS	99	**BPD**	8: Anger	1.32	2.55	0.95
PSY	50	**STPD**	1: Ideas of reference	1.49	2.06	1.00
PSY	51	**STPD**	1: Ideas of reference	1.31	2.14	0.88
PSY	55	**STPD**	3: Unusual perceptual experiences	1.60	2.06	1.00
PSY	56	**STPD**	3: Unusual perceptual experiences	1.30	2.12	0.86
PSY	57	**STPD**	3: Unusual perceptual experiences	1.25	2.69	0.62
PSY	92	**BPD**	3: Identity disturbance	1.43	2.18	1.00

(Continues)

TABLE 1 (Continued)

Domain	Item-No.	PD	Diagnostic criterion	a	b	CV
PSY	93	**BPD**	3: Identity disturbance	1.52	2.55	1.00
PSY	102	**BPD**	9: Paranoid ideation/dissociation	1.25	1.71	0.65
AN (PiCD)	16	**OCPD**	1: Preoccupied with details/rules	0.74	−0.62	1.00
AN (PiCD)	17	**OCPD**	2: Perfectionism	0.35	4.61	0.92
AN (PiCD)	19	**OCPD**	4: Moral scrupulousness	0.35	−0.26	0.94
AN (PiCD)	36	DEPD	4: Brooding and prone to worry	0.39	1.91	0.99
AN (PiCD)	39	DEPD	6: Pessimistic	0.43	2.86	1.00
AN (PiCD)	41	PPD	1: Unjustified suspicion of exploitation	0.46	3.65	1.00
AN (PiCD)	54	STPD	2: Odd beliefs or magical thinking	0.30	4.68	0.43
AN (PiCD)	77	NPD	3: Special status	0.30	7.27	0.47
AN (PID5BF+M)	16	**OCPD**	1: Preoccupied with details/rules	1.15	−0.42	1.00
AN (PID5BF+M)	17	**OCPD**	2: Perfectionism	1.00	1.86	1.00
AN (PID5BF+M)	31	NEPD	6: Complaints of personal misfortune	0.81	2.61	0.92
AN (PID5BF+M)	32	NEPD	7: Alternates between defiance & contrition	0.90	2.37	0.99
AN (PID5BF+M)	39	DEPD	6: Pessimistic	0.83	1.64	1.00
AN (PID5BF+M)	41	PPD	1: Unjustified suspicion of being exploited	0.87	2.12	1.00
AN (PID5BF+M)	42	PPD	2: Preoccupation about close ones' loyalty	0.75	1.79	0.43
AN (PID5BF+M)	99	BPD	8: Anger	0.81	3.56	0.89

Note: $N = 1228$. Note that one-dimensional models were computed for each domain. a = discrimination parameter, b = difficulty parameter. CV = Proportion of repetitions in which the item was selected in the 100 times repeated cross-validated item selection. Bold categorical PDs were expected to load on corresponding domains based on trait facet to specific PD relationships reported by Watters et al. (2019).
Abbreviations: AN (PiCD), anankastia operationalized with items from the PiCD questionnaire; AN (PID5BF+M), anankastia operationalized with items from the PID5BF+M questionnaire; ANT, antagonism; APD, avoidant PD; BPD, borderline PD; DEPD, depressive PD; DET, detachment; DIS, disinhibition; DPD, dependent PD; HPD, histrionic PD; NA, negative affectivity; NEPD, negativistic PD; NPD, narcissistic PD; OCPD, obsessive-compulsive PD; PPD, paranoid PD; PSY, psychoticism; SPD, schizoid PD; STPD, schizotypal PD.

DISCUSSION

This study aimed to provide algorithms to transform SCID-II-SQ measurements of the specific DSM-IV PDs into dimensional trait scores of the DSM-5 AMPD and ICD-11 PD model (NA, DET, ANT, DIS, PSY, and two operationalizations of AN). To this end, we applied a common metrics approach (Fischer & Rose, 2016) with a linking technique described by Wahl et al. (2014) to select SCID-II-SQ items that measure the maladaptive trait domains. Two major findings emerged: first, only the NA proxy scale showed measurement precision comparable with the original domain scale that would allow its application in research settings (i.e., reliability ≥ .70). This may be related to the higher number of items that could be selected for the NA proxy scale than for the other scales (Kemper et al., 2019). Second, we found acceptable convergent validity for all proxy scales, except for PiCD-AN. In fact, correlations between trait scores of proxy scales and original domain scales were similar to those observed between different DSM-IV PDs self-report instruments. For example, Schotte et al. (1998) reported a mean correlation of 0.61 between corresponding PD subscales of the Wisconsin Personality Disorders Inventory (WISPI; Klein et al., 1993) and the Assessment of DSM-IV Personality Disorders (ADP-IV; Schotte et al., 1998). Okada and Oltmanns (2009) reported median correlations of 0.45 between SCID-II-SQ and Personality Diagnostic Questionnaire-4+ (PDQ-4+; Hyler, 1994) PD subscales. Thus, the median correlation of 0.53 from our study fits in well with what one would expect in this field of research.

Associations between specific PDs and AMPD/ICD-11 maladaptive traits

Our results suggest that especially features of NA and DET are well represented in the SCID-II-SQ items. Contentwise, the DET domain was represented mostly by items of avoidant (two items) and schizoid PD (three items), which is in line with both previous domain- (Simon et al., 2023) and facet-level findings (Watters et al., 2019). However, given previous item-level findings

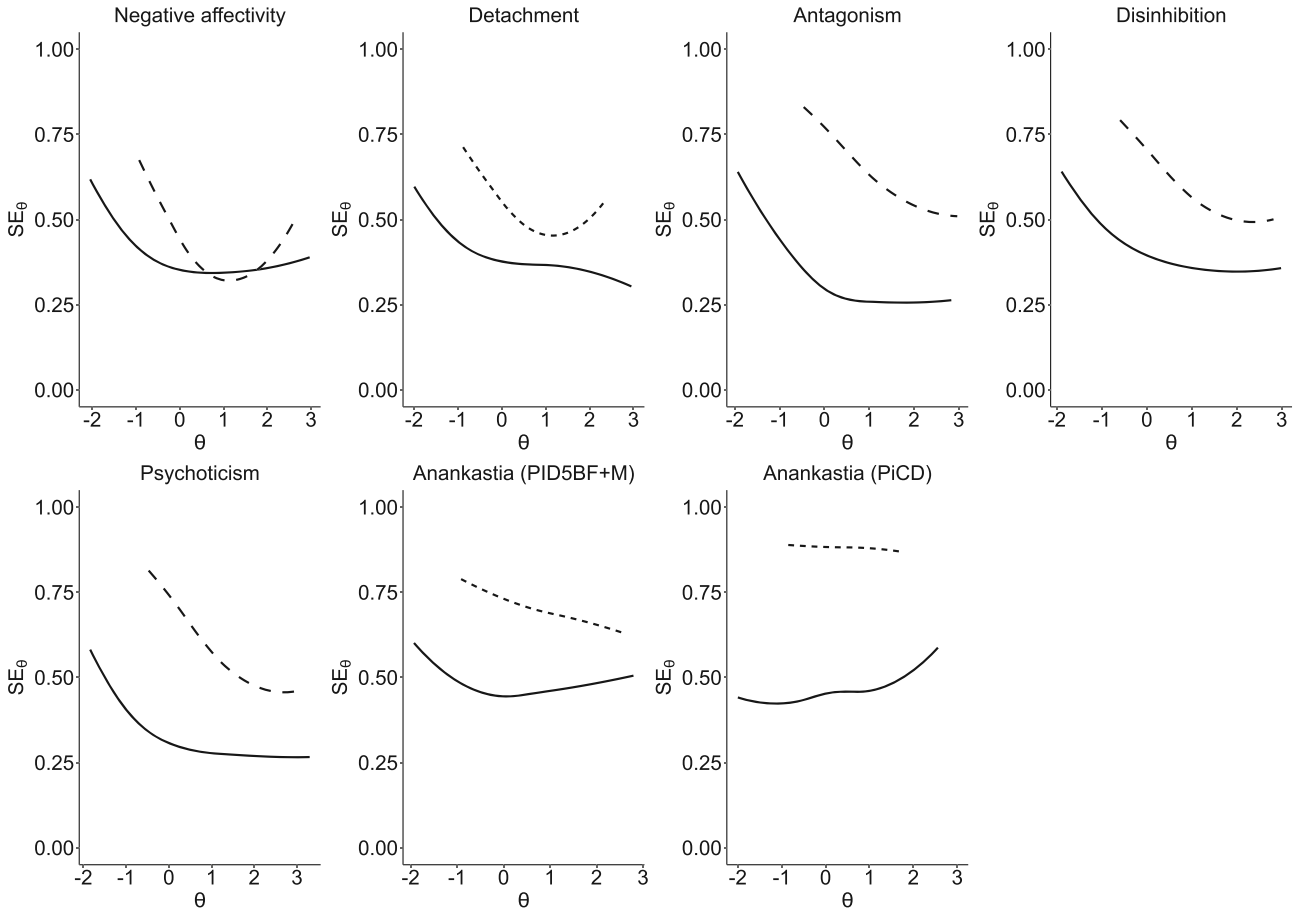

FIGURE 1 Standard error of theta (θ) estimates as a function of θ for proxy and original trait domain scales. *Note*: The solid line depicts the original trait domain scale. The dotted line depicts the constructed proxy trait domain scales based on the most discriminating Screening Questionnaire of the Structured Clinical Interview for DSM-IV Axis II (SCID-II-SQ) items.

of moderate to strong association (ranging from $r = 0.35$ to $r = 0.65$) between avoidant PD criteria and the core DET trait facets (Rojas & Widiger, 2017), we would have expected even more avoidant PD items to be sufficiently discriminating (i.e., show slope parameters ≥ 1.3) to be included in the DET proxy scale. Notably, item 33 belonging to depressive PD criterion 1 (*depressed mood*) emerged as the most discriminating item in the DET proxy scale. In the NA proxy scale, six of the 13 selected items assessed criteria of depressive PD. This implies that the information contained in depressive PD criteria has a particular overlap with NA. Further, two items selected for the NA proxy scale captured negativistic PD criteria 3 (*sullen and argumentative*) and 6 (*complaints of personal misfortune*). Taken together, 8 of the 13 items selected for the NA proxy scale were from DSM-IV research PDs that are not included in the DSM-5 Section II model.

We used two different operationalizations of the AN domain, and only the operationalization according to the PID5BF+M could be approximated to an acceptable degree with the SCID-II-SQ derived proxy scales. The particularly low correlation between proxy and original PiCD-AN domain scales may be related to the item wordings. As Damovsky et al. (2023) noted, some of the PiCD-AN items are worded in a manner that may not assess pathological expressions of AN, for example, PiCD-AN item 3 ("I carefully think things through before I act"). Still, the pattern of results regarding AN was surprising considering that previous studies have found strong associations between obsessive-compulsive PD and AN (Gecaite-Stonciene et al., 2021). Samuel et al. (2022) however recently argued that current operationalizations of AN fail to include multiple key features of obsessive-compulsive PD, most notably *workaholism*, which may explain why only criterion 1 (*preoccupation with rules and details*), and to a lesser extend criterion 2 (*rigid perfectionism*), emerged as strongly discriminating obsessive-compulsive PD items in both of our AN proxy scales.

Limitations and future directions

The present study is subject to several limitations. First, the sample comprised only Western, Educated, Industrialized, Rich, and Democratic (WEIRD; Henrich et al., 2010) individuals that were recruited from an online panel. Future common metrics studies should ideally include samples from non-WEIRD and treatment-seeking populations to ensure generalizability. Second, we used bifactor models for the PID-5 domains, which implies a strict definition of reliable variance. That is, only the common variance of the three facets is considered reliable, and their specific variance represents error. Because of this modeling approach, the measurement precision of the original trait domain scales may be lower than usual. Third, we observed local dependence between 25 item pairs in the derived proxy scales, and model fit was not always good. We did not remove correlated items from the scales, because the primary goal of the applied linking technique was to provide maximized information for the maladaptive trait domains. If one item per flagged item pair had been dropped and the item parameters had been subsequently re-estimated (as for example described in Batterham et al., 2018), the goal of keeping the target constructs anchored would have likely been compromised in the process. Fourth, despite our estimation of convergent validity through holdout cross-validation, the correlation estimates should be viewed as approximations. Ideally, convergent validity should be evaluated in a new sample. Fifth, our proxy scale construction process was entirely statistical, which sometimes lead to the inclusion of proxy scale items with questionable content. This raises the question whether a construction process based on substantive considerations would have been more appropriate, for example, using expert ratings to map specific DSM-IV PD criteria to trait domains (Levin-Aspenson et al., 2023). However, from a psychometric perspective, our linking process seems exhaustive in capturing covariation between individual SCID-II-SQ items and trait domains. Therefore, the results for the derived proxy scales can be considered as an upper limit for convergent validity in our sample.

Our choice of instrument to assess specific PDs has likely also impacted the results. Most importantly, the SCID-II-SQ does not cover antisocial PD criteria in adulthood. Considering previous results (Rojas & Widiger, 2017; Watters et al., 2019), the antisocial PD criteria would have likely contained important information for improving convergent validity of the DIS and ANT proxy scales. Further, the SCID-II-SQ uses a dichotomous response format that likely limits the items' reliability and test information compared with instruments with polytomous response formats. Okada and Oltmanns (2009) also noted that non-pathological wordings of some SCID-II-SQ items do not accurately reflect the PD criteria; for example, item 67 ("Do you flirt a lot?") does not reflect the inappropriately sexually seductive or provocative manner of the histrionic PD criterion 2. Considering the dichotomous item response format, these non-pathologically worded items likely do not discriminate well in the higher, more pathological theta ranges. Lastly, the convergence between SCID-II-SQ and the SCID-II interview is not clear. To our knowledge, few recent studies have investigated the convergent validity of the SCID-II-SQ and the subsequent interview directly (see also Gárriz & Gutiérrez, 2009), but earlier studies point toward low (Ekselius et al., 1994) to moderate (Jacobsberg et al., 1995) agreement, and it has been a common observation that the SCID-II-SQ cutoffs indicate more PD diagnoses than subsequent SCID-II interviews (Ramklint et al., 2010; Ullrich et al., 2008).

For future studies establishing a common metric, it would be desirable to use items that are answered in a polytomous response format and are consistent and specific in their wordings, particularly targeting pathological expressions described in the PD criteria. For example, the self-reported version of the Multisource Assessment of Personality Pathology (Oltmanns & Turkheimer, 2006), with its focus on item wordings that are as consistent as possible with the specific PD criteria, or the self-report ADP-IV (Doering et al., 2007; Schotte et al., 1998), with its two-step rating process on a 7-point and 3-point scale, may be particularly suitable. Given previous findings that PD screening questionnaires vary in their sensitivity and specificity (Gárriz & Gutiérrez, 2009), including differences in sensitivity for different specific PDs (Okada & Oltmanns, 2009), it may also be worthwhile to include multiple measures of PDs in future common metric studies. In this way, systematic differences between different questionnaires could be approximated, so that trait-relevant test information that is absent across self-reported PD measures could be distinguished from test information that is absent only in specific questionnaires. Because self-reported assessments in general are prone to several biases (e.g., Huprich et al., 2011), including individuals' limited introspection abilities, future research should also seek to establish transformation algorithms through interview assessments.

Conclusion

The derived algorithms to transform SCID-II-SQ ratings to AMPD and ICD-11 AN trait domain estimates could only produce one proxy scale (NA) for which both reliability and out-of-sample convergent validity estimates

were sufficient for application in research settings. This may be attributable to limitations of the SCID-II-SQ, including limited test information due to non-pathologically worded items and the dichotomous item response format. Future attempts to establish transformation algorithms between PDs and maladaptive trait assessments should be repeated either using self-report measures that assess PDs with a higher specificity, using multiple self-reported PD assessments, or on interview-based PD assessments.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflict of interest.

ETHICS STATEMENT

The study is a secondary analysis. No data were collected for this study.

DATA AVAILABILITY STATEMENT

This study was not preregistered. Data, study materials, and R Code are publicly available on the Open Science Framework: https://osf.io/ba37m/.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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