

The Spectrum of Personality Pathologies – Zooming in on Transdiagnostic Dimensionality and Operationalization in Time- limited Practice

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Talking about norm and normality therefore means having to talk about deviation in particular.
To a certain extent, what is “normal” can only be inferred from what is “not normal”.

(Hark, 1999, translated from the original German work)

Abstract

Categorical personality disorder (PD) models have been rejected in favor of alternative dimensional approaches by the DSM-5 Alternative Model for Personality Disorder (AMPD) in and the ICD-11 classification. This has resulted in numerous studies testing the empirical validity of the DSM-5 AMPD and ICD-11 approaches, including transdiagnostic indicators. While well-validated self-reports support the operationalization of these dimensional approaches, (semi-)structured interviews are considered the gold standard for the assessment of PD. However, given the time constraints in clinical practice, there is a need to identify core dimensions of personality pathology to get directly to the essence of PD.

Therefore, the present thesis focuses on the empirical foundation of three aspects of dimensional PD approaches. First, we sought to examine the impact and transdiagnostic overlap between potential personality pathologies and other mental disorders, e.g., somatization. Therefore, we conducted a systematic literature search to identify and synthesize the evidence of convergence between personality dysfunctions and somatization disorder. Additionally, existing concepts of somatization were crucially reflected in the context of the DSM-5 AMPD (Study I). Second, we focused on the operationalization of personality functioning according to DSM-5 AMPD. Therefore, we translated and evaluated the psychometric properties of a self-report questionnaire – the Self and Interpersonal Functioning Scale (SIFS). We then conducted and analyzed a large multi-method dataset from different non-clinical and clinical samples and evaluated the structure, reliability, validity, and loading pattern of the SIFS (Study II). Third, we sought to evaluate core dimensions of personality dysfunction that can provide clinical approximation of the personality dysfunction severity in time-limited practice. To this end, we used the data of a multi-method design consisting of well-validated (semi-)structured interview and self-report ratings of personality functioning, personality organization, and personality structure to calculate a latent method-adjusted general factor of personality dysfunction severity (g-PDS; Study III).

Study I showed that PDs and personality pathologies are in fact often comorbid in subjects suffering from somatization. Whereas categorical PD diagnosis models revealed unspecific results, dimensional PD diagnostic approaches showed high associations with somatization in the following personality dimensions: pathologies of the self, negative affectivity harm avoidance, and self-defeating traits. This underlines the need to develop easily applicable instruments for the assessment of DSM-5 AMPD personality functioning across various mental disorders. In Study II, the German version of the SIFS self-report questionnaire

could be such an easy-to-use instrument; nevertheless, our results indicate that it warrants modifications for the use in research. However, a 22-item adapted version can be used as a self-report questionnaire in clinical practice. Its psychometric properties in assessing the general personality disorder (g-PD) factor are sufficient, but it shows insufficient structural validity for the specific factors. Study III showed that among the variety of interview-rated dimensions four PDS dimensions – defense mechanisms, desire and capacity for closeness, sense of self with boundaries to others, and understanding and appreciation of experiences and motivations of others – efficiently approximate the latent, method-adjusted g-PDS with 95.0% explained variance. When combining two of these four dimensions, between 81.8% and 91.3% of the latent g-PDS variance can be explained. Of note, measures of defense mechanisms are lacking in the conceptualizations of the ICD-11 and DSM-5 AMPD. Regarding self-report dimensions, we recommend assessing at least the identity and intimacy subdomains of personality functioning.

Taken together, our studies establish that the assessment of personality functioning has an important transdiagnostic value to somatization pathologies and their treatment. To facilitate the diagnostic process, the SIFS can be used for a global impression of the level of personality functioning, but should be used with caution in research. Finally, in time-limited practice, a special emphasis should be placed on self-report and interview-assessed subdomains of identity and intimacy to approximate the g-PDS. Furthermore, our results highlight the relevance of old psychodynamic concepts, such as defense mechanisms, in contemporary transdiagnostic personality pathology research.

1. Theoretical Background

1.1 Personality and Personality Pathology

Personality disorders (PDs) are common with 8 to 17% individuals in the general population meeting the criteria for any PD (Winsper et al., 2020; Volkert et al., 2018), and between 40 and 92% of psychiatric outpatients suffer from PDs (Beckwith et al., 2014). However, since everyone has a personality, the question when normality ends and pathology begins may be even more challenging compared to other psychiatric disorders (Stone, 2012). Historically, psychiatric nosology on PDs has always faced difficulties regarding its operationalization and diagnostic process. Early classifications such as the second edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-II, American Psychiatric Association (APA), 1968) were influenced by psychoanalytic, dimensional theories and distinguished PDs from neuroses (Crocq, 2013). With the DSM-III (APA, 1980), the distinction between normal and pathological personality was given specific attention through establishing for the first time a separate axis for PDs. This included a shift to a categorical system influenced by the medical model of grouped clusters and types of PDs. A disordered personality structure has been characterized by inflexible and extreme forms of maladaptive personality traits (Livesley & Jang, 2005), with consensus that personality components are rooted in genetic and constitutional dispositions, as well as psychosocial and environmental interactions. Nonetheless, there has been an ongoing controversy over personality and PD theories in recent decades. The main obstacle to progress in the field of PD research may have been a radical reductionism of the theoretical frameworks (e.g., purely psychoanalytical theories that emphasize only unconscious conflicts and ignore neurobiological components of motivational systems, or radical factor analytical mapping that distinguishes a simplistic categorization of normal and pathological personality traits and denies profound psychological structures of behavior; Kernberg, 2016). Disagreements between dimensional and typological classifications of PDs thus seemed inherent to the history of PDs and are currently reopened (Crocq, 2013).

1.2. Limitations of the Personality Disorder (PD) Categories

The 10th edition of the International Classification of Mental and Behavioral Diseases (ICD-10, World Health Organization (WHO), 1992) and the DSM-IV (APA, 1994) classify PDs as behavioral, emotional, and thought patterns that significantly deviate from the sociocultural environment and are evident in various situations (e.g. cognition, impulse control,

relationships, or affectivity) and stable over time. These disturbances are quantitatively evaluated among several criteria, which indicate the presence or absence of a PD.

However, categorical PD thresholds are arbitrarily set and fuel dichotomous divisions into disordered and healthy subjects, which, in turn, have stigmatizing effects on individuals (Sheehan et al., 2016). In recent years, research has repeatedly shown comprehensively documented shortcomings of the categorical system, showing low validity and reliability (Clark, 2007). Instead, individuals fluctuate on a continuum between sick and healthy throughout their life. Today, clinicians continue to work with the ten PD categories (e.g., histrionic or paranoid PD) defined by the ICD-10, although practice has shown that a clear assignment to any PD category is difficult due to the heterogeneous expressions of PD and the temporal instability of categorical PD diagnoses (Morey et al., 2015; Widiger & Trull, 2007). Additionally, subthreshold impairments provide meaningful clinical information (Karukivi et al., 2017), and practitioners are challenged by the constant overlap between PD categories (Morey et al., 2015). Due to this lack of discriminatory power, clinicians mostly use the category of “PD not otherwise specified” (Verheul et al., 2007). Accordingly, these weaknesses are considered in dimensional PD models, which has led to a growing number of research.

With the last revision of the ICD-10, a fundamental shift from a categorical to a fully dimensional PD system occurred in the ICD-11 (WHO, 2022). The DSM-5 (APA, 2013), however, still contains the PD categories from DSM-IV with few changes and a half-dimensional aspect based on the expressions and number of categorical items. The most important change from DSM-IV to DSM-5 has been the removal of the age limit of 18 years as a prerequisite for diagnosis. The removal of axis differentiation for PDs is present in both, the ICD-11 and DSM-5. Nevertheless, a dimensional PD approach in DSM-5 was only considered in the appendix and includes a hybrid model called the Alternative Model for Personality Disorders (AMPD; APA, 2013).

1.3. Dimensional Approaches of Personality Disorder in the DSM-5 Alternative Model for Personality Disorders (AMPD) and in the ICD-11

The DSM-5 AMPD allows, on the one hand, continuing to assess PD categories, and on the other hand, assessing personality based on two dimensional criteria – Criterion A and Criterion B. Criterion A comprises the Personality Functioning (PF), including two domains, a self-domain grouped into identity and self-direction and an interpersonal domain grouped into empathy and intimacy:

Self-functioning:

- **Identity:** Sense of self with boundaries to others; stability and accuracy of self-esteem; emotional range and regulation
- **Self-direction:** Ability to pursue meaningful short- and long-term goals; constructive and prosocial internal standards of behavior; productive self-reflection.

Interpersonal functioning:

- **Empathy:** Understanding and appreciation of experiences and motivations of others; tolerance of differing perspectives; understanding of effects of own behavior on others.
- **Intimacy:** Depth and duration of connections; desire and capacity for closeness; mutuality of regard reflected in interpersonal behavior.

Out of these twelve facets (each rated on a five-point Likert scale) a total score can be built and accounts for the PF. For a PD diagnosis, a moderate impairment (level 2) must be present in at least two of the four domains (APA, 2013). Subsequently, to operationalize the Criterion A new self-report instruments and (semi-) structured interviews have been developed in the recent years, e.g., the Self and Interpersonal Functioning Scale (SIFS, Gamache et al., 2019) or the Semi-Structured Interview for Personality Functioning DSM-5 (STiP-5.1; Hutsebaut et al., 2017). An overview of PF assessment instruments can be found by Zimmermann et al. (2023b).

Parallel to the development of Criterion A, Criterion B accounts for stylistic differences in the expression of PD (Zimmermann et al., 2019) and comprises five maladaptive personality trait domains, including antagonism, detachment, disinhibition, negative affectivity, and psychoticism (APA, 2013). Criterion B has its roots in a more atheoretical, descriptive approach of personality, such as in the Five Factor Model, also known as the Big Five (Costa & McCrae, 1992), which is an extensively validated, dimensional model of personality (Widiger & McCabe, 2020) and consists of observed characteristics occurring in individuals with PDs (Krueger, 2019). This approach is based on the linguistic differences that individuals use to describe themselves or others and thus emphasizes lexical aspect of personality (Allport & Odbert, 1936). However, in addition to the phenotypic PD expression, individuals with high scores in the total of maladaptive traits may be more severely impaired in PF (Zimmermann et al., 2020). The most prominent instrument for assessing Criterion B is the Personality Inventory for DSM-5 (PID-5; Krueger et al., 2012; Zimmermann et al., 2014) and the Structured Clinical Interview for the AMPD – Module II (SCID-5-AMPD-II; Skodol et al., 2018).

Criterion A and B are applied for meeting one of the six categorical DSM-5 diagnoses (antisocial, avoidant, borderline, narcissistic, obsessive-compulsive, schizotypal PD). For each, a moderate impairment (level 2) of Criterion A and different Criterion B traits are mandatory, e.g., for a narcissistic PD the maladaptive traits grandiosity and attention seeking (both facets of the domain antagonism) must be met. If the specific Criterion B traits are not met for a categorical PD diagnosis, the PD – trait-specified diagnosis can be given (APA, 2013).

The ICD-11 approach dares a further step towards a fully dimensional conceptualization and comprises “the most radical change in the classification history of personality disorders” (Tyrer et al., 2019), including the complete disappearance of PD categories. This first official fully dimensional approach aligns conceptually with the DSM-5 AMPD through the assessment of Criterion A and B, but additionally includes emotional, cognitive, and behavioral manifestations of the personality dysfunctions (WHO, 2022):

Emotional manifestations:

- Appropriateness and range of emotional experience and expression.
- Tendency of being emotionally over- or under-reactive.
- Ability to recognize and acknowledge difficult or unwanted emotions (e.g., sadness).

Cognitive manifestations:

- Accuracy of interpersonal and situational appraisals, especially under stress.
- Ability of appropriate decision making in situations of uncertainty.
- Flexibility and appropriate stability of belief systems.

Behavioral manifestations:

- Flexibility in impulse control and modulation of behavior based on the situation and consideration of the consequences.
- Appropriateness of behavioral responses to stressful circumstances and intense emotions (e.g., propensity to self-harm or violence).

Criterion B is called trait domain qualifiers in the ICD-11, including anankastia, detachment, dissociality, disinhibition, and negative affectivity. Additionally, after profound criticism from different PD experts, a borderline pattern classifier was subsequently included (Tyrer et al., 2019). In comparison to the DSM-5 AMPD, trait domain qualifiers can be used voluntarily in the ICD-11 (WHO, 2022).

1.4. Psychodynamic Roots of Personality Dysfunction in DSM-5 AMPD and ICD-11

While the DSM-5 AMPD and ICD-11 diagnostic systems are merely empirically derived, psychodynamic models are based on a theoretical framework that integrates a priori assumptions and ideas of humans and include a foundation that also contains implications for treatment planning and information for prognosis (Blüml & Doering, 2021). The common denominator of these psychodynamic models is the underpinning of the importance of early emotional interaction experiences and social information processing capabilities in the development of mental health problems (Kerber et al., 2023, Blüml & Doering, 2021). Modern psychodynamic concepts, such as the operationalized psychodynamic diagnosis (OPD Task Force, 2008, 2023), Kernberg's model of personality organization (PO; Kernberg, 2004) with its revised operationalization in the Structured Interview of Personality Organization (STIPO-R, Clarkin et al., 2019), and the Inventory of Personality Organization (IPO; Clarkin et al., 1995; Lenzenweger et al., 2001), are widely used in clinical practice. These contemporary psychodynamic models were also very influential for the development of PF in the AMPD and the ICD-11, and several studies have shown relatedness in terms of theory and empiricism (Zimmermann et al., 2012, 2015, 2020; Kampe et al., 2018; Zettl et al., 2019; Blüml & Doering, 2021; Hörz-Sagstetter et al., 2021). However, psychodynamic concepts encompass a broader range of mental disorders and are not limited to PD.

For an example, the multi-axial OPD system contains four axes for the diagnostic assessment of mental disorders. Among them; the personality structure (PS) axis was the most relevant for the development of the ICD-11 and the DSM-5 AMPD. It includes the following four domains – perception, regulation, communication, and attachment – each is rated from both intra- and interpersonal perspectives, closely aligning with PF in the DSM-5 AMPD and ICD-11. Interestingly, the latest revision of the OPD (OPD-3; OPD Task Force, 2023) also includes defense mechanisms for the first time, reintroducing an old psychodynamic construct into the modern diagnostic process of all mental disorders.

Similarly, Kernberg's model, based on object relations theory (Klein, 1959; Huprich et al., 2016), suggests the origin of PD in unstable early relational experiences and predisposed temperament from which unconscious characteristic personality patterns develop. The objects symbolize the interactions with caregivers, which are internalized in the child as self-objects imprints and represent guiding mental models for self-perception and further relationships. Based on this theory, this model includes the five core domains of PO – identity, defense mechanisms, reality testing, aggression, and moral values (Kernberg, 2004), some of which

have also found resonance in the DSM-5 AMPD and ICD-11. To date, research has shown only one longitudinal (i.e., 14 years) psychodynamic evidence on the relationship between impairments of maternal bonding, early temperament, and personality dysfunctions of individuals (Fleck et al., 2021).

1.5. Research Traditions on PDs and Contemporary Transdiagnostic Models

Taken together, the DSM-5 AMPD and the ICD-11 PD approaches incorporate the different scientific traditions. Here, PF encompasses the psychodynamic, etiological approach, which relates to the understanding of qualitative personality processes of self- and interpersonal impairments. Personality traits, on the other hand, encompass the non-etiological, descriptive approach, which relates to the dimensionality of personality. Additionally, recent findings have shown that PF reveals less longitudinal stability compared to personality traits (d'Huart et al., 2022; Haehner et al., 2023). Further, PF is more likely to predict the presence of a PD based on general core personality pathology, whereas personality traits are more related to the phenotypic expression of PDs (Garcia et al., 2021; Nysaeter et al., 2023). Moreover, besides the use of DSM-5 AMPD and ICD-11 approaches for PD diagnosis, there is increasing evidence of their transdiagnostic potential (Zimmermann et al., 2019; Sharp & Wall, 2021).

In contrast to the DSM-5 AMPD and ICD-11, the Hierarchical Taxonomy of Psychopathology (HiTOP; Kotov et al., 2017) critiques the entire traditional system consisting of mental disorder categories, opposing a quantitative nosology diminishing comorbidity, arbitrary boundaries, and diagnostic instability. Therefore, HiTOP concentrates on psychopathology as a series of transdiagnostic dimensions and arranges mental disorders into six common spectra (Kotov et al., 2017). This factor analytical approach reduces heterogeneity within disorders (e.g., multiple diagnoses, subthreshold disorders, and low interrater reliability) and aims to identify a natural arrangement of signs and symptoms, thereby reducing information loss associated with psychiatric categories. HiTOP was developed by researchers from the DSM-5 PD working group in response to the displacement of the AMPD in the DSM-5 appendix. It mainly falls within the non-etiological, descriptive tradition, associating maladaptive trait domains with mental disorders. However, considering that the HiTOP general factor for psychopathology is mainly associated with PF (Kerber et al., 2024), which is in psychodynamic traditions, HiTOP might offer an integration of both traditions.

Even though diagnostic instruments based on both traditions have been proven to be helpful in understanding personality and personality pathologies, the early research output

focusing on Criterion B was much more potent in comparisons to Criterion A studies (Zimmermann et al., 2019). Therefore, this thesis focusses on the empirical foundation on aspects of Criterion A, incorporating psychodynamic understanding and instruments for the comprehension of personality dysfunctions.

2. Aims of this Thesis

The overall aim of this thesis was to zoom in on the dimensionality and transdiagnostic impact of PD in mental health problems and to contribute to the empirical foundation of the operationalization and practicability of the DSM-5 AMPD and the ICD-11.

In emphasizing dimensionally assessed PD, this thesis pursued three specific aims: First, to examine the relevance of personality pathology in other mental disorders (e.g., somatization); second, to validate a German self-report questionnaire to facilitate the complex assessment of PF; and third, to determine most essential dimensions from different PD conceptualizations for the clinical approximation of personality dysfunction severity (PDS). Thus, with the scope of this thesis, these three aims focus on the neglect of PD diagnosis in general and dimensional PD diagnosis in specific, the statistical and clinical validation of a self-report assessing PF, and the empirical validation of the core dimensions approximating the PDS. In the following, the detailed objectives of Study I, II, and III are described:

Study I. As the literature has shown limited data for somatoform dimensions in the HiTOP model (Kotov et al., 2017), we aimed to conduct a systematic review to assess the potential empirical body focusing on PD comorbidity among patients suffering from somatization. Therefore, this systematic review followed two primary questions:

- a) Are personality pathologies in somatization disorder (SD) and somatic symptom disorder (SSD) subjects overlooked?
- b) How can somatization be reflected transdiagnostically in dimensional models such as the DSM-5 AMPD?

To address these primary questions, the aims of this review were (1) to systematically examine research articles investigating personality assessments in individuals with SD/SSD, (2) to review evidence examining overlaps between the specific DSM-5 AMPD or ICD-11 approach and SD and DSM-5 SSD, and (3) to relate the findings of aim 1 and 2 to the dimensional approach of DSM-5 AMPD, in order to highlight the impact and dimensionality of personality pathologies in SD/SSD subjects.

Study II. The operationalization of the DSM-5 AMPD approach has led to the development of several self-report questionnaires, of which the SIFS is a brief self-report that promises to capture the four domains of PF (identity, self-direction, empathy, intimacy) and has been promoted as a time-efficient instrument with sound psychometric properties. Moreover, the original SIFS version showed to be highly associated with relevant personality constructs (e.g., aggression, identity diffusion, low self-esteem, low empathy, low life satisfaction, primitive defense, narcissistic and borderline PD symptoms, and maladaptive personality trait domains; Gamache et al., 2019). Furthermore, the SIFS has been proposed as a PD screener for ICD-11 (Gamache et al., 2021). Therefore, we wanted to evaluate the German version of the SIFS, especially since the SIFS has never been evaluated using a multi-method design that excludes common method bias. Hence, the primary question was:

- c) Should the German version of the SIFS be used in research and in clinical contexts with regard to its psychometric properties?

In this respect, the aims of this article were (1) to investigate the factor analytic structure of the SIFS, (2) to test internal consistency and test-retest reliability of the general personality disorder (g-PD) factor and the domain scores, and (3) to investigate the SIFS' convergent validity across various interview and self-report assessments for PF, PO, maladaptive personality trait domains, PD categories, and well-being in a sample covering the full spectrum of PF impairments. Computing these analyses, we aimed to compare the psychometric properties of the SIFS to the Level of Personality Functioning -Brief Form 2.0 (LPFS-BF 2.0), which is another prominent brief self-report that captures two scales for the dimensions of self- and interpersonal functioning.

Study III. Clinical interviews are considered the gold standard for the assessment of PD, since the self-image of subjects with PD may be impaired (Widiger & Samuel, 2005; Samuel et al., 2013; Oltmanns & Oltmanns, 2019). Yet lack of time in clinical settings often impedes a detailed but necessary diagnosis of PD. However, previous studies have shown that specific PDS dimensions share a strong latent g-PDS (Bliton et al., 2022; Zimmermann et al., 2020). Therefore, we sought to approximate the latent PDS with different conceptualizations of personality pathology, including PF, PO, and PS for the efficient use in time-limited practice. The primary questions regarding the approximation of the PDS were:

- d) Which are the empirically sound PDS interview core dimensions that capture largest amounts of g-PDS variance?

e) Which are the most reliable self-report dimensions to approximate the method-adjusted g-PDS?

To this end, the aims were (1) to investigate the core PDS dimensions based on dimensions of three different interviews – the STiP-5.1, the SCID-5-AMPD-I, and the STIPO-R, and (2) to identify dimensions of three different self-report questionnaire – the LPFS-Self Report (LPFS-SR), IPO-30, and OPD-SQ that are most reliable to capture essential amounts of variance of the interview based assessment of PDS. Based on these two aims, we were also interested in the extent to which the essentially psychodynamic constructs (such as defense mechanisms) contribute to the approximation of the latent method-adjusted PDS.

3. Summary of the Methods

3.1. Somatization and Somatic Symptom Disorder and its Overlap with Dimensionally Measured Personality Pathology: A Systematic Review (Study I)

Search strategy and eligibility criteria. We conducted a systematic review by searching PubMed, Scopus, and Web of Science through July 2020. We chose a triple combination of search terms including somatization, SD, and SSD; personality, maladaptive personality trait domains, PD categories, and dimensional personality terms; and dimensional diagnostic systems (for details see Appendix Study I). We included studies that met the following eligibility criteria: (1) adult patients (18-79 years), (2) studies published in English, (3) psychiatric study population requiring a DSM-IV or ICD-10 diagnosis of somatization disorder or SD or DSM-5 diagnosis of SSD, and at least one clinical control group (CC), or a healthy control group (HC), (4) containing at least one instrument for the assessment of personality, and (5) excluding hypochondriasis according to ICD-11, where it is classified under obsessive-compulsive and related disorder, which is a contrast to DSM-5.

Data collection process and data items. Two reviewers screened the data independently (titles, remaining abstracts, and finally full-text) and included a third reviewer in case of no agreement. Data items were extracted when following information was available: (1) mean sex, mean age, group composition of the samples, (2) diagnostic assessment method, (3) inclusion of a control group (either CC or HC), and (4) study design (objectives, dependent and independent variables, results). Studies without an assessment for psychosomatic symptoms (e.g., somatic symptoms in migraine) were excluded. Finally, we cross-referenced the included and theoretical studies without a clinical sample and repeated the procedure.

Risk of bias. Risk of bias in the individual studies, including blinding, random sequence generation, selective reporting, incomplete data, and attribution, was assessed unblinded at study-level from two independent authors. We drew out data using predefined data panels. Due to heterogeneous results and quite small numbers of identified and included studies, we decided against a quantitative meta-analysis and a quantitative assessment of risk of bias across the studies. Therefore, we assessed the risk of bias qualitatively and estimated it rather low.

3.2. Evaluating the Psychometric Properties of the German Self and Interpersonal Functioning Scale (SIFS) (Study II)

Participants and procedure. From July 2020 to April 2022, patients from Berlin ($n = 137$) and Basel ($n = 87$), non-clinical subjects (NCs) from Basel ($n = 29$), and NCs from the panel provider Clickworker ($n = 633$) were enrolled in our study. Patients were included if they were (1) seeking psychotherapy, (2) at least 18 years old, and (3) sufficiently fluent in German. Acute suicidal, psychotic, intellectually disabled or cognitively impaired due to substance or medication use patients were excluded. All included subjects ($n = 886$) gave informed consent. The Northwestern and Central Swiss Ethics Committee and the Ethics Committee of Psychologische Hochschule Berlin approved the study for the respective study sites. All participants, except of the Basel clinical sample and the Berlin inpatient sample, received a small financial compensation.

(Semi-)structured Interviews. For the interview assessment of PF we used two different interviews for the study sites. For Basel we used the STiP-5.1 (Hutsebaut et al., 2017) and for Berlin the SCID-5-AMPD-I (Bender et al., 2018). Both interviews assess the four domains (with twelve subdomains) and the total score of PF on a scale from “0 = no impairment” to “4 = extreme impairment”. They differ in their structure, since the SCID-5-AMPD-I is a fully structured interview with a funnel structure, after an open introduction section and the STiP-5.1 is semi-structured, leaving more responsibility to the interviewer to collect and clarify enough information. Additionally, we assessed categorical PDs using the SCID for DSM-5 PDs (SCID-5-PD; Beesdo-Baum et al., 2019a) in the German clinical sample. For the exclusion of mental disorders in the NC sample, we used the ten modules of the SCID for DSM-5 Disorders (SCID-5-CV; Beesdo-Baum et al., 2019b) and SCID-5-PD.

Self-report questionnaires. The main self-report questionnaire was the 24-item SIFS (Gamache et al., 2019), which assesses PF according to the DSM-5 AMPD on a 5-point Likert scale (“0 = This does not describe me at all” to “4 = This describes me totally”). The original

French version of the SIFS was translated into English by Gamache et al. (2019). Based on the English version, two authors (CM and JW) translated the SIFS items into German. Subsequently, two independent, blinded, bilingual German-English native speakers verified the German version by back-translation before the original author (DG) approved it. In the original version of the SIFS best Confirmatory Factor Analysis (CFA) model fit was found for a second-order model with the four factors (identity, self-direction, empathy, intimacy) loading on a g-PD factor. This model revealed high internal consistency of the scales (Cronbach's α between .60 and .92) and test-retest reliability ($r =$ between .63 and .92; Gamache et al., 2019). To test re-test reliability in our study, a subsample of 200 Clickworkers were invited in a retest assessment after two weeks, whereof 157 Clickworkers were identified via their code.

Further, we used other self-reports assessing PF, such as the 80-item LPFS-SR (Morey, 2017) and the 12-item LPFS-BF 2.0 (Weekers et al., 2019), both rated on a 4-point Likert scale ("1 = completely untrue" to "4 = completely true"). The 36-item PID Brief Form Plus Modified (PID5BF+M; Bach et al. 2020) was used to assess the maladaptive trait domains and the additional ICD-11 domain anankastia, rated on a 4-point Likert scale ("0 = very untrue or often untrue" to "3 = very true or often true"). Further, we used the IPO-16 (Zimmermann et al., 2013) to assess PO on 16 items, which are rated on a 5-point Likert scale ("1 = never true" to "5 = always true"). The Brief Inventory of Thriving (BIT; Su et al., 2014) was used to assess well-being. The ten items are rated on a 5-point Likert scale ("1 = I totally disagree" to "5 = I totally agree"). Self-report data were collected via the platform formr (Arslan et al., 2019).

Statistical analyses. Since the construct of PF implies a strong g-PD factor, we investigated the factor structure by CFA and compared bifactor models with one g-PD factor and two (self- and interpersonal; model 1) or four (identity, self-direction, empathy, intimacy; model 2) specific factors. Additionally, as assumed by Leclerc et al., (2021), reversed items can affect the factor structure, therefore we examined model 1 and 2 with a method factor for reversed items (model 3 and 4, respectively). If the four specific PF domains can be captured by the German version of the SIFS, models 2 or 4 should have good fit indices and a consistent loading pattern. We excluded all other models computed by Gamache et al. (2019) because the other confirmatory models are more restrictive than the bifactor models. Maximum likelihood estimation with robust standard errors and a Satorra-Bentler scaled test statistic was used (Satorra & Bentler, 2001). Good CFA model fit included the Root Mean Square Error of Approximation (RMSEA) close to or below .06, the Standardized Root Mean Square Residual (SRMR) close to or below .08, and the Tucker-Lewis Index (TLI), as well as the Comparative

Fit Index (CFI) close to or above .95 (Hu & Bentler, 1999). The explained common variance (ECV) was assumed to be $> .60$ for essential unidimensionality (Reise et al., 2013). ECV was calculated for the g-PD factor and the specific factors.

For the calculation of internal consistency we used model-based Omega total (ω) and Omega Hierarchical (ω_H , Brunner et al., 2012) for the SIFS sum score ($\omega_H > .70$ indicates unidimensionality; Reise et al., 2013). For the calculation of the reliability of the specific SIFS domains, we used ω_s and ω_{Hs} ($\omega_{Hs} > .50$; Reise et al., 2013). Test-retest reliability after two weeks was calculated with bivariate zero-order correlations.

Convergent validity was investigated by correlations between the SIFS and the LPFS-SR, LPFS-BF 2.0, IPO-16, the PID5BF+M, and BIT; as well as with the SCID-5-AMPD-I, STiP-5.1, and the SCID-5-PD. Correlation coefficients were interpreted as small ($= .10$), medium ($= .30$), and large ($= .50$) according to Cohen (1992). We used Zou's confidence intervals (CIs) for dependent correlations to compare the correlations between SIFS domain scores and external measures with each other (Zou, 2007). Correlation difference confidence intervals not including zero as significant were documented.

In line with West et al. (1995), we verified that the SIFS items were sufficiently normal distributed with a skewness < 2 and kurtosis < 7 . For all the analyses, we used the statistical software R version 4.1.0 (R Core Team, 2021).

3.3. Determining Essential Dimensions for the Clinical Approximation of Personality Dysfunction Severity - a Multimethod Study (Study III)

Participants and procedure. Between July 2020 and April 2022, $n = 285$ subjects were recruited from different centers in Germany ($n = 121$) and Basel (patients $n = 135$, NC $n = 29$). Informed consent, ethic approval, and in- and exclusion criteria followed Study II.

The German clinical sample completed a total of three self-report questionnaires (OPD-SQ, IPO-30, and LPFS-SR), and the SCID-5-AMPD-I and the STIPO-R, while the Basel mixed sample completed two self-report questionnaires (OPD-SQ and IPO-30) and the STiP-5.1.

(Semi)-Structured Interviews. In addition to the two PF interviews - STiP-5.1 and SCID-5-AMPD-I (see Study II), 57 patients of the German sample went through the STIPO-R (Clarkin et al., 2019), which is a semi-structured interview for the assessment of the level of PO. It contains domains of identity, object relations, defense mechanisms, aggression, moral

values, and narcissism. Responses are rated from “0 = absent” to “2 = present” and from “1 = no pathology” to “5 = severe pathology” for overall clinical rating.

Self-report questionnaires. The LPFS-SR and the IPO-16 are described in Study II. In Study III we used the IPO-30 (Hörz-Sagstetter et al., 2020), which is built on the same dimensions as the IPO-16. Additionally, we used the OPD-SQ (Ehrenthal et al., 2012), which assesses the eight OPD structure domains (self-perception, object perception, self-regulation, regulation of object relations, internal communication, communication with others, attachment capacity to internal objects, attachment capacity to external objects) among 95 items on a 5-point scale (“0 = not true at all” to “4 = fully true”).

Statistical analyses. Prior to the statistical analyses, we checked the distribution among the assessment dimensions and the distribution of PDS among the different samples. Further, we checked PDS scores for normality by histograms and identified scales with a skewness < 2 and kurtosis < 7 (West et al., 1995). Then, we merged the two PF interviews.

For the calculation of the method factor, we first investigated the unidimensionality of the assessments for PDS (total score of: SCID-5-AMPD-I and STiP-5.1 combined, STiPO-R, LPFS-SR, OPD-SQ, IPO-30) by parallel analysis. Further, we used exploratory factor analysis with the number of factors proposed in the parallel analysis. Second, we constructed a correlated trait-correlated method minus one (CT-C(M-1)) model (Eid et al., 2008) with a g-PDS loading on all dimensions of the interviews and self-reports, as well as on an orthogonal method factor only loading on self-report dimensions, extracting a method-adjusted g-PDS.

In a next step, we identified interview and self-report dimensions approximating the method-adjusted g-PDS. To determine the most approximating PDS dimension combinations, multiple linear regression models were calculated by sequentially including manifest scores of the respective PDS dimensions into the model. Then we used the latent, method-adjusted g-PDS as a dependent variable and manifest self-report and interview dimensions as an independent variable. The Best Items Scale that is Cross-validated, Unit-weighted, Informative and Transparent (BISCUIT; Elleman et al., 2021) algorithm was used to calculate bootstrapped correlations to identify the self-report PDS dimensions covarying highest with the method-adjusted g-PDS. Based on the ranking identified by the BISCUIT algorithm, we calculated multiple linear regression models by sequentially taking additional dimensions into the model. Correlations were interpreted according to Cohen (1992; see Study II). Model fit for the factor analytical models was assessed using the unbiased SRMR using a cutoff value of 0.1 times the

average R^2 of the manifest variables (Ximénez et al, 2022) to control for the CT-C(M-1) model used in our study (i.e., high average factor loadings and many parameters (Shi et al., 2018)).

4. Summary of Results

4.1. Somatization and Somatic Symptom Disorder and its Overlap with Dimensionally Measured Personality Pathology: A Systematic Review (Study I)

Eight studies ($n = 2979$, predominantly female) were included in our systematic literature search. Risk of bias across the studies, were random sequence generation, attribution, incomplete data reporting, and no blinding of participants. None of the eight studies included PD diagnoses according to DSM-5 AMPD. Nevertheless, alternative dimensional measures of personality were applied, showing some similarities to the Criterion A and B of the AMPD.

Regarding Criterion A, four studies ($n = 1741$) included measures for key functions of personality – the Temperament and Character Inventory (TCI; Cloninger et al., 1994), the Defense Style Questionnaire (DSQ; Andrews et al., 1993), the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003), and the Toronto Alexithymia Scale (TAS-20; Bagby et al., 1994). In relation with these questionnaires, results showed that somatizing patients show significant character impairments in self-directedness ($d = -0.673$, $p < 0.001$), cooperativeness ($d = -0.527$, $p < 0.001$), self-sacrificing ($d = 0.451$, $p < 0.001$) and self-criticizing defense mechanisms ($d = 0.292$, $p < 0.001$), impairments in identifying ($\eta_p^2 = .381$, $p < .001$) and describing own feelings ($\eta_p^2 = .315$, $p < .001$) compared to either CCs or HCs.

Regarding associations of somatization and Criterion B, three studies ($n = 2025$) revealed high correlations of somatization and neuroticism ($d = 0.22$, $p < 0.001$), ($d = 0.813$, $p < 0.0001$), ($d = 1.041$, $p < .003$). Self-defeating ($d = 0.892$, $p < 0.0001$), negativistic ($d = 0.694$, $p = 0.0005$), depressive ($d = 0.699$, $p = 0.0003$), harm avoidant ($d = 0.826$, $p < 0.0001$), ($d = 0.526$, $p < 0.001$), fatigable ($d = 1.146$, $p < 0.001$), low novelty seeking ($d = -0.366$, $p = 0.002$), low reward dependence ($d = -0.517$, $p < 0.001$), high sensitivity for anger ($d = 0.40$), and less investment in trust games ($d = 0.73$) showed significant associations with somatization compared to CCs or HCs. The Big Five domain agreeableness ($d = -0.372$, $p = 0.03$) was negatively associated with young and positively with elderly somatizing patients ($d = 0.018$, $p < .040$) compared to HCs.

Comorbidity between somatization and categorical PDs were found in 41-63% of SD/SSD patients with at least one comorbid PD. Most relevant correlations were found for paranoid ($p < 0.001$), ($d = 1.224$, OR = 9.2; 95% CI = 1.9–43.0) and obsessive-compulsive PD

($d = 1.006$, $OR = 6.2$, $95\% CI = 1.2-53.6$), ($d = 0.663$, $\chi^2 = 8.30$, $p = 0.004$). Other significant correlations were found between SD/SSD and borderline ($p = 0.001$), avoidant ($p = 0.009$), passive-aggressive ($p = 0.003$), and histrionic PD ($d = 0.706$, $OR = 3.6$; $95\% CI = 0.9-13.9$).

4.2. Evaluating the Psychometric Properties of the German Self and Interpersonal Functioning Scale (SIFS) (Study II)

Overall, subjects were aged $M = 37.2$ years old ($SD = 12.5$), of whom 425 (48.0%) were women. PF subscales differed significantly across the samples, with the Basel clinical sample showing highest PF impairment levels (56.3% met the criteria for PD according to the STiP-5.1), followed by the German clinical sample (33.3% met the criteria for PD according SCID-5-AMPD-I), the Clickworker sample, and the Basel non-clinical sample. Overall, the sample covered the full spectrum of PF.

Structure. The 24-item version of the SIFS revealed no good model fit. Due to low factor loading ($< .3$), item 6 (reversed) and item 10 (non-reversed) were excluded and led to a 22-item version, which increased fit indices of the estimated models.

The bifactor model with four specific uncorrelated factors (model 2) was chosen due to its homogenous loading pattern for the g-PD factor, an ECV of 59.6% for the g-PD factor, and a high reliability of the sum score ($\omega = .92$, $\omega_H = .81$), which was higher than for the bifactor model with two specific uncorrelated factors (model 1; $ECV = 52.9\%$, $\omega = .92$, $\omega_H = .68$). Therefore, model 2 was preferred despite its worse fit ($CFI = .847$, $TLI = .811$, $RMSEA = .088$, $SRMR = .080$). Nevertheless, internal consistency and specific-factor ECV for the four domains (model 2) was poor for ω_{HS} (identity $\omega_s = .88$, $\omega_{HS} = .31$; self-direction $\omega_s = .73$, $\omega_{HS} = .22$; empathy $\omega_s = .79$, $\omega_{HS} = .25$; and intimacy $\omega_s = .81$, $\omega_{HS} = .32$) and ECV (12.8% for identity, 6.4% for self-direction, 8.0% for empathy, and 13.2% for intimacy). Despite positive factor loadings on the g-PD factor and specific factors, some reverse-keyed items (8, 17, 19, 24) and item 16 showed factor loadings $< .40$ on the g-PD factor and item 21 had a negative factor loading on the specific factor intimacy. Therefore, we estimated the CFA models with a method factor for reversed items, which increased fit indices, but not the loading pattern.

Test-retest reliability. According to Pearson, test-retest-reliability for the sum score (22-item version) after two weeks ($n = 157$) was $r = .86$ ($95\% CI [.81, .89]$) and for the specific domains: $r = .85$ ($95\% CI [.80, .89]$) for identity, $r = .72$ ($95\% CI [.64, .79]$) for self-direction, $r = .77$ ($95\% CI [.69, .83]$) for empathy, and $r = .78$ ($95\% CI [.71, .84]$) for intimacy. Correlations were statistically significant ($p < .001$).

Convergent validity. Convergent validity analyses of the Clickworker sample ($n = 633$) revealed high correlations between the SIFS sum score (22-item version) and the LPFS-BF 2.0 ($r = .82, p < .001$), the IPO-16 ($r = .76, p < .001$), the BIT ($r = -.67, p < .001$), the PID5BF+M ($r = .50$ to $.73, p < .001$), except for PID5BF+M anankastia ($r = .38, p < .001$).

Overall ($n = 227$), strong correlation between the SIFS sum score and the four interview-based LPFS domains were found (between $.66$ and $.76, p < .001$), with the identity domain correlating largest ($r = .76, p < .001$).

The SIFS sum score correlated small to medium with the DSM-5 Section II PDs (according to SCID-5-PD), except for borderline ($r = .63, p < .001$), paranoid ($r = .53, p < .001$), avoidant ($r = .52, p < .001$) and schizotypal ($r = .51, p < .001$) PD. The SIFS sum score and obsessive-compulsive PD correlated smallest and not significant ($r = .15, p = .08$).

Comparing the four SIFS domains, the identity domain correlated significantly stronger with the sum score of the LPFS-BF 2.0 ($r = .82, p < .001$), the BIT ($r = -.67, p < .001$), the corresponding identity domain in the interview-based LPFS ($r = .75, p < .001$), and the borderline PD category ($r = .67, p < .001$), as well as with negative affectivity ($r = .70, p < .001$). The self-direction domain correlated stronger with disinhibition ($r = .56, p < .001$) and the intimacy domain with detachment ($r = .72, p < .001$). Other correlation differences between SIFS domains with external measures were not significant according to Zou (2007).

4.3. Determining Essential Dimensions for the Clinical Approximation of Personality Dysfunction Severity - a Multimethod Study (Study III)

Overall, subjects were aged $M = 29.3$ years old ($SD = 10.5$), of whom 65.0% were women. In total, 63.2% scored above the cutoff score for a PD according to Buer Christensen et al. (2019), indicating the presence of a PD, and 40.4% were using psychotropic medication. PDS subscales were normally distributed, except for the IPO domain aggression (skewness: 2.1 and kurtosis: 10.3), which was excluded for further analyses. Correlations between the LPFS interview total score and IPO-30 was medium ($r = .46$) and strong for LPFS-SR ($r = .78$), STIPO-R ($r = .79$), and OPD-SQ ($r = .68$).

Parallel analysis suggested to extract two factors; one with high loadings on self-reports and the other with high loadings on interviews. On the basis of this analysis, a CT-C(M-1) model, including a g-PDS defined by all assessments methods and an orthogonal method factor defined by self-reports, yielded a good model fit based on full information maximum likelihood estimation and 5000 bootstraps ($SRMR = .040$). To extract the g-PDS dimensions, a latent CT-C(M-1) model with the twelve LPFS subdomains each for interview and self-report, six

STIPO-R domains, four IPO domains, and eight OPD-SQ domains, including again an orthogonal method factor to extract self-reports to build the method-adjusted g-PDS. Accordingly, results for the method-adjusted g-PDS were reliable $ECV = 76.7\%$, $\omega_H = .84$).

All self-reported PDS dimensions revealed at least medium method variance, i.e., standardized factor loadings $> .30$ on the method factor, except for the LPFS-SR empathy subdomains: *understanding of effects of own behavior on others*, and *understanding and appreciation of experiences and motivations of others*, the LPFS-SR intimacy subdomain *depth and duration of connections*, and the IPO domain *moral values* ($< .30$). The eight OPD-SQ domains and the three identity LPFS-SR subdomains, as well as the self-direction LPFS-SR subdomain *constructive and prosocial internal standards of behavior* revealed large method variance with standardized factor loadings $> .50$ on the method factor. The IPO domains *primitive defense mechanisms*, *aggression*, and *reality testing*, as well as the OPD-SQ domains *self-perception*, *self-regulation*, *regulation of object relations*, *communication to others*, and *attachment capacity to external objects* loaded stronger on the method factor than on the g-PDS. Low correlations were found between the method-adjusted g-PDS and the IPO-30 domain *reality testing* ($r = .31$), and the LPFS-SR self-direction subdomain *ability to pursue meaningful short- and long-term goals* ($r = .40$), which were therefore omitted.

The four interview dimensions - STIPO-R domain *defense mechanisms*, the LPFS intimacy subdomain *desire and capacity for closeness*, the LPFS identity subdomain *sense of self with boundaries to others*, and the LPFS empathy subdomain *understanding and appreciation of experiences and motivations of others* - were found to approximate the latent g-PDS best with each dimension correlating $> .80$. Combining two of these dimensions can explain between 81.8% (*sense of self with boundaries to others* and *defense mechanisms*) and 91.3% (*desire and capacity for closeness* and *defense mechanisms*). Regarding the approximation of the g-PDS with self-report dimensions, the LPFS-SR intimacy subdomain *depth and duration of connections*, and the identity subdomain *emotional range and regulation* explained 69.5% of variance. Including further dimensions increased the ECV to 74.9%.

5. General Discussion

The first goal of this thesis was to explore and emphasize the relevance of personality pathology in other mental disorders, such as in somatization (Study I). Given that in acute clinical presentation, the assessment for personality pathology is limited as difficulties in describing one's thoughts, feelings, behaviors, and interpersonal problems are intertwined with other acute mental health issues, as depressive, anxiety or somatization symptoms, clinicians

tend to overlook personality pathologies (Triebwasser & Shea, 1996). To this logic, the further aims of this thesis were to support the operationalization of the dimensional approach of PF by the means of a German self-report (Study II) and to empirically approximate the g-PDS core dimensions that should be emphasized on for the use in time-limited settings (Study III).

The results of study I showed that PDs and personality dysfunctions are often comorbid in subjects suffering from somatization (41-63% of SD/SSD patients showed at least one comorbid PD, Study I), but categorical PD diagnosis, such as those of the ICD-10, provide only little diagnostic information. However, applying the dimensional PD approaches revealed high associations with somatization in the self-functioning domain of PF, negative affectivity, harm avoidance, and self-defeating traits, although the AMPD or ICD-11 approaches were yet not applied in one of the included studies. Beside the fact that these models are still relatively young, the reason for this reluctance may be due (1) the fact that clinicians are often more familiar with previous Axis I disorders and lack knowledge about PDs, (2) the misinterpretation of PDs as an untreatable disorder (at least in terms of medication, which is increasingly dominant in clinical practice), (3) fear of stigma (Paris, 2007), and (4) lack of institutional support combined with fear of moving to an unfamiliar system (Brown et al., 2023).

Therefore, besides knowledge about the dimensionality of PDs, an easy applicable instrument for the operationalization of PF was validated within the scope of this thesis. Findings, of the German 22-item version of the SIFS however showed mixed results with regard to its structural (ECV g-PD factor = 59.6%, $\omega_H = .81$), test-retest ($r = .86$ (95% CI [.81, .89]), and convergent (correlations between the SIFS sum score and the interview-based LPFS global score based on STiP-5.1 and SCID-5-AMPD-I: $r = .76$) validity (Study II). In particular, the results on structural validity are in contrast to existing evidence on PF, which shows a homogeneous loading pattern of the four domains and a strong g-PD factor (e.g., Morey, 2017; Weekers et al., 2019; Zimmermann et al., 2023a). Based on the result of a unidimensional factor structure of PF, study III revealed that for the approximation of a latent method-adjusted g-PDS, two interview dimensions of PDS (randomly combined between STIPO-R domain *defense mechanisms*, LPFS intimacy subdomain *desire and capacity for closeness*, LPFS identity subdomain *sense of self with boundaries to others*, and LPFS empathy subdomain *understanding and appreciation of experiences and motivations of others*) could already explain between 81.8% and 91.3% of the latent g-PDS variance. The approximation of the latent interview scores with self-report dimensions also points strongest to identity and intimacy dimensions.

5.1. Somatization and Somatic Symptom Disorder and its Overlap with Dimensionally Measured Personality Pathology: A Systematic Review (Study I)

Although dimensional personality dysfunction approaches from AMPD and ICD-11 are neglected in the field of somatization and most recent studies still focus on categorical PD diagnosis in somatization (e.g. Sandoval & Ayala, 2024; Espiridon & Kerbel, 2020), we were able to associate personality dysfunctions and maladaptive trait domains using the DSQ, ERQ, TAS-20, and TCI. Accordingly, we found that somatizing patients compared to patients without somatization show personality pathologies regarding the self-functioning domain of self-direction and the interpersonal domain of cooperativeness, which the latter can be aligned to the AMPD empathy and intimacy domain. Both domains were found to be a strong predictor (75.8%) for categorical PD according to DSM-IV (Conrad et al., 2007), whereas a more recent study showed stronger effect sizes for the self-domain compared to the interpersonal domain with regard to somatization (Sleep et al., 2020), which can be aligned with our results of high expression of self-sacrificing and self-criticizing defense mechanisms in somatizing patients (Hyphantis et al., 2013). These results may best be associated with the self-esteem subdomain of the identity domain. Additionally, also the results of restricted emotion processing (Erkic et al., 2018; Pedrosa et al., 2009) can be allocated to the identity subdomain of emotional range and regulation. Moreover, impairments in emotion identification and description are directly associated to high alexithymia scores (Erkic et al., 2018), but also show associations to low cooperativeness and self-reflection (Simonsen et al., 2020). This interplay between the distortion of emotion processing (self-domain) with the result of increased bodily sensations and illness feelings may lead to less trust in social interactions (interpersonal domain), which in turn influences the self-domain. Thus, within the scope of somatization, we could show that there is a body of evidence pointing to the comorbidity with PF of the AMPD, although the (sub-)domains cannot be strictly separated, which is in line with previous studies supporting a g-PD factor. These results can also be reflected in current psychodynamic theories, highlighting three impaired key systems – attachment, epistemic trust, and mentalization – in SD/SSD patients (Luyten & Fonagy, 2020), all of which can be associated with PF (e.g., Bender et al., 2011, Levy et al., 2013), emphasizing the link between adverse childhood experiences, PF, and somatization in particular (Kerber et al., 2023).

Regarding the maladaptive trait domains, two recent studies included dimensional PD models in relation to somatization, indicating a strong relationship between both maladaptive trait domains and temperament with somatization, and a slightly higher contribution for

predisposed temperament systems (Rezaei et al., 2023; Komasi et al., 2023). However, incorporating psychodynamic theories, PF and maladaptive trait domains are influenced by the interaction of biological temperament and the experienced environment/caregiving interactions (e.g., Fleck, 2021). Therefore, PF, maladaptive trait domains, and temperament should not be seen as separate constructs. In our results, high scores for harm avoidant temperament were found in somatizing patients, which relates to categorical Cluster A (fearful) PD and can be associated with impaired self-direction, negative affectivity, and anxiety, as these aspects show high shared variance (Rezaie et al., 2020; Aluja & Blanch, 2011). The strong relationship between somatization and neuroticism/negative affectivity (Criterion B of the AMPD) (Hyphantis et al., 2013; Noyes et al., 2001; van Dijk et al., 2016) has been interpreted to a provisional placement of the somatoform spectrum, which could also be accommodated within the internalizing HiTOP spectrum. However, a recent study (Woodling et al., 2022) argues in favor of a separate somatoform spectrum within complex, dimensional models of hierarchical psychopathology. This study highlights the importance of a differentiated approach to the diagnosis and treatment of somatization pathology; however, the confounding variables (e.g., other mental disorders or age) indicate the complexity of this issue. For example, our results showed lower agreeableness scores in young somatizing patients and higher agreeableness scores in older somatizing patients compared to a CC (Noyes et al., 2001; van Dijk et al., 2016). This might be associated with the fact that pain may be expected and accepted as a consequence of aging in elderly somatizing patients, causing less psychological distress and thus less impaired agreeableness scores (van Dijk et al., 2016). Despite the placement of the somatoform spectrum within HiTOP, recent research reinforces transdiagnostic approaches that support not only the dimensionality of personality pathology but also that of somatization by attempting to assess differences in the degree rather in the kind of somatization (Hartmann et al., 2022).

5.2. Evaluating the Psychometric Properties of the German Self and Interpersonal Functioning Scale (SIFS) (Study II)

The 24-item version of the SIFS was not conform to a bifactor structure, consisting of a strong g-PD factor (in comparison to LPFS-SR and LPFS-BF), considering PF as an essentially unidimensional construct (Bliton et al., 2022). In particular, the reversed item 6 (“I recognize myself in the way other people describe me”) and the rather verbosely written item 10 (“My actions and decisions are determined by my immediate needs, independently of everything else”) showed low factor loadings on the g-PD factor in the bifactor model with four uncorrelated specific factors (model 2). The psychometric properties of item 6 and 16 (“I

have little interest for other people's feelings or problems") had already shown problems in the French version, but were still retained for representing the subdomain *stability and accuracy of self-esteem* (item 6) or for reasons of relevance to the forensic setting (item 16; Gamache et al., 2019). In our study, reiterating the CFA models excluding items 6 and 10 items revealed a close to acceptable fit for bifactor models with two or four uncorrelated, specific factors (model 1 and 2). Nevertheless, the loading pattern of the items was very heterogeneous (small and negative loadings on the g-PD factor). Additionally, poor reliability (identity $\omega_s = .88$, $\omega_{Hs} = .31$; self-direction $\omega_s = .73$, $\omega_{Hs} = .22$; empathy $\omega_s = .79$, $\omega_{Hs} = .25$; and intimacy $\omega_s = .81$, $\omega_{Hs} = .32$) for the specific factors was found. This is crucial as a well-established bifactor model should also reveal substantial loadings on the g-PD factor, adequate reliability (i.e., ω , ω_H), as well as reasonable ECV in addition to model fit (Watts et al., 2019). One reason for the poor structural validity, may include the mix of non-reversed and reversed items in the same test, which may indeed safeguard against response bias (e.g., acquiescence) and improve domains' content coverage, but also it bears the risk of reduced reliability as the secondary sources of variance may compromise the unidimensionality of the test (e.g., due to careless responding; Woods, 2006). Therefore, a revised, but not yet validated version of the original SIFS with 20-items and excluded items with reversed wordings was proposed by Leclerc et al., 2021). In our CFA models, the inclusion of a method factor for the reversed items increased the model fit, but the ECV, internal consistency and factor loadings still showed problems of the items wording not only specific for the German version.

Besides poor structural validity, the convergent validity with well-validated self-reports on PF and PO was high, which could also refer to shared unspecified variance (e.g., momentary distress or common method bias; Podsakoff et al., 2003). Nevertheless, by ruling out common method bias by using two (semi-)structured interviews to assess PF, results confirmed high correlations between the SIFS sum score and the four PF domains (respectively twelve subdomains), being in line with previous studies (e.g., Somma et al., 2020; Heissler et al., 2021; Ohse et al., 2022). Of note, the SIFS identity domain showed significantly higher correlations with external criteria, highlighting the identity domain either as a strong marker for PDS or as not enough discriminant with the trait domain negative affectivity. The latter would be in line with our results showing higher correlations between SIFS identity and negative affectivity compared to the other trait domains, which is also consistent with the finding of Oltmanns & Widiger (2016). However, the specific domains revealed no overall additional benefit to the sum score, as no distinct correlation patterns with the corresponding external criteria were found.

Further high convergent validity between the SIFS sum score and the Criterion B trait domains was in line with recent studies (e.g., Gamache et al., 2019; Waugh et al., 2021). An exception was found for the additional ICD-11 anankastia trait domain, showing weak correlations with the SIFS sum score, which was already found in previous studies (e.g., McCabe & Widiger, 2020; Zimmermann et al., 2023a). This might be to the complex nature of anankastia, capturing also adaptive facets (e.g., deliberativeness), or the formulation of the anankastia items may be too adaptive, not capturing the pathological character of anankastia (Zimmermann et al., 2023a). Similarly, obsessive-compulsive PD in DSM-5 Section II showed a weak relationship with the SIFS sum. In contrast, borderline PD was highly correlated with the SIFS sum, which can be reconciled with studies suggesting borderline PD as a strong marker for the level of PF impairments (e.g., Sharp et al., 2015). Furthermore, the strongly negative association between the construct of well-being and the SIFS sum is in line with previous studies (Gamache et al., 2019).

5.3. Determining Essential Dimensions for the Clinical Approximation of Personality Dysfunction Severity - a Multimethod Study (Study III)

In identifying core personality pathologies for time-limited practice, our results indicate that three interview-assessed PF subdomains and the interview-assessed PO domain of defense mechanism approximate the latent method-adjusted g-PDS closest. The self-reported dimensions of identity and intimacy as well as the OPD domain of object perception also showed a high variance explanation of the latent method-adjusted g-PDS.

First, the interview LPFS intimacy subdomain *capacity and desire for closeness*, and the LPFS self-report intimacy subdomain *depth and duration of connections* emerged as core dimensions of PDS within our results. Both support the importance of objects relations, including the observer rating concepts of the quality of object relation theory, an essential aspect of the LPFS construction in the DSM-5 AMPD (Bender et al., 2011). These results are consistent with long-standing studies on the Social Cognition and Object Relation Scale (e.g., Westen et al., 1990) that emphasize the strong association of the aspect *capacity for emotional investment in relationships* and PD. According to object relations theory, the development of a PD is based on the interaction between temperament and environmental factors. Thus, negative affect experiences in early interactions may lead to internal overrepresentations of maladaptive self- and other concepts predominated by negative affect, which, if left untreated, adversely affects future intimate relationships (Kernberg & Caligor, 2005). This

long-standing theory is supported by more recent findings, showing strong associations of attachment-related impairments in intimate relationships and PD (Levy et al., 2015; Lorenzini & Fonagy, 2013) or general psychopathology (Mikulincer & Shaver, 2012). In line with our findings, recent studies (Hopwood, 2018; Pincus et al., 2017) argue for replacing the term PD with interpersonal disorders to emphasize the importance of the relationship dysfunction etiology and symptomatology directly within the disorder's name.

Second, closely aligned with object relations and interpersonal dysfunctions in PD are immature *defense mechanisms* such as splitting, denial, acting out, and devaluation, which challenge not only close relationships but also the therapeutic working alliance (Siefert & Porcerelli, 2015). Moreover, our results have shown that *defense mechanisms* are highly predictive for the approximation of the g-PDS, which aligns with recent findings showing immature *defense mechanisms* to be strongly correlated with psychopathology in a large representative sample (Blanco et al., 2023). In general, *defense mechanisms* represent unconscious coping mechanisms to deal with within-person conflicts, which can be aligned on a spectrum from mature levels (such as humor or intellectualization) or immature forms (Cramer, 2015). This is also consistent with the concept of PO, which was also very influential for the conceptualization of PF in the DSM-5 AMPD (Bender et al., 2011) and which includes *defense mechanisms* as a strong indicator of PDS (Hörz-Sagstetter et al., 2018; Kernberg, 2004). Moreover, the latest revision of OPDS PS axis included *defense mechanisms*, associating low PS (i.e., high PDS) with immature *defense mechanisms* (OPD Task Force, 2023). Additionally, since our results reveal a high discrepancy between the ECV of interview-assessed STIPO-R defense mechanisms and self-rated IPO-30 domain primitive defense, we assumed that *defense mechanisms* is a construct can be best assessed by experienced clinicians, as subtleties of defense patterns may not be captured by a short self-report method.

Third, the interview-assessed LPFS subdomain *sense of self with boundaries to others* was another PDS dimensions covering large amount of ECV of the method-adjusted g-PDS, which is associated to existing evidence showing a strong relationship between the identity domain and PDS (Bogaerts et al., 2021; Kampe & Hörz-Sagstetter, 2022). In addition, our findings promote also the two remaining interview-assessed LPFS identity subdomains (*stability and accuracy of self-esteem* and *emotional range and regulation*) as well as the STIPO-R identity domain dimensions loading strongly on the g-PDS ($r > .65$). Nevertheless, if these dimensions are added to the LPFS subdomain *sense of self with boundaries to others* in a sequential regression model, only little additional variance is explained, indicating that the

this subdomain is highly covered in the frameworks of PF and PO, referring to a differentiated and coherent experience of an authentic and vital subject with boundaries to others. Moreover, in DSM-5 and ICD-10, four of the nine borderline PD criteria refer directly to impairments in *sense of self* (unstable self-image and sense of self, affective instability, chronic feeling of emptiness, dissociative symptoms), and are also found to be central predictors of general psychopathology (Gluschkoff et al., 2021). Like the domain of *defense mechanisms*, also the subdomain *sense of self with boundaries to others* revealed moderate to strong method variance, indicating a clinician based assessment. Nonetheless, the self-reported subdomain *emotional range and regulation* showed high variance explanation for the latent method-adjusted g-PDS, suggesting that this subdomain is nevertheless a reliable self-report indicator for PDS.

Fourth, the interview-assessed subdomain *understanding and appreciation of experiences and motivations of others* and the self-reported subdomain *understanding of effects of own behavior on others* showed to be important for explaining the variance of the g-PDS. This result is consistent with recent evidence found that empathy impairment are a marker of general personality pathology (Ohse et al., 2023). This LPFS domain stems from the concept of mentalization (Bender et al., 2011), which describes the ability to understand one's own mental states and those of others, encompassing feelings, thoughts, and motives, and is highly associated with PD and general psychopathology (Luyten et al., 2024; Luyten & Fonagy, 2022). This could also be reflected in our results, showing high ECV of the method-adjusted g-PDS with the self-reported OPD-SQ domain *object perception*, which also includes mentalization abilities. Furthermore, impairments in empathy appear to be traced back on disadvantageous interplay with identity diffusion, i.e., a risk of emotional contagion of one's own emotions triggered by the emotions of others, which prevents genuine comprehension of others (Jeung & Herpertz, 2014) illustrating the interplay of the subdomains within our findings (e.g., *sense of self with boundaries to others and understanding and appreciation of experiences and motivations of others*).

In summary, three out of the four most central dimensions for the clinical approximation of the PDS found in our study may not need extensive training to be reliably assessed by a clinician or even lay-raters (Garcia et al., 2018), nor psychodynamic knowledge to capture the essence of these subdomains (Prete et al., 2018). However, psychodynamic background and experience are required to reliably assess the concept of defense mechanisms. Therefore, it may be worthwhile to get training in the assessment of defense mechanisms in terms of treatment

and idiosyncratic case plaining beyond the ICD-11 and DSM-5 AMPD comprehension of PDS. Furthermore, PDs are prevalent and comorbid in mental health care (Tyrer & Mulder, 2022) with PDS subdomains of identity diffusion and interpersonal impairments being highly predictive of general psychopathology (Gluschkoff et al., 2021). To assess the four dimensions found in our results, following interview questions may be helpful.

- For “the degree to which the individual experiences itself as unique with clear boundaries between self and others” (APA, 2013; LPFS identity subdomain *sense of self with boundaries to others*) the question “How would you describe yourself as a person?” and “To what extent do your feelings about yourself fluctuate?” (STiP-5.1; Hutsebaut et al., 2017).
- For “the need for, and ability to achieve, emotional and psychological closeness with others” (APA, 2013; LPFS intimacy subdomain *desire and capacity for closeness*) the question “Are you close to a number of people in your life?” and “Do the people you form relationships with inevitably hurt or disappoint you?” (SCID-5-AMPD-I; Bender et al., 2018).
- For “the degree to which the individual comprehends and appreciates others’ experiences and motivations” (APA, 2013; LPFS empathy subdomain *understanding and appreciation of others’ experiences and motivations*), the questions “Do you usually know what makes other people tick and why they do the things they do?” and “Is it hard for you to understand why people do things that hurt or upset you?” (SCID-5-AMPD-I; Bender et al., 2018) may be helpful.
- For “conscious, subjective affective, cognitive and behavioral correlates of primitive defense mechanisms” (Doering et al., 2013) the question “Have people pointed out that you tend to blame others or circumstances, for things that happen to you, or that you have difficulty accepting responsibility for your actions?” (STIPO-R; Clarkin et al., 2019) could be helpful.

5.4. Strengths and Limitations

To our knowledge, Study I was the first systematic review to focus on the overlap of somatization and dimensionally measured personality pathology, as is the case in the DSM-5 AMPD, although none of the included studies used the AMPD model. Besides a relatively high number of included subjects, and a specific and sensitive search strategy, we also followed strict inclusion criteria (e.g., control group, disorder specific assessments for both, somatization

and personality, and English-language articles only). In addition, on a study-level, a diagnostic interview was conducted in seven out of eight studies to confirm psychiatric diagnosis for either somatization or PD. However, the strict inclusion criteria also carry the risk of overlooking a large amount of evidence. In addition, the heterogeneous results and study designs were not suitable for conducting a meta-analysis. Furthermore, on a study-level, all included studies were missing randomization, a study protocol, and subjects were not blind to their condition. Moreover, the included subjects also had other comorbid mental disorders, and other confounding factors such as demographics were ignored, so the risk of attribution bias is likely.

In Study II, for the first time the psychometric properties of the SIFS were evaluated among the entire spectrum of PF across different samples, using a multi-method design. While we used the English version for translating the German version, deviated from the originally validated French version, we compared the items to the French version and received approval for our German version from the author of the SIFS. Further, the Clickworker sample was limited to self-report only, so there is a risk that this sample is not fully nonclinical. In addition, no clinical diagnoses apart from PDs were assessed for the clinical samples, and representativeness for the general population was not ensured with the NC data (Clickworker and Basel NCs). Moreover, variables for careless responding were not included in the self-report battery in the German clinical and the Basel sample, and inter-rater reliability between the STiP-5.1 interviewers was missing in the Basel sample, although all interviewers were experienced in dimensional PD assessment with respect to the PS axis of OPD-2. In addition to only a small test-retest subsample ($n = 157$), the discriminant validity of the SIFS sum score was not investigated, which is also challenging as most clinical constructs will be positively correlated with PF (Zimmermann et al., 2023b). Most importantly, given our results, the content of the SIFS items need to be adjusted, which was already a finding of a study by Leclerc and colleagues (2021), which was not available at the time of our data collection.

In Study III, we investigated core dimensions of PDS, using the full spectrum of PDS in a multi-method design, using six highly validated (semi-)structured interviews and self-reports for PF, PO, and PS. Nevertheless, as the interviews followed a chronological order, predictive power of specific PDS dimensions should be considered with caution, since implicit knowledge about a subject gained in one domain could be used in the rating of another. Moreover, since we used interview dimensions for the prediction of the g-PDS, which was based on these interviews, the explained variance found for the interview-assessment of the g-PDS in the multiple regression is inflated. However, interview-assessed as well as self-reported LPFS intimacy subdomains correlated highest with the g-PDS, suggesting that it is not an

artifact of assessment or modeling method. Regarding the STIPO-R interviews, only a small sample was assessed, nevertheless normality and distribution of the data was given. Regarding the OPD PS axis, an interview counterpart for the construction of the method-adjusted model was lacking, leading probably to specific variance of the OPD self-report in the method factor and an underrepresentation in the method adjusted g-PDS. Nevertheless, one OPD domain (object perception) was largely correlating with the g-PDS. Additional limitations regarding the inter-rater reliability in the Basel sample are described above in Study II.

5.5. Conclusions and Implications for Future Research and Clinical Routine

Despite these limitations, the implementation of a dimensional assessment of PDS in ICD-11 and DSM-5 AMPD represents a crucial step towards an empirically based model for the diagnosis of PD with transdiagnostic utility. Results of this thesis – that PDs and personality pathologies in somatizing patients are frequently overlooked and categorical PDs approaches reveal only little diagnostic information – underlines the importance of the use of dimensional PD approaches. Applying the AMPD to somatizing patients, our review found impairments in the self-domain of PF and the negative affectivity trait domain most robust. To date, research applying the AMPD approach to somatizing patients are unsatisfying. We therefore propose to apply the AMPD/ICD-11 approach in clinical practice to establish a link between the patient's bodily sensations, and personality dysfunction as well as maladaptive trait domains on the basis of attachment and mentalization theories. Therefore, we expect a reduction of stigmatization in SSD (Heathcote, 2019) and that this will foster better treatment of the patient's misinterpretation-routed physiological sensations, as well as strengthen the therapeutic relationship.

Therefore, a further aim was to operationalize PF with an easy applicable German self-report questionnaire, the SIFS. The results regarding the psychometric properties revealed high test-retest and convergent validity with other well-validated self-report questionnaires and two (semi-)structured interviews for the assessment of PF. However, the structural validity showed no benefit of the even shortened 22-item SIFS version compared to other existing PF self-report questionnaires (e.g., LPFS-SR or LPFS-BF2.0). Therefore, we suggest fundamental revisions regarding the formulation of items, as well as the exclusion of item reversion, which may lead to better factor analytical fit indices, ECV, reliability of the g-PD factor as well as to a more consistent loading pattern on the g-PD factor and the specific factors. In a further step, we recommend to evaluate the revised SIFS version (proposed by Leclerc et al., 2021) in a multi-

method design. However, using the German version of the SIFS in the clinical context for an impression of a global PF score may still be advisable.

Moreover, to truly capture the core of PDS, diagnostic interviews are a necessity, but clinicians typically face challenges regarding time constraints for thorough diagnosis and are overwhelmed with the choice of instruments developed for assessing PDS according to ICD-11 (for an overview see Bach & Mulder, 2022) and DSM-5 AMPD (for an overview see Zimmermann et al., 2023b). Therefore, the aim of this study was to identify interview core dimensions of PDS based on theoretical concepts of PF, PO, and PS, which align with a method-adjusted g-PDS. The four interview-assessed dimensions- *defense mechanisms* (STIPO-R), *desire and capacity for closeness* (LPFS domain intimacy), *sense of self with boundaries to others* (LPFS domain identity), and *understanding and appreciation of experiences and motivations of others* (LPFS domain empathy) showed high convergence with a method-adjusted g-PDS. In addition, also the self-reported PDS dimensions as *depth and duration of connections*, *understanding of effects of own behavior on others* and *OPD object perception* explained 69.5% of the latent, method-adjusted g-PD variance. Overall, the results of study III suggest that at least two these three LPFS interview dimensions, which do not require extensive training, should be assessed when time is limited, and that further psychodynamic theories of defense mechanisms could be an important addition for PDS based on DSM-5 or ICD-11. Finally, future studies should examine the improvement and utility of incorporating psychodynamic theories behind PF could for case conceptualizations.

6. References

- Allport, G. W., & Odbert, H. S. (1936). Trait-names: A psycho-lexical study. *Psychological monographs*, 47(1), i.
- Aluja, A., & Blanch, A. (2011). The five and seven factors personality models: differences and similitude between the TCI-R, NEO-FFI-R and ZKPQ-50-CC. *Span J Psychol*, 14(2), 659-666. https://doi.org/10.5209/rev_sjop.2011.v14.n2.14
- American Psychiatric Association. (1968). *Diagnostic and Statistical Manual of Mental Disorders*. 2nd ed. Washington, DC: American Psychiatric Association.
- American Psychiatric Association. (1980). *Diagnostic and Statistical Manual of Mental Disorders*. 3rd ed. Washington, DC: American Psychiatric Association.
- American Psychiatric Association. (1994). *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed. Washington, DC: American Psychiatric Association.
- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders*. 5th ed. Washington, DC: American Psychiatric Publication.
- Andrews, G., Singh, M., & Bond, M. (1993). The Defense Style Questionnaire. *Journal of Nervous and Mental Disease*, 181(4), 246-256. <https://doi.org/10.1097/00005053-199304000-00006>
- Arslan, R. C., Walther, M. P., & Tata, C. S. (2019). formr: A study framework allowing for automated feedback generation and complex longitudinal experience-sampling studies using R. *Behavior research methods*, 52(1), 376-387. <https://doi.org/10.3758/s13428-019-01236-y>
- Bach, B., Kerber, A., Aluja, A., Bastiaens, T., Keeley, J., Claes, L., Fossati, A., Gutierrez, F., Oliveira, S. E. S., Pires, R., Riegel, K. D., Rolland, J., Roskam, I., Sellbom, M., Somma, A., Spanemberg, L., Strus, W., Thimm, J., Wright, A.G.C., Zimmermann, J. (2020). International Assessment of DSM-5 and ICD-11 Personality Disorder Traits: Toward a Common Nosology in DSM-5.1. *Psychopathology*. <https://doi.org/10.1159/000507589>
- Bach, B., & Mulder, R. (2022). Clinical implications of ICD-11 for diagnosing and treating personality disorders. *Current Psychiatry Reports*, 24(10), 553-563. <https://doi.org/10.1007/s11920-022-01364-x>

- Bagby, R. M., Parker, J. D., & Taylor, G. J. (1994). The twenty-item Toronto Alexithymia Scale—I. Item selection and cross-validation of the factor structure. *Journal of psychosomatic research*, 38(1), 23-32.
- Beckwith, H., Moran, P. F., & Reilly, J. (2014). Personality disorder prevalence in psychiatric outpatients: a systematic literature review. *Personality and mental health*, 8(2), 91-101. <https://doi.org/10.1002/pmh.1252>
- Beesdo-Baum, K., Zaudig, M., & Wittchen, H. U. (2019a). *SCID-5-PD. Strukturiertes Klinisches Interview für DSM-5®–Persönlichkeitsstörungen. [German version of the Structured Clinical Interview for DSM-5 Disorders®–Personality Disorders by Michael B. First, Janet BW Williams, Lorna Smith Benjamin, Robert L. Spitzer]*. Hogrefe.
- Beesdo-Baum, K., Zaudig, M., & Wittchen, H. U. (Eds.). (2019b). *SCID-5-CV Strukturiertes Klinisches Interview für DSM-5-Disorders®–Klinische Version [German version of the Structured Clinical Interview for DSM-5 Disorders®–Clinician Version by Michael B. First, Janet BW Williams, Rhonda S. Karg, Robert L. Spitzer]*. Hogrefe.
- Bender, D. S., Morey, L. C., & Skodol, A. E. (2011). Toward a Model for Assessing Level of Personality Functioning in *DSM–5* , Part I: A Review of Theory and Methods. *Journal of Personality Assessment*, 93(4), 332–346. <https://doi.org/10.1080/00223891.2011.583808>
- Bender, D., Skodol, A., First, M., & Oldham, J. (2018). *Module I: Structured Clinical Interview for the Level of Personality Functioning Scale*. American Psychiatric Association.
- Blanco, C., Kampe, L., Wall, M. M., Liu, S.-M., Wang, S., Caligor, E., & Olfson, M. (2023). Approximating defense mechanisms in a national study of adults: Prevalence and correlates with functioning. *Translational Psychiatry*, 13(1), 21. <https://doi.org/10.1038/s41398-022-02303-3>
- Bliton, C. F., Roche, M. J., Pincus, A. L., & Dueber, D. (2022). Examining the structure and validity of self-report measures of DSM-5 alternative model for personality disorders Criterion A. *Journal of personality disorders*, 36(2), 157-182. https://doi.org/10.1521/pedi_2021_35_531

- Blüml, V., & Doering, S. (2021). ICD-11 personality disorders: a psychodynamic perspective on personality functioning. *Frontiers in Psychiatry, 12*, 654026.
<https://doi.org/10.3389/fpsyt.2021.654026>
- Bogaerts, A., Luyckx, K., Bastiaens, T., Kaufman, E. A., & Claes, L. (2021). Identity Impairment as a Central Dimension in Personality Pathology. *Journal of Psychopathology and Behavioral Assessment, 43*(1), 33–42.
<https://doi.org/10.1007/s10862-020-09804-9>
- Brown, T. A., Sellbom, M., Bach, B., & Newton-Howes, G. (2023). New Zealand (Aotearoa) clinicians' perspectives on the utility of the ICD-11 personality disorder diagnosis. *Personality and Mental Health, 17*(3), 282-291.
<https://doi.org/10.1002/pmh.1582>
- Brunner, M., Nagy, G., & Wilhelm, O. (2012). A tutorial on hierarchically structured constructs. *Journal of personality, 80*(4), 796-846. <https://doi.org/10.1111/j.1467-6494.2011.00749x>
- Buer Christensen, T., Hummelen, B., Paap, M. C. S., Eikenaes, I., Selvik, S. G., Kvarstein, E., Pedersen, G., Bender, D. S., Skodol, A. E., & Nysæter, T. E. (2019). Evaluation of Diagnostic Thresholds for Criterion A in the Alternative *DSM-5* Model for Personality Disorders. *Journal of Personality Disorders, 1*–22.
https://doi.org/10.1521/pedi_2019_33_455
- Clark, L. A. (2007). Assessment and diagnosis of personality disorder: perennial issues and an emerging reconceptualization. *Annu Rev Psychol, 58*(1), 227-257.
<https://doi.org/10.1146/annurev.psych.57.102904.190200>
- Clarkin, J., Foelsch, P. A., & Kernberg, O. F. (1995). *The inventory of personality organization (IPO)*. Weill Medical College of Cornell University
- Clarkin, J. F., Caligor, E., Stern, B., & Kernberg, O. F. (2019). *Manual for the Structured Interview of Personality Organization (STIPO-R)*. Weill Medical College of Cornell University.
<https://www.borderlinedisorders.com/assets/STIPORmanual.July2019FINALMod.pdf>
- Cloninger, C. R., Przybeck, T. R., Svrakic, D. M., & Wetzel, R. D. (1994). The Temperament and Character Inventory (TCI): A guide to its development and use.

- Cohen, J. (1992). A power primer. *Psychological bulletin*, *112*(1), 155-159.
<https://doi.org/10.1037/0033-2909.112.1.155>
- Conrad, R., Schilling, G., Bausch, C., Nadstawek, J., Wartenberg, H. C., Wegener, I., Geiser, F., Imbierowicz, K., & Liedtke, R. (2007). Temperament and character personality profiles and personality disorders in chronic pain patients. *Pain*, *133*(1-3), 197-209.
<https://doi.org/10.1016/j.pain.2007.07.024>
- Costa, P. T., & McCrae, R. R. (1992). Normal personality assessment in clinical practice: The NEO Personality Inventory. *Psychological assessment*, *4*(1), 5.
<https://doi.org/10.1037/1040-3590.4.1.5>
- Cramer, P. (2015). Understanding Defense Mechanisms. *Psychodynamic Psychiatry*, *43*(4), 523–552. <https://doi.org/10.1521/pdps.2015.43.4.523>
- Crocq, M. A. (2013). Milestones in the history of personality disorders. *Dialogues in clinical neuroscience*, *15*(2), 147-153. <https://doi.org/10.31887/DCNS.2013.15.2/macrocq>
- D'Huart, D., Stepan, M., Seker, S., Bürgin, D., Boonmann, C., Birkhölzer, M., ... & Schmeck, K. (2022). Prevalence and 10-Year Stability of Personality Disorders From adolescence to Young Adulthood in a High-Risk Sample. *Frontiers in psychiatry*, *13*.
<https://doi.org/10.3389/fpsyt.2022.840678>
- Doering, S., Burgmer, M., Heuft, G., Menke, D., Bäumer, B., Lübking, M., ... & Schneider, G. (2013). Reliability and validity of the German version of the Structured Interview of Personality Organization (STIPO). *BMC psychiatry*, *13*, 1-13.
<https://doi.org/10.1186/1471-244X-13-210>
- Ehrenthal, J. C., Dinger, U., Horsch, L., Komo-Lang, M., Klinkerfuss, M., Grande, T., & Schauenburg, H. (2012). The OPD Structure Questionnaire (OPD-SQ): first results on reliability and validity. *Psychotherapie, Psychosomatik, Medizinische Psychologie*, *62*(1), 25-32. <https://doi.org/10.1055/s-0031-1295481>
- Eid, M., Nussbeck, F. W., Geiser, C., Cole, D. A., Gollwitzer, M., & Lischetzke, T. (2008). Structural equation modeling of multitrait-multimethod data: Different models for different types of methods. *Psychological Methods*, *13*(3), 230–253.
<https://doi.org/10.1037/a0013219>
- Elleman, L. G., McDougald, S. K., Condon, D. M., & Revelle, W. (2021). That Takes the BISCUIT. *European Journal of Psychological Assessment*.

- Erkic, M., Bailer, J., Fenske, S. C., Schmidt, S. N. L., Trojan, J., Schröder, A., Kirsch, P., & Mier, D. (2018). Impaired emotion processing and a reduction in trust in patients with somatic symptom disorder. *Clin Psychol Psychother*, *25*(1), 163-172. <https://doi.org/10.1002/cpp.2151>
- Espiridion, E. D., & Kerbel, S. A. (2020). A systematic literature review of the association between somatic symptom disorder and antisocial personality disorder. *Cureus*, *12*(7), e9318. <https://doi.org/10.7759/cureus.9318>
- Fleck, L., Fuchs, A., Moehler, E., Parzer, P., Koenig, J., Resch, F., & Kaess, M. (2021). Maternal bonding impairment predicts personality disorder features in adolescence: The moderating role of child temperament and sex. *Personality Disorders: Theory, Research, and Treatment*. <https://doi.org/10.1037/per0000433>
- Gamache, D., Savard, C., Leclerc, P., & Côté, A. (2019). Introducing a short self-report for the assessment of DSM–5 level of personality functioning for personality disorders: The Self and Interpersonal Functioning Scale. *Personality Disorders: Theory, Research, and Treatment*, *10*(5), 438. <https://doi.org/10.1037/per0000335>
- Gamache, D., Savard, C., Leclerc, P., Payant, M., Berthelot, N., Côté, A., ... & Tremblay, M. (2021). A proposed classification of ICD-11 severity degrees of personality pathology using the Self and Interpersonal Functioning Scale. *Frontiers in psychiatry*, *12*. <https://doi.org/10.3389/fpsy.2021.628057>
- Garcia, D. J., Skadberg, R. M., Schmidt, M., Bierma, S., Shorter, R. L., & Waugh, M. H. (2018). It's not that Difficult: An Interrater Reliability Study of the DSM–5 Section III Alternative Model for Personality Disorders. *Journal of Personality Assessment*, *100*(6), 612–620. <https://doi.org/10.1080/00223891.2018.1428982>
- Garcia, D. J., Waugh, M. H., Skadberg, R. M., Crittenden, E. B., Finn, M. T. M., Schmidt, M. R., & Kurdziel-Adams, G. (2021). Deconstructing criterion a of the alternative model for personality disorders. *Personality Disorders: Theory, Research, and Treatment*, *12*(4), 320–330. <https://doi.org/10.1037/per0000431>
- Gluschkoff, K., Jokela, M., & Rosenström, T. (2021). General psychopathology factor and borderline personality disorder: Evidence for substantial overlap from two nationally representative surveys of U.S. adults. *Personality Disorders: Theory, Research, and Treatment*, *12*(1), 86–92. <https://doi.org/10.1037/per0000405>

- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. *Journal of personality and social psychology*, 85(2), 348. <https://doi.org/10.1037/0022-3514.85.2.348>
- Haehner, P., Sleep, C. E., Miller, J. D., Lynam, D. R., & Hopwood, C. J. (2023). The Longitudinal (Co)Development of Personality Traits and the Level of Personality Functioning After Negative Life Events. <https://doi.org/doi.org/10.1177/21677026231197607>
- Hark, S. (1999). Deviante Subjekte: Normalisierung und Subjektformierung. In W. Sohn & H. Mertens (Hrsg.), *Normalität und Abweichung. Studien zur Theorie und Geschichte der Normalisierungsgesellschaft*, 65-84. Opladen: Westdeutscher Verlag.
- Hartmann, J., Bräscher, A. K., Forbush, K. T., Sellbom, M., Watson, D., & Witthöft, M. (2022). The somatoform spectrum within the hierarchical taxonomy of psychopathology system: A taxometric test of the latent structure. *Psychosomatic Medicine*, 84(9), 1067-1076. <https://doi.org/10.1097/PSY.0000000000001105>
- Heathcote, L. C. (2019). Commentary: from symptoms to sensations: Moving toward a normal psychology of somatic experiences in youth. *Journal of Pediatric Psychology*, 44(7), 859-861. <https://doi.org/10.1093/jpepsy/jsz028>
- Heissler, R., Doubková, N., Hutsebaut, J., & Preiss, M. (2021). Semi-structured Interview for Personality Functioning DSM-5 (STiP-5.1): psychometric evaluation of the Czech version. *Personality and Mental Health*, 15(3), 198–207. <https://doi.org/10.1002/pmh.1508>
- Hopwood, C. J. (2018). Interpersonal Dynamics in Personality and Personality Disorders. *European Journal of Personality*, 0(0). <https://doi.org/10.1002/per.2155>
- Hörz-Sagstetter, S., Caligor, E., Preti, E., Stern, B. L., De Panfilis, C., & Clarkin, J. F. (2018). Clinician-Guided Assessment of Personality Using the Structural Interview and the Structured Interview of Personality Organization (STIPO). *Journal of Personality Assessment*, 100(1), 30–42. <https://doi.org/10.1080/00223891.2017.1298115>
- Hörz-Sagstetter, S., Volkert, J., Rentrop, M., Benecke, C., Gremaud-Heitz, D. J., Unterrainer, H.-F., Schauenburg, H., Seidler, D., Buchheim, A., Doering, S., Feil, M. G., Clarkin, J. F., Dammann, G., & Zimmermann, J. (2020). A Bifactor Model of Personality Organization. *Journal of Personality Assessment*, 1–12. <https://doi.org/10.1080/00223891.2019.1705463>

- Hörz-Sagstetter, S., Ohse, L., & Kampe, L. (2021). Three Dimensional Approaches to Personality Disorders: A Review on Personality Functioning, Personality Structure, and Personality Organization. *Current Psychiatry Reports*, 23(7), 45. <https://doi.org/10.1007/s11920-021-01250-y>
- Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1-55. <https://doi.org/10.1080/10705519909540118>
- Huprich, S. K., Auerbach, J. S., Porcerelli, J. H., & Bupp, L. L. (2016). Sidney Blatt's object relations inventory: Contributions and future directions. *Journal of Personality Assessment*, 98, 30–43. <https://doi.org/10.1080/00223891.2015.1099539>
- Hutsebaut, J., Kamphuis, J. H., Feenstra, D. J., Weekers, L. C., & De Saeger, H. (2017). Assessing DSM–5-oriented level of personality functioning: Development and psychometric evaluation of the Semi-Structured Interview for Personality Functioning DSM–5 (STiP-5.1). *Personality Disorders: Theory, Research, and Treatment*, 8(1), 94. <https://doi.org/10.1037/per0000197>
- Hyphantis, T., Goulia, P., & Carvalho, A. F. (2013). Personality traits, defense mechanisms and hostility features associated with somatic symptom severity in both health and disease. *J Psychosom Res*, 75(4), 362-369. <https://doi.org/10.1016/j.jpsychores.2013.08.014>
- Jeung, H., & Herpertz, S. C. (2014). Impairments of interpersonal functioning: empathy and intimacy in borderline personality disorder. *Psychopathology*, 47(4), 220-234. <https://doi.org/10.1159/000357191>
- Kampe, L., Zimmermann, J., Bender, D., Caligor, E., Borowski, A. L., Ehrenthal, J. C., ... & Hörz-Sagstetter, S. (2018). Comparison of the structured DSM–5 clinical interview for the Level of Personality Functioning Scale with the Structured Interview of Personality Organization. *Journal of Personality Assessment*, 100(6), 642-649. <https://doi.org/10.1080/00223891.2018.1489257>
- Kampe, L., & Hörz-Sagstetter, S. (2022). Fähigkeit zur Selbstbeschreibung als Dimension des Persönlichkeitsfunktionsniveaus: Drei diagnostische Fallanalysen. *Psychotherapeut*, 67(2), 122–128. <https://doi.org/10.1007/s00278-022-00575-0>

- Karukivi, M., Vahlberg, T., Horjamo, K., Nevalainen, M., & Korkeila, J. (2017). Clinical importance of personality difficulties: diagnostically sub-threshold personality disorders. *BMC psychiatry*, *17*, 1-9. <https://doi.org/10.1186/s12888-017-1200-y>
- Kerber, A., Gewehr, E., Zimmermann, J., Sachser, C., M. Fegert, J., Knaevelsrud, C., & Spitzer, C. (2023). Adverse childhood experiences and personality functioning interact substantially in predicting depression, anxiety, and somatization. *Personality and Mental Health*. <https://doi.org/10.1002/pmh.1578>
- Kerber, A., Ehrental, J., Zimmermann, J., Remmers, C., Nolte, T., Wendt, L., ... & Knaevelsrud, C. (2024). Examining the role of personality functioning in a hierarchical taxonomy of psychopathology using two years of ambulatory assessed data. <https://doi.org/10.21203/rs.3.rs-3854842/v1>
- Kernberg, O. F. (2004). Borderline Personality Disorder and Borderline Personality Organization: Psychopathology and Psychotherapy. In *Handbook of Personality Disorders: Theory and Practice*, 92–119. John Wiley & Sons Inc.
- Kernberg, O. F., & Caligor, E. (2005). A Psychoanalytic Theory of Personality Disorders. In *Major theories of personality disorder, 2nd ed.* (S. 114–156). The Guilford Press.
- Kernberg, O. F. (2016). What is personality?. *Journal of personality disorders*, *30*(2), 145-156. <https://doi.org/10.1521/pedi.2106.30.2.145>
- Klein, M. (1959). Our adult world and its roots in infancy. *Human relations*, *12*(4), 291–303.
- Komasi, S., Hemmati, A., Rahmani, K., & Rezaei, F. (2023). Construct and criterion validity of the HiTOP spectra to predict dimensional and categorical somatization in a large non-western sample. *Scientific Reports*, *13*(1), 13197. <https://doi.org/10.1038/s41598-023-40545-3>
- Kotov, R., Krueger, R. F., Watson, D., Achenbach, T. M., Althoff, R. R., Bagby, R. M., Brown, T. A., Carpenter, W. T., Caspi, A., Clark, L. A., Eaton, N. R., Forbes, M. K., Forbush, K. T., Goldberg, D., Hasin, D., Hyman, S. E., Ivanova, M. Y., Lynam, D. R., Markon, K., Miller, J. D., Moffitt, T. E., Morey, L. C., Mullins-Sweatt, S. N., Ormel, J., Patrick, C. J., Regier, D. A., Rescorla, L., Ruggero, C. J., Samuel, D. B., Sellbom, M., Simms, L. J., Skodol, A. E., Slade, T., South, S. C., Tackett, J. L., Waldman, I. D., Waszczuk, M. A., Widiger, T. A., Wright, A. G. C., & Zimmerman, M. (2017). The Hierarchical Taxonomy of Psychopathology (HiTOP): A dimensional

- alternative to traditional nosologies. *Journal of abnormal psychology*, 126(4), 454-477. <https://doi.org/10.1037/abn0000258>
- Krueger, R. F., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. *Psychological Medicine*, 42(9), 1879-1890. <https://doi.org/10.1017/S0033291711002674>
- Krueger, R. F. (2019). Criterion B of the DSM-5 alternative model of personality disorders and the interpersonal, multivariate, and empirical paradigms of personality assessment. In C. J. Hopwood, A. L. Muly, & M. H. Waugh (Eds.), *The DSM-5 alternative model of personality disorders: Integrating multiple paradigms of personality assessment* (pp. 60-76). New York: Routledge.
- Leclerc, P., Savard, C., Vachon, D. D., Faucher, J., Payant, M., Lampron, M., ... & Gamache, D. (2021). Analysis of the interaction between personality dysfunction and traits in the statistical prediction of physical aggression: Results from outpatient and community samples. *Personality and mental health*, 16(1), 5-18. <https://doi.org/10.1002/pmh.1522>
- Lenzenweger, M. F., Clarkin, J. F., Kernberg, O. F., & Foelsch, P. A. (2001). The Inventory of Personality Organization: Psychometric properties, factorial composition, and criterion relations with affect, aggressive dyscontrol, psychosis proneness, and self-domains in a nonclinical sample. *Psychological Assessment*, 13(4), 577-591. <https://doi.org/10.1037/1040-3590.13.4.577>
- Levy, K. N., Scala, J. W., Temes, C. M., & Clouthier, T. L. (2015). An integrative attachment theory framework of personality disorders. In S. K. Huprich (Hrsg.), *Personality disorders: Toward theoretical and empirical integration in diagnosis and assessment*. (S. 315-343). American Psychological Association. <https://doi.org/10.1037/14549-014>
- Livesley, W. J., & Jang, K. L. (2005). Differentiating normal, abnormal, and disordered personality. *European Journal of Personality*, 19(4), 257-268. <https://doi.org/10.1002/per.559>
- Lorenzini, N., & Fonagy, P. (2013). Attachment and personality disorders: A short review. *Focus*, 11(2), 155-166. <https://doi.org/10.1176/appi.focus.11.2.155>

- Luyten, P., & Fonagy, P. (2020). Psychodynamic psychotherapy for patients with functional somatic disorders and the road to recovery. *American journal of psychotherapy*, 73(4), 125-130. <https://doi.org/10.1176/appi.psychotherapy.20200010>
- Luyten, P., & Fonagy, P. (2022). Integrating and differentiating personality and psychopathology: A psychodynamic perspective. *Journal of Personality*, 90(1), 75–88. <https://doi.org/10.1111/jopy.12656>
- Luyten, P., Campbell, C., Moser, M., & Fonagy, P. (2024). The role of mentalizing in psychological interventions in adults: Systematic review and recommendations for future research. *Clinical Psychology Review*, 102380. <https://doi.org/10.1016/j.cpr.2024.102380>
- Macina, C., Bendel, R., Walter, M., & Wrege, J. S. (2021). Somatization and Somatic Symptom Disorder and its overlap with dimensionally measured personality pathology: A systematic review. *Journal of Psychosomatic Research*, 151, 110646. <https://doi.org/10.1016/j.jpsychores.2021.110646>
- McCabe, G. A., & Widiger, T. A. (2020). A comprehensive comparison of the ICD-11 and DSM-5 section III personality disorder models. *Psychological Assessment*, 32(1), 72. <https://doi.org/10.1037/pas0000772>
- Mikulincer, M., & Shaver, P. R. (2012). An attachment perspective on psychopathology. *World Psychiatry*, 11(1), 11–15. <https://doi.org/10.1016/j.wpsyc.2012.01.003>
- Morey, L. C., Benson, K. T., Busch, A. J., & Skodol, A. E. (2015). Personality disorders in DSM-5: Emerging research on the alternative model. *Curr Psychiatry Rep*, 17(4), 24. <https://doi.org/10.1007/s11920-015-0558-0>
- Morey, L. C. (2017). Development and initial evaluation of a self-report form of the DSM-5 Level of Personality Functioning Scale. *Psychological assessment*, 29(10), 1302. <https://doi.org/10.1037/pas0000450>
- Noyes, R., Jr., Langbehn, D. R., Happel, R. L., Stout, L. R., Muller, B. A., & Longley, S. L. (2001). Personality dysfunction among somatizing patients. *Psychosomatics*, 42(4), 320-329. <https://doi.org/10.1176/appi.psy.42.4.320>
- Nysaeter, T. E., Hummelen, B., Christensen, T. B., Eikenaes, I. U.-M., Selvik, S. G., Pedersen, G., Bender, D. S., Skodol, A. E., & Paap, M. C. S. (2023). The Incremental Utility of Criteria A and B of the DSM-5 Alternative Model for Personality Disorders for Predicting DSM-IV/DSM-5 Section II Personality Disorders. *Journal of*

- Personality Assessment, 105(1), 111–120.
<https://doi.org/10.1080/00223891.2022.2039166>
- Ohse, L., Zimmermann, J., Kerber, A., Kampe, L., Mohr, J., Kendlbacher, J., ... & Hörz-Sagstetter, S. (2022). Reliability, structure, and validity of module I (personality functioning) of the Structured Clinical Interview for the alternative DSM–5 model for personality disorders (SCID-5-AMPD-I). *Personality Disorders: Theory, Research, and Treatment*, 14(3), 287–299. <https://doi.org/10.1037/per0000576>
- Ohse, L., Zimmermann, J., Kerber, A., Kampe, L., Mohr, J., Schierz, R., Rentrop, M., Dziobek, I., & Hörz-Sagstetter, S. (2023). Impairments in Cognitive and Emotional Empathy as Markers of General versus Specific Personality Pathology. *Psychopathology*, 1–13. <https://doi.org/10.1159/000533861>
- Oltmanns, J. R., Widiger, T. A. (2016): Self-pathology, the five-factor model, and bloated specific factors: A cautionary tale. *J Abnorm Psychol*, 125, 423-434.
<https://doi.org/10.1037/abn0000144>
- Oltmanns, J. R., & Oltmanns, T. F. (2019). Self–other agreement on ratings of personality disorder symptoms and traits: Three meta-analyses. <https://psyarxiv.com/mka3j/>
- OPD Task Force. (2008). *Operationalized Psychodynamic Diagnosis OPD-2: Manual of Diagnosis and Treatment Planning*. Hogrefe & Huber.
- OPD Task Force. (2023). *OPD-3 - Operationalisierte Psychodynamische Diagnostik. Das Manual für Diagnostik und Therapieplanung [OPD-3—Operationalized psychodynamic diagnosis: Manual of diagnosis and treatment planning]*. Hogrefe.
- Paris, J. (2007). Why psychiatrists are reluctant to diagnose: borderline personality disorder. *Psychiatry (Edgmont)*, 4(1), 35.
- Pedrosa Gil, F., Ridout, N., Kessler, H., Neuffer, M., Schoechlin, C., Traue, H. C., & Nickel, M. (2009). Facial emotion recognition and alexithymia in adults with somatoform disorders. *Depress Anxiety*, 26(1), E26-E33.
<https://doi.org/https://doi.org/10.1002/da.20456>
- Pincus, A. L., Hopwood, C. J., & Wright, A. G. C. (2017). The Interpersonal Situation: An Integrative Framework for the Study of Personality, Psychopathology, and Psychotherapy. In J. F. Rauthmann, R. Sherman, & D. C. Funder (Hrsg.), *The Oxford Handbook of Psychological Situations*. Oxford University Press.
<https://doi.org/10.1093/oxfordhb/9780190263348.013.4>

- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903.
<https://doi.org/10.1037/0021-9010.88.5.879>
- Preti, E., Di Pierro, R., Costantini, G., Benzi, I. M. A., De Panfilis, C., & Madeddu, F. (2018). Using the Structured Interview of Personality Organization for DSM–5 Level of Personality Functioning Rating Performed by Inexperienced Raters. *Journal of Personality Assessment, 100*(6), 621–629.
<https://doi.org/10.1080/00223891.2018.1448985>
- R Core Team. (2021). *R: a language and environment for statistical computing*. R Foundation for Statistical Computing. <https://www.R-project.org/>
- Reise, S. P., Scheines, R., Widaman, K. F., & Haviland, M. G. (2013). Multidimensionality and structural coefficient bias in structural equation modeling: A bifactor perspective. *Educational and Psychological Measurement, 73*(1), 5-26.
<https://doi.org/10.1177/0013164412449831>
- Rezaei, F., Hemmati, A., Rahmani, K., & Komasi, S. (2020). A systematic review of personality temperament models related to somatoform disorder with main focus on meta-analysis of Cloninger's theory components. *Indian J Psychiatry, 62*(5), 462-469.
https://doi.org/10.4103/psychiatry.IndianJPsychiatry_345_20
- Rezaei, F., Rahmani, K., Hemmati, A., & Komasi, S. (2023). A head-to-head comparison of eight unique personality systems in predicting somatization phenomenon. *BMC Psychiatry, 23*(1), 912. <https://doi.org/10.1186/s12888-023-05424-1>
- Sandoval, A. A., & Ayala, R. L. (2024). Somatoform disorders and personality traits in hospitalized patients with chronic back pain in El Salvador. *Alerta, 7*(1), 69-78. <https://doi.org/10.5377/alerta.v7i1.17484>
- Samuel, D. B., Sanislow, C. A., Hopwood, C. J., Shea, M. T., Skodol, A. E., Morey, L. C., ... & Grilo, C. M. (2013). Convergent and incremental predictive validity of clinician, self-report, and structured interview diagnoses for personality disorders over 5 years. *Journal of consulting and clinical psychology, 81*(4), 650.
<https://doi.org/10.1037/a0032813>
- Satorra, A., & Bentler, P. M. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika, 66*(4), 507-514. <https://doi.org/10.100/BF02296192>

- Sharp, C., Wright, A. G. C., Fowler, J. C., Frueh, B. C., Allen, J. G., Oldham, J., & Clark, L. A. (2015). The structure of personality pathology: Both general ('g') and specific ('s') factors? *Journal of Abnormal Psychology*, *124*(2), 387–398.
<https://doi.org/10.1037/abn0000033>
- Sharp, C., & Wall, K. (2021). DSM-5 level of personality functioning: Refocusing personality disorder on what it means to be human. *Annual review of clinical psychology*, *17*, 313-337. <https://doi.org/10.1146/annurev-clinpsy-081219-105402>
- Sheehan, L., Nieweglowski, K., & Corrigan, P. (2016). The stigma of personality disorders. *Current Psychiatry Reports*, *18*, 1-7. <https://doi.org/10.1007/s11920-015-0654-1>
- Shi, D., Maydeu-Olivares, A., & DiStefano, C. (2018). The Relationship Between the Standardized Root Mean Square Residual and Model Misspecification in Factor Analysis Models. *Multivariate Behavioral Research*, *53*(5), 676–694.
<https://doi.org/10.1080/00273171.2018.1476221>
- Siefert, C., & Porcerelli, J. H. (2015). Object relations theory and personality disorders: Internal representations and defense mechanisms. In *Personality disorders: Toward theoretical and empirical integration in diagnosis and assessment*. (S. 203–224). American Psychological Association. <https://doi.org/10.1037/14549-009>
- Simonsen, S., Eikenaes, I. U. M., Bach, B., Kvarstein, E., Gondan, M., Møller, S. B., & Wilberg, T. (2020). Level of alexithymia as a measure of personality dysfunction in avoidant personality disorder. *Nordic Journal of Psychiatry*, *75*(4), 266-274. J.
<https://doi.org/10.1080/08039488.2020.1841290>
- Skodol, A. E., First, M. B., Bender, D. S., & Oldham, J. M. (2018). Module II: structured clinical interview for personality traits. In M. B. First, A. E. Skodol, D. S. Bender, & J. M. Oldham (Eds.), *Structured clinical interview for the DSM-5 alternative model for personality disorders (SCID-AMPD)*. American Psychiatric Association Publishing.
- Sleep, C. E., Weiss, B., Lynam, D. R., & Miller, J. D. (2020). The DSM–5 section III personality disorder criterion a in relation to both pathological and general personality traits. *Personality Disorders: Theory, Research, and Treatment*, *11*(3), 202.
<https://doi.org/10.1037/per0000383>

- Somma, A., Borroni, S., Gialdi, G., Carlotta, D., Emanuela Giarolli, L., Barranca, M., ... & Fossati, A. (2020). The inter-rater reliability and validity of the Italian translation of the structured clinical interview for DSM-5 alternative model for personality disorders module i and module ii: A preliminary report on consecutively admitted psychotherapy outpatients. *Journal of personality disorders, 34*(Supplement C), 95-123. https://doi.org/10.1521/pedi_2020_34_511
- Spitzer, C., Müller, S., Kerber, A., Hutsebaut, J., Brähler, E., & Zimmermann, J. (2021). Die deutsche Version der Level of Personality Functioning Scale-Brief Form 2.0 (LPFS-BF): Faktorenstruktur, konvergente Validität und Normwerte in der Allgemeinbevölkerung. *PPmP-Psychotherapie· Psychosomatik· Medizinische Psychologie*. <https://doi.org/10.1055/a-1343-2396>
- Stone, M. H. (2012). Disorder in the domain of the personality disorders. *Psychodynamic Psychiatry, 40*(1), 23-45. <https://doi.org/10.1521/pdps.2012.40.1.23>
- Su, R., Tay, L., & Diener, E. (2014). The development and validation of Comprehensive Inventory of Thriving (CIT) and Brief Inventory of Thriving (BIT). *Applied Psychology: Health and Well-being*. <https://doi.org/10.1111/aphw.12027>
- Triebwasser, J., & Shea, M. T. (1996). Personality change resulting from another mental disorder. In T. A. Widiger, A. J. Frances, H. A. Pincus, R. Ross, M. B. First, & W. W. Davis (Eds.), *DSM-IV sourcebook* (Vol. 2, pp. 861–868). Washington, DC: American Psychiatric Association.
- Tyrer, P., Mulder, R., Kim, Y. R., & Crawford, M. J. (2019). The development of the ICD-11 classification of personality disorders: An amalgam of science, pragmatism, and politics. *Annual review of clinical psychology, 15*, 481-502. <https://doi.org/10.1146/annurev-clinpsy-050718-095736>
- Tyrer, P., & Mulder, R. (2022). In *Personality Disorder: From Evidence to Understanding* (1. Aufl.). Cambridge University Press. <https://doi.org/10.1017/9781108951685>
- Van Dijk, S. D., Hanssen, D., Naarding, P., Lucassen, P., Comijs, H., & Oude Voshaar, R. (2016). Big Five personality traits and medically unexplained symptoms in later life. *Eur Psychiatry, 38*, 23-30. <https://doi.org/10.1016/j.eurpsy.2016.05.002>
- Verheul, R., Bartak, A., & Widiger, T. (2007). Prevalence and construct validity of personality disorder not otherwise specified (PDNOS). *Journal of personality disorders, 21*(4), 359-370. <https://doi.org/10.1521/pedi.2007.21.4.359>

- Volkert, J., Gablonski, T. C., & Rabung, S. (2018). Prevalence of personality disorders in the general adult population in Western countries: systematic review and meta-analysis. *The British Journal of Psychiatry*, *213*(6), 709-715.
<https://doi.org/10.1192/bjp.2018.202>
- Watts, A. L., Poore, H. E., & Waldman, I. D. (2019). Riskier tests of the validity of the bifactor model of psychopathology. *Clinical Psychological Science*, *7*(6), 1285-1303.
<https://doi.org/10.1177/2167702619855035>
- Waugh, M. H., McClain, C. M., Mariotti, E. C., Mulay, A. L., DeVore, E. N., Lenger, K. A., ... & Beevers, L. G. (2021). Comparative content analysis of self-report scales for level of personality functioning. *Journal of personality assessment*, *103*(2), 161- 173.
<https://doi.org/10.1080/00223891.2019.1705464>
- Weekers, L. C., Hutsebaut, J., & Kamphuis, J. H. (2019). The Level of Personality Functioning Scale-Brief Form 2.0: Update of a brief instrument for assessing level of personality functioning. *Personality and Mental Health*, *13*(1), 3–14.
<https://doi.org/10.1002/pmh.1434>
- West, S. G., Finch, J. F., & Curran, P. J. (1995). Structural equation models with nonnormal variables: problems and remedies. In R. H. Hoyle (Ed.), *Structural Equation Modeling: Concepts, Issues, and Applications* (pp. 56–75). Sage Publications, Inc.
- Westen, D., Lohr, N., Silk, K. R., Gold, L., & Kerber, K. (1990). Object Relations and Social Cognition in Borderlines, Major Depressives, and Normals: A Thematic Apperception Test Analysis. *Psychological Assessment*. <https://doi.org/10.1037/1040-3590.2.4.355>
- Widiger, T. A., & Samuel, D. B. (2005). Evidence-based assessment of personality disorders. *Psychological Assessment*, *17*(3), 278-287. <https://doi.org/10.1037/1040-3590.17.3.278>
- Widiger, T. A., & Trull, T. J. (2007). Plate tectonics in the classification of personality disorder: shifting to a dimensional model. *Am Psychol*, *62*(2), 71-83.
<https://doi.org/10.1037/0003-066x.62.2.71>
- Widiger, T. A., & McCabe, G. A. (2020). The alternative model of personality disorders (AMPD) from the perspective of the five-factor model. *Psychopathology*, *53*(3-4), 149-156. <https://doi.org/10.1159/000507378>

- Winsper, C., Bilgin, A., Thompson, A., Marwaha, S., Chanen, A. M., Singh, S. P., ... & Furtado, V. (2020). The prevalence of personality disorders in the community: a global systematic review and meta-analysis. *The British Journal of psychiatry*, 216(2), 69-78. <https://doi.org/10.1001/archpsyc.58.6.590>
- Woodling, C., Wygant, D. B., Umlauf, R. L., & Marek, R. J. (2022). Somatoform's placement and validity in the hierarchical taxonomy of psychopathology (HiTOP). *Psychiatry Research*, 313, 114593. <https://doi.org/10.1016/j.psychres.2022.114593>
- Woods, C.M. Careless Responding to Reverse-Worded Items: Implications for Confirmatory Factor Analysis. *J Psychopathol Behav Assess*, 28, 186–191 (2006). <https://doi.org/10.1007/s10862-005-9004-7>
- World Health Organization. (1992). *International classification of diseases and related health problems, Tenth Revision (ICD-10)*.
- World Health Organization. (2022). *International classification of diseases and related health problems, Eleventh Revision (ICD-11)*. <https://icd.who.int/en>
- Ximénez, C., Maydeu-Olivares, A., Shi, D., & Revuelta, J. (2022). Assessing Cutoff Values of SEM Fit Indices: Advantages of the Unbiased SRMR Index and Its Cutoff Criterion Based on Communality. *Structural Equation Modeling: A Multidisciplinary Journal*, 29(3), 368–380. <https://doi.org/10.1080/10705511.2021.1992596>
- Zetl, M., Taubner, S., Hutsebaut, J., & Volkert, J. (2019). Psychometrische Evaluation der deutschen Version des Semistrukturierten Interviews zur Erfassung der DSM-5 Persönlichkeitsfunktionen (STiP-5.1). *PPmP-Psychotherapie· Psychosomatik· Medizinische Psychologie*, 69(12), 499-504. <https://doi.org/10.1055/a-1010-6887> <https://doi.org/10.1001/archpsyc.1990.01810180027005>
- Zimmermann, J., Ehrenthal, J. C., Cierpka, M., Schauenburg, H., Doering, S., & Benecke, C. (2012). Assessing the level of structural integration using operationalized psychodynamic diagnosis (OPD): Implications for DSM–5. *Journal of personality assessment*, 94(5), 522-532. <https://doi.org/10.1080/00223891.1012.700664>
- Zimmermann, J., Benecke, C., Hörz, S., Rentrop, M., Peham, D., Bock, A., ... & Dammann, G. (2013). Validierung einer deutschsprachigen 16-item-Version des Inventars der

- Persönlichkeitsorganisation (IPO-16). *Diagnostica*. <https://doi.org/10.1026/0012-1924/a000076>
- Zimmermann, J., Altenstein, D., Krieger, T., Holtforth, M. G., Pretsch, J., Alexopoulos, J., Spitzer, C., Benecke, C., Krueger, R. F., & Markon, K. E. (2014). The structure and correlates of self-reported DSM-5 maladaptive personality traits: findings from two German-speaking samples. *Journal of Personality Disorders*, 28(4), 518-540. https://doi.org/10.1521/pedi_2014_28_130
- Zimmermann, J., Böhnke, J. R., Eschstruth, R., Mathews, A., Wenzel, K., & Leising, D. (2015). The latent structure of personality functioning: Investigating criterion A from the alternative model for personality disorders in DSM-5. *Journal of Abnormal Psychology*, 124(3), 532–548. <https://doi.org/10.1037/abn0000059>
- Zimmermann, J., Kerber, A., Rek, K., Hopwood, C. J., & Krueger, R. F. (2019). A brief but comprehensive review of research on the Alternative DSM-5 Model for Personality Disorders. *Current Psychiatry Reports*, 21(9), 92. <https://doi.org/10.1007/s11920-019-1079-z>
- Zimmermann, J., Müller, S., Bach, B., Hutsebaut, J., Hummelen, B., & Fischer, F. (2020). A common metric for self-reported severity of personality disorder. *Psychopathology*, 53(3-4), 168–178. <https://doi.org/10.1159/000507377>
- Zimmermann, J., Falk, C. F., Wendt, L., Spitzer, C., Fischer, F., Bach, B., ... & Müller, S. (2023a). Validating the German version of the Personality Disorder Severity-ICD-11 Scale using nominal response models. *Psychological Assessment*, 35(3), 257. <https://doi.org/10.1037/pas0001199>
- Zimmermann, J., & Hopwood, C. J., & Krueger, R. F. (2023b). The DSM-5 level of personality functioning scale. In R. F. Krueger & P. H. Blaney (Eds.), *Oxford Textbook of Psychopathology* (4th ed.). Oxford University Press.
- Zou, G. Y. (2007). Toward using confidence intervals to compare correlations. *Psychological methods*, 12(4), 399-413. <https://doi.org/10.1037/1082-989X.12.4.399>

Appendix A

Study I

Macina, C., Bendel, R., Walter, M., Wrege, J.S. (2021). Somatization and Somatic Symptom Disorder and its overlap with dimensionally measured personality pathology: A systematic review. *Journal of Psychosomatic Research, 151*, 110646. <https://doi.org/10.1016/j.jpsychores.2021.110646>



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Review article

Somatization and Somatic Symptom Disorder and its overlap with dimensionally measured personality pathology: A systematic review

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ABSTRACT

Objective: Difficulties in the assessments of Somatoform Disorders (SD) and Personality Disorders (PD) regarding operationalization, arbitrary thresholds, and reliability led to a shift from categorical to dimensional models in the DSM-5. Empirical research data postulates a continuous level of severity in both groups of diseases. The aim of this systematic review was to investigate the overlap between somatization and personality pathology.

Methods: Until July 2020, we conducted a systematic literature search with PubMed, Web of Science and SCOPUS. We specifically reviewed current empirical data on the Alternative Model of Personality Disorders (AMPD) and Somatic Symptom Disorder (SSD) and SD. Data was drawn out using predefined data panels. Results were reflected in the context of the Hierarchical Taxonomy of Psychopathology (HiTOP) model. Risk of bias was assessed due to blinding, randomization, selective reporting, incomplete data, and attribution bias.

Results: A total of eight studies ($N = 2979$) met the inclusion criteria. Whereas categorical measures revealed mixed results, positive correlations between SD/SSD and dimensionally measured personality functioning were present in four studies ($N = 1741$). In three studies ($N = 2025$) correlations between SD/SSD and neuroticism/negative affectivity ($d = 0.22$ – 1.041) were present. Moreover, harm avoidant ($d = 0.526$ – 0.826) and self-defeating traits ($d = 0.892$) revealed significant associations with somatization.

Conclusions: Dimensional personality assessments are highly neglected in patients with SSD and warrant further research. However, in line with the HiTOP model, there is tentative evidence that somatization can be described as an independent personality trait, which shows most striking overlaps with self-pathologies (Criterion A) and the trait of negative affectivity (Criterion B).

1. Introduction

There is consensus on the high prevalence of somatization in primary care with 20–30% of primary care patients with somatization meeting the criteria for a somatoform disorder (SD) [1]. Regarding health care costs, patients with somatization in contrast to patients without somatization are high utilizer of the primary care system, and show, in the USA alone, estimated incremental medical care costs of about \$256 billion a year [2].

Especially patients suffering from multiple somatization symptoms have highly increased coexistence or comorbidity with other mental

disorders, especially anxiety, depressive and personality disorders (PDs) [3]. However, neither a diagnosis of anxiety disorder nor depression sufficiently covers a somatization syndrome, where a “physical experience of emotional distress” [4] in [5] is more pronounced [3,6]. Regarding patients with PD and somatization, both show an early onset of illness and a chronic illness course, but the question if somatization disorder should be better included under PDs is still uncertain [7,8]. Therefore, improvements in co-morbid diagnosing and early identification of somatization symptoms are crucial to reduce health care costs [2].

Acronyms: AMPD, alternative model of personality disorders; APA, american psychiatric association; BDD, bodily distress disorder; CCG, clinical control group; DSM, diagnostic and statistical manual of mental disorders; DSQ, defense style questionnaire; ERQ, emotion regulation questionnaire; g-PD, general factor of personality disorder; HC, healthy controls; HiTOP, hierarchical taxonomy of psychopathology; ICD, international classification of diseases; LPF, level of personality functioning; MUS, medically unexplained symptoms; PD, personality disorder; SD, somatoform disorder; SSD, somatic symptom disorder; TAS, Toronto alexithymia scale; TCI, temperament and character inventory; WHO, world health organization.

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1.1. The revised conceptualization of somatization in DSM-5

The latest revision of the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5) [9] addresses these difficulties of comorbid somatization by replacing *somatoform disorders* (DSM-IV) [10] with the section *somatic symptom and related disorders*. Thereby, the previous diagnosis of *somatization disorder and pain disorder* is revised by the new diagnosis *somatic symptom disorder* (SSD). The subcategories from DSM-IV are removed in favor for measures of severity reaching from mild to moderate to severe [9]. Of note, SSD compared to SD no longer requires that the symptoms have to be medically unexplained [11]. This brings a theoretical shift from a focus on the absence of a medical explanation to focusing on the presence of maladaptive reactions (B criterion) to the somatic symptomatology [12]. The new concept of SSD with its inclusion of a new psychological B criterion aims to compensate stigmatization and eliminate the body-mind dualism in respect of a biopsychosocial approach [13]. Although the new, more dimensional diagnosis process seems to be more challenging (e.g., psychosomatic aspects of migraine) [14], giving a subject the diagnosis of a mental disorder only because of the lack of a physiological origin seems inappropriate [9]. With this theoretical shift the SSD group is now more heterogeneous. Therefore, the prevalence of SSD is expected to be higher (presumably around 5–7%) according to the DSM-5 compared to the prevalence of the DSM-IV somatization disorder (<1%) [9].

1.2. The overlap between PDs and somatization, and its dimensional nature

The discussion of correlations between PDs and somatization is not an all-new issue [e.g.,15–18]. Nevertheless, personality assessments in patients with somatization seem to be highly neglected, even though the high associations are known since decades. In 1995, Bass and Murphy [7] examined the association between SD and PDs and concluded that two in three patients with a SD also fulfill the criteria for a PD, whereas Naylor et al. [8] even assumes the existence of a *pain personality*. Despite

this high comorbidity, only 4.2% of SD patients also depict a clinical diagnosis for PD [19]. Therefore, there is a huge discrepancy between the theoretical SD and PD comorbidity and the prevalence of this comorbidity in practice. This phenomenon is most probably built on a lack of adequately applying multidimensional diagnostic systems [20–22].

Although clinically derived, categorical assessments of personality in the DSM-5 [9] and in the International Classification of diseases, 10th edition (ICD-10) [23] have several shortcomings, among those highly stigmatizing the patients. Considering the heaped overlaps among diagnostic categories [e.g.,24–36], low reliability [37], limited convergent validity, arbitrary diagnostic thresholds and temporal instability of the diagnoses [38,39], this indicates that the dimensional nature of PDs is not adequately implemented. Thus, essential evidence has convened to favor the dimensional over the categorical conceptualization of PDs [37,39,40], which led to the Alternative Model of Personality Disorders in the DSM-5 section III (AMPD) [9]. This hybrid model addresses the clinical needs for categorical diagnoses as well as dimensional evidence-based data by assessing two Criteria for personality. In the AMPD, PDs are rated by assessing the *Level of Personality Functioning Scale* LPFS (Criterion A), including a self-domain (*identity and self-direction*) and an interpersonal domain (*empathy and intimacy*), and the *personality traits* (Criterion B) including *negative affectivity, detachment, antagonism, disinhibition and psychoticism* [9]. Compared to the Hierarchical Taxonomy of Psychopathology (HiTOP) [20], which assumes that nearly all mental-health problems can be arranged in six common spectra, and thus reduces heterogeneity, the AMPD is a model only focusing on personality pathology. In contrast, the HiTOP (see Fig. 1.) aggregates existing evidence on psychopathology on five hierarchical levels of complexity ranging from *signs and symptoms* to *symptom components* to *syndromes/ disorders* to *subfactors* to *spectra* and at the highest level to a *superspectrum* so called general factor of PD (g-PD). Moreover, somatoform is one of these spectra within HiTOP, but is not captured as an independent trait domain in neither the AMPD of the DSM-5 [9] nor the proposed ICD-11.

In summary, the new B criterion of SSD brings a focus of

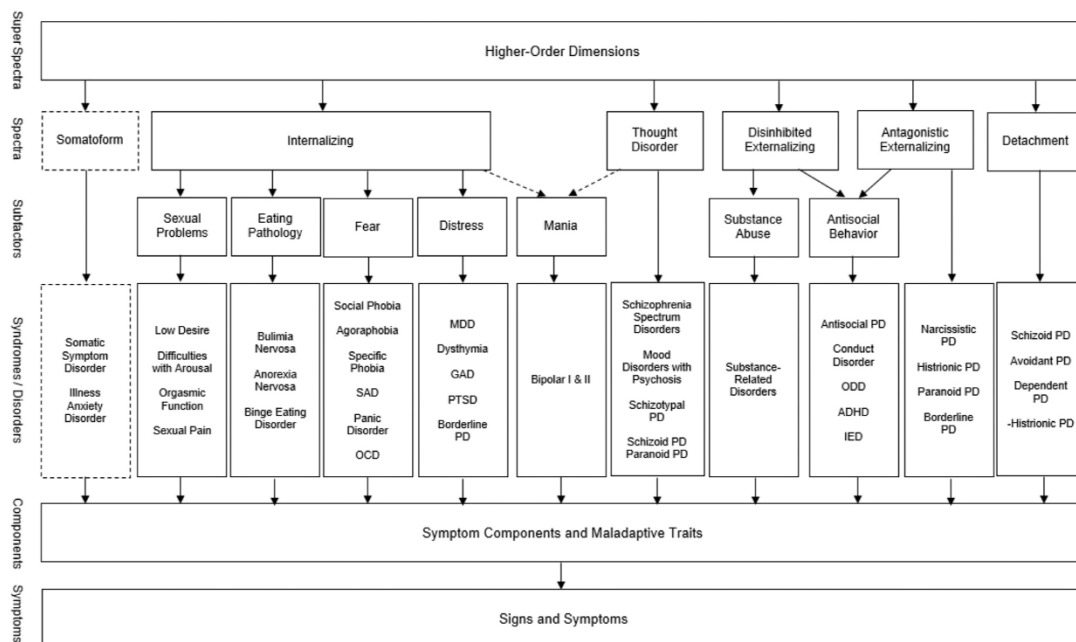


Fig. 1. Hierarchical Taxonomy of Psychopathology (HiTOP). Note: Adapted from “The Hierarchical Taxonomy of Psychopathology (HiTOP): A dimensional alternative to traditional nosologies”, by R. Kotov et al., 2017, *Journal of Abnormal Psychology*, 126(4), 462. (<https://doi.org/10.1037/abn000258>). Copyright (2017) by the American Psychiatric Association.

psychological maladaptive processes, which can also be linked to psychological maladaptive processes in PDs. With the knowledge of several overlaps between personality pathologies and somatization, as well as the dimensional nature of these overlaps, a multi-dimensional approach also covering somatization is necessary [20–22].

1.3. Objectives

The objectives of this article were (1) to systematically investigate available evidence regarding personality assessments in patients suffering from SD/SSD. Regarding the reconceptualization of SSD in the DSM-5, we sought (2) to review available evidence for overlaps of these concepts with the AMPD. Furthermore, results (3) were crucially reflected in the context of new dimensional models of psychopathology (HiTOP and AMPD). Thus, we want to emphasize the importance of personality pathology in SSD patients.

2. Methods

2.1. Eligibility criteria

Eligibility criteria for included studies were: (1) adult patients (18–79), (2) published in English, (3) clinical study population with DSM-IV/ ICD-10 diagnosis of somatization or SD or DSM-5 diagnosis of SSD and at least one clinical control group (CCG) or a healthy control group (HC), (4) at least one personality assessment instrument, (5) exclude hypochondriasis as in ICD-11. This distinguished DSM-5 from ICD-11 bodily distress disorder (BDD), where hypochondriasis will be moved to obsessive-compulsive and related disorder.

2.2. Information sources and search

Studies were identified by electronic database search on Scopus, PubMed, and Web of Science (Core Collection). The final search was carried out on 10 July 2020; at 2:50 p.m., Search terms contained a triple combination of words including Somatization, SD and SSD; personality, personality traits, pathological personality categories and dimensional personality terms; as well as dimensional diagnostic systems.

2.3. Study selection

Eligibility assessment followed a stepwise structure by screening all titles, then remaining abstracts and finally full-text. Two reviewers, who searched independently and mutually blind from each other, by a standardized procedure, screened all the studies. Final cross-referencing included studies resulted from database search, which were full-text screened; and theoretical studies without a clinical population were cross-referenced.

2.4. Data collection process

Data extraction contained an independent group formation of given studies by considering eligibility inclusion criteria. Disagreement between the two reviewers were discussed between them; if no agreement could be reached, a third author adjudicated.

2.5. Data items

Characteristics of the studies include: (1) information on study participants (including group composition, mean sex, mean age), (2) diagnostic instrument used, (3) control group (including either a HC or a CCG), (4) study design (including study aims, dependent and independent variables, main outcomes).

2.6. Risk of bias in individual studies

Risk of bias was assessed unblinded at study-level from two independent (C.M. and R.B. under supervision from J.W.) authors. The assessment of risk of bias was due to blinding, random sequence generation, selective reporting, incomplete data, attribution, and other bias. Data of the different studies was drawn out by predefined data panels.

2.7. Synthesis of result and risk of bias across studies

Due to heterogeneous results and quite small numbers of identified and included studies, the decision was against quantitative meta-analyses and quantitative assessment of risk of bias. Conduction focused on qualitative synthesis of study results, *id est*. associations between personality pathology (categorical PDs and dimensional level of personality functioning and pathological personality trait expression) and SD or SSD. With these overlaps, we sought associations to dimensional models of psychopathology. The risk of bias across the included publications was qualitatively assessed and is estimated rather low.

3. Results

3.1. Study selection

In total eight studies were included in the review. The whole search on Scopus, Web of Science and PubMed consisted of 6042 citations. After removing duplicates 5946 publications were left, whereas 5417 of them were excluded after screening the title and a further 512 after screening the abstract. The remaining 17 records were full-text analyzed with regards to the inclusion criteria. At this step, 12 publications were excluded. Further cross-referencing of the 17 remaining records at level of full-text screening and cross-references of 12 theoretical publications, whereby three publications were additionally included. Cross-referencing was important because the focus in the search terms was on DSM-5/ICD-11 and dimensional personality diagnostics in SD/SSD, which only resulted in five articles. This led to an inclusion of eight studies in the systematic review, which met the inclusion criteria (see flow diagram, Fig. 2). Studies of somatic symptoms (e.g., migraine, fibromyalgia etc.) were not included, if they did not apply an additional measure for psychosomatic aspects or symptoms.

3.2. Study characteristics

The eight included studies [41–48] comprise in total a population of $N = 2979$ patients. None of the included studies included the AMPD. Details on the study characteristics depict Table 1, a summary of the study characteristics can be found in Table 3 (see appendix).

Subject to the research aim, the studies differed in respect to whether the dependent or the independent variable was either PD or SDD. In two studies [45,46] the dependent variables consisted exclusively of somatization variables and the independent variables of personality scales. In three other studies [41–43] the dependent and independent variables had the opposite direction, *i.e.*, personality traits were the dependent and somatization the independent variable. The remaining three studies [44,47,48] show mixed personality and somatization scales relating to dependent and independent variables.

3.3. Risk of bias within and across studies

Across all the studies the most important bias, which were present in all eight studies, was due to no random sequence generation, incomplete data reporting, attribution and no blinding of participants. Blinding of care providers was included in two of the eight studies [43,45]. Study protocols of the included studies were not published or registered and therefore we could not estimate the risk of bias for selective reporting due to missing data or the risk for publication biases due to publication

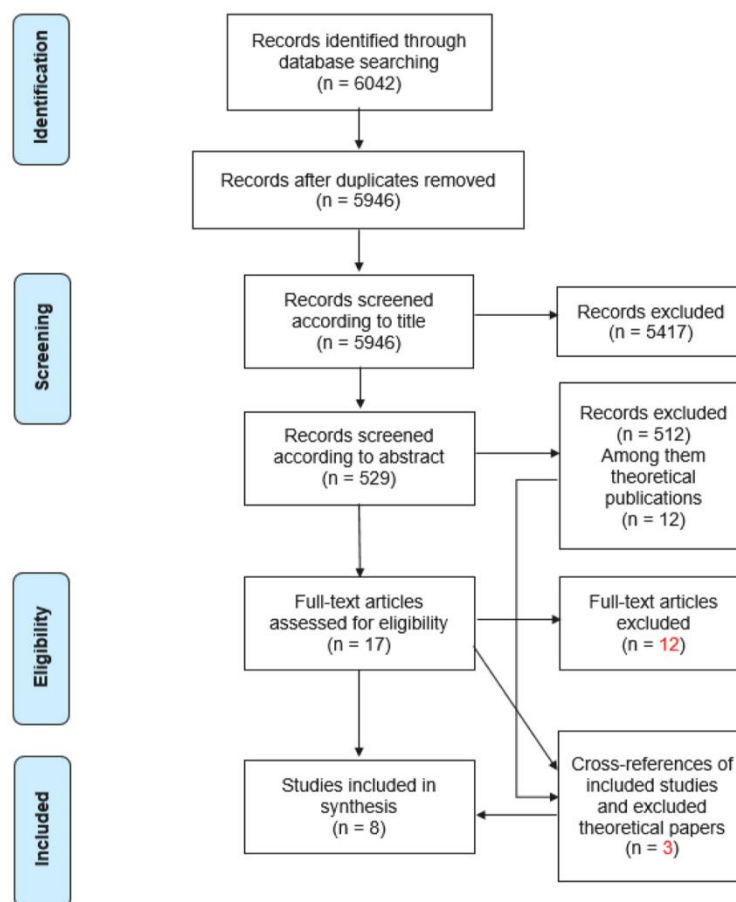


Fig. 2. Flow of information through the different phases of the systematic review.

preferences.

3.4. Results of individual studies and synthesis of results

The individual results of the eight remaining studies are depicted in Table 2. The results of this systematic review were reported from the perspective of the AMPD (objective 2). Results are heterogeneous and none of the included studies applied dimensional personality diagnostics as introduced in the AMPD of DSM-5. However, in the context of somatization several alternative dimensional measures of personality including parts of the level of personality functioning (Criterion A) or trait-based description (Criterion B) were applied.

Regarding *personality functioning*, four studies ($N = 1741$) [41,43,44,46] used measures for key functions of personality on domain level: The Temperament and Character Inventory (TCI) [49], the Greek version of Defense Style Questionnaire (DSQ) [50], the Emotion Regulation Questionnaire (ERQ) [51] and the Toronto Alexithymia Scale (TAS-20) [52]. The results of these four questionnaires reveal first, that chronic pain patients compared to a CCG show significant character impairments in self-directedness ($d = -0.673, p < 0.001$) and cooperativeness ($d = -0.527, p < 0.001$) [43]. Second, self-sacrificing ($d = 0.451, p < 0.001$), self-criticizing defense mechanisms ($d = 0.292, p < 0.001$) show significant associations with somatization in comparison to HC [46]. Third, SSD patients compared to HC show difficulties in the personality facets of emotion processing, more precisely in the identification ($\eta_p^2 = 0.381, p < 0.001$) and description of own feelings ($\eta_p^2 = 0.315, p < 0.001$), which fourth, in turn is related to high alexithymia

(TAS-20) scores [44]. However, alexithymia and pain disorders might be independent constructs as, contrary to what was expected, pain patients in the study by Aragona et al. [41] revealed no group differences regarding alexithymia compared to somatic pain and no pain patients ($p = 0.964$).

Regarding the potential association of somatization and *personality traits*, first, three studies ($N = 2025$) showed significant correlations of somatization and neuroticism ($d = 0.22, p < 0.001$) [46] ($d = 0.813, p < 0.0001$) [47] ($d = 1.041, p < 0.003$) [48]. Second, in addition to neuroticism, self-defeating ($d = 0.892, p < 0.0001$), negativistic ($d = 0.694, p = 0.0005$) and depressive ($d = 0.699, p = 0.0003$) personality traits also seem to be significantly higher in SD patients compared to a CCG [47]. Third, within the Big Five domain, agreeableness ($d = -0.372, p = 0.03$) has been found to be lower in young SD patients compared to a CCG [47], whereas higher agreeableness scores have been found in elderly patients with somatization ($d = 0.018, p < 0.040$) compared to HC [48]. Fourth, regarding temperament, introverted and anxious features/facets, such as harm avoidance ($d = 0.826, p < 0.0001$), fatigability ($d = 1.146, p < 0.001$), which is a facet of harm avoidance [42]; ($d = 0.526, p < 0.001$) [43], low novelty seeking ($d = -0.366, p = 0.002$), low reward dependence ($d = -0.517, p < 0.001$) [42], high sensitivity for anger ($d = 0.40$) and less investment in trust games ($d = 0.73$) [44] show significant associations with somatization compared to CCG [43] or HCs [42,44].

Regarding possible overlaps between somatization and categorical diagnoses of PD, 41–63% of SD/SSD patients have at least one comorbid PD [43,45,47]. In consideration of the different types of PD, mixed

Table 1
Characteristics of study population and content identified by systematic search.

	Author	Year	Journal	Study aim	Population (N)	Mean Age	Sex (% female)	Diagnostic instruments	PD SSD
Studies with a healthy control group	Erkic et al.	2018	Clinical psychology & psychotherapy	Investigating emotion processing in SSD and how these might interact	35 SSD patients 35 HC	SSD: 42.4 HC: 41.1	SSD: 57.1% HC: 57.1%	SCID- II (DSM-IV) (ERQ)	SCID-I (DSM-IV) DSM-5 SSD (clinical) PDI PHQ-15 SOMS-7 T TAS-20 PHQ-15 HAQ SCID-I (DSM-IV)
	Huang et al.	2016	Journal of Affective Disorders	Comparing indicators of personality features and psychopathology in SD patients and HC	148 SD patients 146 HC	SD: 52.2 HC: 39.8	SD: 66.9% HC: 65.8%	TPQ	PHQ-15 HAQ SCID-I (DSM-IV)
	Hyphantis et al.	2013	Journal of Psychosomatic Research	Comparing potential associations of personality traits, hostility features, defense mechanisms with somatic symptom severity	810 chronic medical patients 411 HC	Patients: 53.1 HC: 34.4	Patients: 62.2% HC: 66.7%	ZKPQ (HDHQ/DSQ/LSI)	SCL-90-R somatization subscale
	Van Dijk et al.	2016	European Psychiatry	Comparing personality profiles of older patients suffering from MUS with two comparison groups (MES, DD) and HC	96 patients with MUS 153 attenders with MES 255 DD patients 125 HC	MUS: 70.1 MES: 73.4 DD: 70.5 HC: 70.1	MUS: 66.7% MES: 43.1% DD: 64.3% HC: 61.6%	NEO-FFI	BSI-53 MINI (DSM-IV-TR) VAS (WI)
Studies with clinical control group (s)	Aragona et al.	2008	Pain Research and Management	Investigating the role of hysterical features in patients diagnosed as having a DSM-IV-TR pain disorder associated with psychological factors	48 pain disorder patients 48 SP patients 42 somatic controls, no pain	PDP: 51.8 SP: 49.3 NP: 50.1	PD: 68.8% SP: 70.8% NP: 54.8%	Diagnostic Interview (not specified) MMPI	Diagnostic Interview (DSM-IV-TR) tPRI TAS-20
	Conrad et al.	2007	Pain	1) Comparing personality profiles of chronic pain patients with pain-free controls 2) Investigating whether the TCI can validly identify the presence or absence of a PD	207 CPP 105 pain-free CCG	CPP: 45.8 Pain-free CCG: 47.1	CPP: 44.4% female Pain-free CCG: 42.9%	TCI SCID-II (DSM-IV)	BPI MINI Plus (DSM-IV)
	Garcia-Campayo et al.	2007	Journal of psychosomatic research	Assessing PD comorbidity in Somatization patients compared with psychiatric controls	70 Somatization disorder patients 70 mood and/or anxiety disorder patients (CCG)	Somatization Disorder patients: 47.6 CCG: 48.7	Somatization Disorder patients: 88.5% CCG: 88.5%	IPDE (DSM-IV)	SPPI (DSM-IV)
	Noyes et al.	2001	Psychosomatics	Assessing the nature and extent of personality dysfunctioning related to somatization	141 Patients with Somatization 34 Patients without Somatization	Patients with Somatization 42.2 Patients without Somatization 45.5	Patients with Somatization: 78% Patients without Somatization: 79.4%	SIDP (DSM-IV) NEO-FFI	PRIME-MD SCID-I (DSM-IV, only somatoform) IWS

BPI = Brief Pain Inventory, BSI-53 = Brief Symptom Inventory, CCG = Clinical Control Group, CPP = Chronic Pain Patients, DD = Depressive Disorder, DSM-IV-TR = Diagnostic and Statistical Manual of Mental Disorders fourth edition text revised, DSM-5 SSD = Somatic Symptom Disorder diagnosis according to DSM-5, DSQ = Defense Style Questionnaire, ERQ = Emotion Regulation Questionnaire, HAQ = Health Anxiety Questionnaire, HC = Healthy Controls, HDHQ = Hostility and Direction of Hostility Questionnaire, IPDE = International Personality Disorder Examination, IWS = Illness Worry Scale, LSI = Plutchik's Life Style Index, MES = Medically Explained Symptoms, MINI = Mini-International Neuropsychiatric Interview, MINI Plus = Mini-International Neuropsychiatric Interview-Plus, MMPI = Minnesota Multiphasic Personality Inventory, MUS = Medically Unexplained Symptoms, NEO-FFI = NEO-Five-Factor Inventory, NP = No Pain, PD = Personality Disorder, PDP = Pain disorder patients, PDI = Pain Disability Index, PHQ-15 = Patient Health Questionnaire, PRIME-MD = Primary Care Evaluation of Mental Disorders, SCID-I = Structured Clinical Interview for Axis I Disorders, SCID-II = Structured Clinical Interview for Axis II Disorders, SCL-90-R = Symptom Distress Checklist, SD = Somatoform Disorder, SIDP = Structured Interview for DSM-IV Personality, SOMS-7 T = Screening for Somatoform Disorders, SP = Somatic Pain, SPPI = Standardized Polyvalent Psychiatric Interview, SSD = Somatic Symptom Disorder, TAS-20 = Toronto Alexithymia Scale, TCI = Temperament and Character Inventory, TPQ = Tridimensional Personality Questionnaire, tPRI = total Pain Rating Index, VAS = Visual Analogue Scale, WI = Whitley Index, ZKPQ = Zuckerman-Kuhlman Personality Questionnaire.

results are found. However, the most consistent correlations were reported for an association between SD/SSD and paranoid ($p < 0.001$) [43], ($d = 1.224$, $OR = 9.2$; 95% CI = 1.9–43.) [45] and obsessive-compulsive PD ($d = 1.006$, $OR = 6.2$, 95% CI = 1.2–53.6) [45], ($d = 0.663$, $\chi^2 = 8.30$, $p = 0.004$) [47], but also reveal significant correlations

between borderline ($p = 0.001$), avoidant ($p = 0.009$), additional passive-aggressive ($p = 0.003$) [43] and histrionic PD ($d = 0.706$, $OR = 3.6$; 95% CI = 0.9–13.9) [45] and SD/SSD.

Table 2
Design characteristics and results of studies identified by systematic search.

	Author	Year	Independent variables	Dependent variables	Main results
Studies with a healthy control group	Erkic et al.	2018	1) SSD 2) association between emotion regulation and SSD 3) emotion recognition performance	1) different dimensions of emotion processing 2) alexithymia 3) alexithymia and emotion regulation deficits	- SSD patients > HC: difficulties in identification and description of own feelings ($\eta^2 = 0.381$, $F [1,68] = 41.93$, $p < 0.001$ and $\eta^2 = 0.315$, $F [1,68] = 31.28$, $p < 0.001$) - SSD patients: less cognitive reappraisal ($\eta^2 = 0.185$, $F [1,68] = 15.47$, $p < 0.001$), but more expressive suppression ($\eta^2 = 0.047$, $F [1,68] = 3.36$, $p = 0.071$) - SSD > HC: superior emotion recognition, especially sensitive for anger ($d = 0.40$) - SSD: less investigation in trust game ($d = 0.73$)
	Huang et al.	2016	1) SD and HC 2) somatic complaints, hypochondriacal ideation, depression, anxiety	1) different personality features 2) personality	- SD patients compared to HC: lower novelty seeking ($d = -0.366$, $p = 0.002$), reward dependence ($d = -0.517$, $p < 0.001$), higher harm avoidance ($d = 0.826$, $p < 0.001$) - Most powerful predictor of SD development: fatigability ($d = 1.146$, $p < 0.001$), which is a facet of harm avoidance - In both samples: higher neuroticism ($d = 0.22$, $p < 0.001$), adoption of the displacement defense ($d = 0.078$, $p < 0.001$) and depressive symptoms ($d = 0.497$, $p < 0.001$) correlate positively and independently with somatic symptom severity - Introverted features (i.e., self-sacrificing defensive style, $d = 0.451$, $p < 0.001$; self-criticizing defense style, $d = 0.292$, $p < 0.001$) were associated with higher somatic symptom severity in chronic medical patients
	Hyphantis et al.	2013	5 ZKPQ scales, 4 DSQ defense styles, 8 LSI defenses, 5 HDHQ components	SCL-90 somatization subscales in HC and patients with long-term medical conditions	- The four groups differed on neuroticism ($F = 135.5$, $df = 3.623$, $p < 0.001$) and extraversion ($F = 65.2$, $df = 3.623$, $p < 0.001$), not on openness ($F = 5.2$, $df = 3.616$, $p = 0.161$), agreeableness ($F = 2.7$, $df = 3.620$, $p = 0.045$) and conscientiousness ($F = 36.7$, $df = 3.622$, $p = 0.193$) - MUS > HC higher neuroticism ($d = 1.041$, $p < 0.003$) and agreeableness ($d = 0.018$, $p < 0.040$); MUS > DD lower neuroticism ($d = -0.931$, $p < 0.002$) and higher extraversion ($d = 0.713$, $p < 0.003$) and agreeableness ($d = 0.253$, $p < 0.009$) - MUS and MES had a similar personality profile (all P -values between 0.035 and 0.799). - Health anxiety and somatization were associated with a higher level of neuroticism (WI: $\beta = 0.48$, $p < 0.001$ and BSI-23: $\beta = 0.36$, $p < 0.001$), a lower level of extraversion (WI: $\beta = -0.04$, $p = 0.010$ and BSI-23: $\beta = -0.02$, $p = 0.014$) and conscientiousness (WI: $\beta = -0.24$, $p < 0.001$ and BSI-23: $\beta = -0.23$, $p < 0.001$), irrespective of the explanation of physical symptoms
	Van Dijk et al.	2016	1) 4 groups: MUS; MES; DD; HC 2) MUS and MES 3) MUS and MES personality dimensions	1) Big Five Personality domains 2) Big Five Personality domains 3) WI and BSI-53	- Pain disorder > somatic pain & no pain group: higher MMPI Hy ($F = 4.613$, $p = 0.012$), Hs ($F = 6.710$, $p = 0.002$) and Hy-Ad ($F = 8.702$, $p = 0.0001$) - All groups: similar MMPI K ($F = 0.096$, $p = 0.909$) and Hy-Dn ($F = 0.312$, $p = 0.732$) and TAS-20 ($F = 0.037$, $p = 0.964$) scores - Pain disorder group: negative correlation between Hy-Ad and Hy-Dn ($r = -0.489$, $p = 0.001$, two-tailed) - 60% of CCP and 0% of CCG fulfill criteria for somatoform disorder ($p < 0.001$); 41% of CPP and 7% of CCG fulfill criteria for any PD ($p < 0.001$) - Most frequent PDs: 12% of CPP and 0% of CCG fulfill SCID-II criteria for paranoid PD ($p < 0.001$); 11% of CPP and 0% of CCG for BPD ($p = 0.001$); 8% of CPP and 1% of CCG for avoidant PD ($p = 0.009$); 8% of CPP and 0% of CCG fulfill criteria for additional passive-aggressive PD ($p = 0.003$) - Most significant difference (ANCOVA) in Temperament: Harm Avoidance ($d = 0.526$, $p < 0.001$) between CPP and CCG - Most significant difference (ANCOVA) in Character: Self-Directedness ($d = -0.673$, $p < 0.001$) between CPP and CCG; and Cooperativeness ($d = -0.527$, $p < 0.001$) between CPP and CCG. In CPPs: the symptom of all PD subtypes significantly related to low Self-Directedness and, to a lesser degree, low Cooperativeness. - In CPP: 75.8% of absence or presence of PD were correctly identified by TCI Self-Directedness and Cooperativeness character dimensions - Overall: Multiple hierarchical regression analyses (controlling for age, gender, depression and state anxiety): TCI scales predicted on average 23% in PD symptom counts. - 62.9% PD comorbidity in Somatization disorder patients and 28.2% PD comorbidity in HC ($d = 0.721$, $OR = 3.7$; 95% CI = 1.8–7.6). - The highest ORs of PD in Somatization disorder patients,
Studies with clinical control group(s)	Aragona et al.	2008	3 groups: pain disorder; somatic pain; no pain	MMPI Hy and its 2 subscales: Ad and Dn	
	Conrad et al.	2007	1) 2 groups: CPP and HC	1) TCI and 12 PDs	
	Garcia-Campayo et al.	2007	1) PD comorbidity 2) PD comorbidity	1) Somatization disorder 2) HC	

(continued on next page)

Table 2 (continued)

Author	Year	Independent variables	Dependent variables	Main results
Noyes et al.	2001	1) Patients with Somatization and Patients without Somatization 2) SIDP and NEO mean scores	1) SIDP and NEO-FFI 2) Somatization subtypes	<p>compared with controls in paranoid ($d = 1.224$, $OR = 9.2$; 95% $CI = 1.9-43.0$), obsessive-compulsive ($d = 1.006$, $OR = 6.2$; 95% $CI = 1.2-53.6$), and histrionic ($d = 0.706$, $OR = 3.6$; 95% $CI = 0.9-13.9$) PDs.</p> <p>- Patients with Somatization fulfill the criteria for a DSM-IV personality disorder more often than CCG (51% > 29%; $\chi^2 = 5.12$; $p = 0.02$), especially for obsessive-compulsive personality disorder ($d = 0.663$, $\chi^2 = 8.30$, $p = 0.002$).</p> <p>- Self-defeating ($d = 0.892$, $p < 0.0001$), depressive ($d = 0.699$, $p = 0.0003$), and negativistic ($d = 0.684$, $p = 0.0005$) personality traits were higher in patients with Somatization than in CCG.</p> <p>- Patients with Somatization show higher scores on neuroticism ($d = 0.813$, $p < 0.0001$) and lower scores on agreeableness ($d = -0.372$, $p = 0.03$) than CCG.</p> <p>- Patients with Facultative and initial somatization scored higher on personality pathology than patients with true somatization ($p = 0.002$).</p>

Ad = Admission of symptoms, BPD = Borderline Personality Disorder, BSI-53 = Brief Symptom Inventory, CCG = Clinical Control Group, CPP = Chronic Pain Patients, DD = Depressive Disorder, Dn = Denial of symptoms, DSQ = Defense Style Questionnaire, HC = Healthy Controls, HDHQ = Hostility and Direction of Hostility Questionnaire, Hs = Hypochondriasis, LSI = Plutchik's Life Style Index, MES = Medically Explained Symptoms, MMPI Hy = Minnesota Multiphasic Personality Inventory Hysteria scale, MMPI K = Minnesota Multiphasic Personality Inventory Correction scale, MUS = Medically Unexplained Symptoms, NEO-FFI = NEO-Five-Factor Inventory, OR: odds ratio, PD = Personality Disorder, SCL-90-R = Symptom Distress Checklist, SD = Somatoform Disorder, SIDP = Structured Interview for DSM-IV Personality, SSD = Somatic Symptom Disorder, TAS-20 = 20-Item Toronto Alexithymia Scale, TCI = Temperament and Character Inventory, WI = Whitley Index, ZKPQ = Zuckerman-Kuhlman Personality Questionnaire.

4. Discussion

4.1. Summary of evidence

We systematically reviewed the literature regarding associations in the assessment of personality and somatization (SD/SSD). Overall, the evidence is very limited, with eight studies meeting our inclusion criteria and their quality being low. Until July 2020, to the best of our knowledge, there is yet no study that fully applied the AMPD model in order to identify dimensional overlaps between personality pathologies and somatization symptoms.

Regarding the LPF, across all eight included studies, there is tentative evidence that difficulties in self-domain measured with the TCI, DSQ, ERQ and TAS-20 highly correlate with the presence of SD/SSD. Similarly, associations between personality traits and somatization were found for neuroticism, agreeableness as well as introverted features like harm avoidant, low novelty seeking, self-defeating, negativistic and depressive traits.

Due to the heterogeneity and limitations in applying categorical personality diagnostics our results show that categorical approaches bring little clarity for the question of potential overlaps of personality pathology and SD/SSD. However, 41–63% of SD/SSD patients revealed at least one comorbid PD. Nevertheless, this underscores the importance of dimensional diagnostic approaches.

4.2. Strengths and limitations

4.2.1. Strengths and limitations at study level

Strengths at the level of the studies were: First, all studies used assessments for both, personality and somatization. Six studies used standardized or semi-standardized interviews and one did not specify the interview. One article only used self-report measurements.

However, we could not determine the different domains of LPF as well as the traits in SSD patients, as none of the included studies used the AMPD of DSM-5. Notably, the included studies disclose certain limitations, as first a missing randomization, as well as second a missing study protocol. Third, participants were not blind to their condition. Fourth, some results show attribution bias due to comorbidity with other psychiatric diagnosis, as mood or anxiety disorders. For detailed information, see Table 3 in the Appendix.

4.2.2. Strengths and limitations at systematic review level

Strengths at systematic review level include: First a relatively high number of participants, second a rather specific, but sensitive search term strategy and third strict inclusion criteria. However, as a first limitation, a high number of excluded studies bears the probable risk that relevant evidence for the research question under scrutiny has been excluded due to rigorous inclusion criteria, (e.g., control group, and disorder specific assessments). Second, due to heterogeneous results and study designs the implementation disqualified for a meta-analysis. Third, we only inspected studies published in English.

4.3. Personality dysfunctions and pathological traits in SSD patients

Until today, pinpointing personality dysfunctions and pathological traits in SD/SSD patients is difficult, as available studies did not make use of sufficiently operationalized models. However, available data of significant associations between somatization and personality pathologies can be re-interpreted using the AMPD model as a theoretical scaffold. As e.g., there is conceptual overlap in the area of self-direction in AMPD with self-directedness as defined in the TCI. Patients with somatization compared to patients without somatization more often show a comorbid PD, and reveal lower self-directedness and cooperativeness [43]. Low self-directedness as defined in the TCI refers to problems in defining and setting oneself meaningful goals accompanied with difficulties in adaptive coping and motivation. This corresponds with the self-domain within Criterion A in AMPD. Moreover, using (low) self-directedness and (low) cooperativeness in patients with somatization as a predictor for a categorical PD according to DSM-IV this correlates with all twelve PD-subtypes and was accurate in 75.8% [43]. Interpreting this data tentatively the other way around, this might indicate that approximately seven in ten patients with somatization can be identified by self-directedness and cooperativeness. Whereas self-directedness refers to the self-domain, low cooperativeness refers to interpersonal dysfunctions of empathy and intimacy in AMPD. Sleep et al. [53], a study not included in our systematic review due to strict inclusion criteria, supports this interpretation. By calculating bivariate correlations between SD and PD pathologies, Sleep et al. [53] showed large effect sizes for the self-domain (identity and self-direction) and medium effect sizes for the interpersonal domain (empathy and intimacy) of the AMPD. Of note, high somatic symptom severity in SD/SSD

Table 3
Summary of study characteristics identified by systematic search.

	Study characteristics	Study(ies)
Age	1 study had patients aged below 45 years	2004; Erkcic et al., 2018
	1 study had patients aged above 70 years	van Dijk et al., 2016
	6 studies had patients aged between 45 and 54 years	Aragona et al., 2008; Conrad et al., 2007; Garcia-Campayo et al., 2007; Hyphantis et al., 2013; Noyes et al., 2001; Huang et al., 2016
Sex	1 study had a majority of male patients	Conrad et al., 2007
	7 studies had a majority of female patients	Aragona et al., 2008; Huang et al., 2016; Erkcic et al., 2018; Garcia-Campayo et al., 2007; Hyphantis et al., 2013; Noyes et al., 2001; van Dijk et al., 2016
Comparison groups	4 studies compared patients with somatization with healthy controls	Erkcic et al., 2018; Hyphantis et al., 2013; van Dijk et al., 2016; Huang et al., 2016
	4 studies compared patients suffering from somatization with other psychiatric patients	Aragona et al., 2008; Conrad et al., 2007; Garcia-Campayo et al., 2007; Noyes et al., 2001
Diagnostic assessment (form)	4 studies used standardized or semi-structured interviews for both disorders (PD and SSD) (most used: Structured Clinical Interview for Axis I, Axis II Disorders, and the Mini-International Neuropsychiatric Interview)	Conrad et al., 2007; Erkcic et al., 2018; Garcia-Campayo et al., 2007; Noyes et al., 2001
	1 study used diagnostic interviews (not further specified)	Aragona et al., 2008
	2 studies used an interview for SSD (but not personality)	van Dijk et al., 2016; Huang et al., 2016
Diagnostic assessment (classification)	1 study used questionnaires for both disorders	Hyphantis et al., 2013
	No study used the AMPD	Hyphantis et al., 2013
	4 studies used categorical interviews for personality pathology (SCID-II, IPDE and SIDP)	2004; Conrad et al., 2007; Erkcic et al., 2018; Garcia-Campayo et al., 2007; Noyes et al., 2001
	7 studies used self-questionnaires for dimensional personality diagnostic	Aragona et al., 2008; Conrad et al., 2007; Erkcic et al., 2018; Hyphantis et al., 2013; Noyes et al., 2001; van Dijk et al., 2016; Huang et al., 2016
	3 studies used categorical and dimensional personality diagnostic	Erkcic et al., 2018; Conrad et al., 2007; Noyes et al., 2001
	1 study used categorical personality diagnostic only	Garcia-Campayo et al., 2007
	3 studies used dimensional personality diagnostic only	Hyphantis et al., 2013; van Dijk et al., 2016; Huang et al., 2016
1 study used a dimensional questionnaire (no information regarding type of classification)	Aragona et al., 2008	

patients also correlates with high expressions of self-sacrificing and self-criticizing defense mechanisms [46]. These self-pathologies could be best matched in the self-esteem facet of the identity subdomain within the AMPD model.

Furthermore, Erkcic et al. [44] and Pedrosa et al. [54] found emotion

processing to be restricted in SD/SSD patients. In specific, we allocate this restricted emotion processing to the AMPD identity's facet of tolerating and regulating emotions.

Difficulties in identifying and describing one's own feelings and those of others [44,54] are directly associated to high alexithymia scores [44]. As a consequence, SD/SSD patients with compared to HC significantly higher alexithymia scores also reveal poor social functioning that, other than the problems in identifying emotions, also has been related to low cooperativeness and self-reflection [55]. Re-interpreting the alexithymia construct in the light of the AMPD model, related personality dysfunctions in SD/SSD patients appear to be distributed across all four subdomains. In detail, alexithymia's weak emotion processing aspect matches with facets of the identity subdomain, alexithymic low self-reflection matches with the self-direction subdomain, impaired mentalization with the empathy subdomain, and low relationship depth in alexithymia with the intimacy subdomain. The alexithymia concept serves to explain a link between pathological somatic sensation and disturbed emotion processing in SD/SSD patients who depict a somatosensory distortion [56]. Even though alexithymia seems to cover facets of personality dysfunctions in all four subdomains, disturbed emotion processing primarily relates to dysfunctions in identity and self-direction. Increases in bodily sensations and illness feelings may in turn lead to more negative emotions and less trust, hence finally impair social interactions and lead to interpersonal dysfunction in empathy and intimacy, which influences the self-domain again and so on [44].

Moreover, a recent study [57] could demonstrate a vicious circle between alexithymia and emotional neglect and physical abuse, which is a known predictor for PDs [58]. In contrast, one included study of our review [41] did not show group differences regarding alexithymia between patients with somatization and patients without somatization, which may be a result of the strict exclusion criteria (i.e. no comorbid anxiety or depression) of the patients' sample used therein.

The mentioned vicious circle of emotion processing deficits could explain why co-occurring somatization in psychotherapeutic treatments of any theoretical background leads to difficulties in the therapeutic relationship, irrespective of whether there is a diagnosis for PD. For this reason and the associated low trait levels of agreeableness [47], the doctor-patient relationship is of conflictual nature and thus a limiting factor of therapeutic outcome [59], which may be associated to high suicidality in SD patients [60].

Apart from personality dysfunctions, our review also found data on pathological trait expressions in SD/SSD patients. SD/SSD patients depict high level of neuroticism [46–48]. Neuroticism matches with the negative affectivity domain of Criterion B in the AMPD model. This is supported by Sleep et al.'s [53] finding of patients with somatization showing large effect sizes on negative affectivity that is highly correlated to the Big Fives' neuroticism. Interestingly, in the DSM-5 SSD section it is stated that the personality trait of negative affectivity is an independent risk factor for SSD [9,61–63]. Negative affectivity is interrelated with personality dysfunctions in the self-domain, which is manifest in high effect convergent trait load on identity as well as self-direction [53]. This suggests that patients with somatization show impaired self-functioning and salient negative affectivity scores, and that a firm delineation between Criterion A and B seems unrealistic [64].

High expressed harm avoidance is also prevalent in the temperament of patients with somatization [42,43]. This trait refers to a tendency of being anxious, sensitive to criticism, pessimistic and in need of more reassurance [8]. Of note, harm avoidance and self-directedness, strongly load on the neuroticism/negative affectivity trait [21,53,65]. In this regard, tentative evidence points to a relationship between harm avoidance, self-directedness, neuroticism and anxiety, which may compose a common personality factor given the high amount of shared variance [66,67].

Concerning further pathological personality traits in patients suffering from somatization, our results reveal different findings regarding agreeableness of the Big Five model. Thereby strikingly,

agreeableness has been found to be lower in young SD patients compared to a CCG [47], whereas higher agreeableness scores have been found in elderly patients with somatization compared to HC [48]. This might be related to the acceptance and expectations of pain as a consequence of aging in older patients with medically unexplained symptoms (MUS). In theory, this might cause less psychological distress in older compared to younger patients, and even positive personality dimensions in elderly patients have been suggested [48]. In fact, elderly MUS patients score higher on agreeableness compared to depressive patients. Regardless whether medically explained or unexplained, both types of SD/SSD patients show similar personality profiles in advanced age [48].

Although the categorical personality approach has many limitations and heterogeneity, previous research discussed the overlap of Cluster B (impulsive) PDs and SD extensively [42,68,69]. With regard to our results of high harm avoidance, low novelty seeking and reward dependence; we see a greater overlap of SD with Cluster C (fearful) PDs. There is tentative evidence that low reward dependence is related to Cluster A (odd-eccentric) PDs, novelty seeking to Cluster B PDs and harm avoidant to Cluster C PDs [43].

4.4. Comparison of AMPD and HiTOP and the difficulty of embedding a separate somatoform spectrum

Dimensional conceptualizations of psychopathology evaluate mental dysfunction on a range of continua. In reviewing the evidence of possible overlaps and associations between SD/SSD and personality pathologies, we aim at facilitating the discussion about whether to include a separate personality trait domain, e.g., somatoform spectrum, in the hierarchical measurements of mental health problems as proposed by the HiTOP model, but not proposed in the AMPD.

Both, the AMPD and the HiTOP seem to have quite similar core elements, but also vary with respect to the number of levels. Whereas the AMPD is more process-focused, the HiTOP model is more description-focused [70]. With respect to the structure of these two models, the AMPD assumes an overlap between Criterion A and B, whereas the HiTOP proposes an increasing specificity from bottom to the top of the model [70]. The HiTOP spectra have similarity with the Criterion B of AMPD, and the HiTOP's g-PD can be interpreted as a more complex factor, however still comparable with its counterpart in AMPD, the Criterion A [21].

The hierarchical concept of the HiTOP places the g-PD factor on top of the model, which would plead for incremental validity of Criterion A over B [71,72]. Nevertheless, the additional benefit and incremental validity of Criterion A has been put into question [21,73]. Although we see incremental validity of LPF in previous research [71,74,75] and in our results on SD/SSD and LPF, many studies continue to focus on trait expression (e.g., 84.8% of publications; [73]). Criterion A is not designed to capture specific PDs, but severity of impairment and may thus be the most important domain to assess [76], potentially informing about the intensity and duration of a psychological treatment [77].

Although trait domains of AMPD do generally align with the HiTOP spectra, there is no identical congruence, e.g., in contrast to HiTOP there is no separate trait dimension for somatization in AMPD [21]. With respect to HiTOP, there is an ongoing discussion if the somatoform spectrum is independent or can be classified under the spectrum of internalizing. Similarly, our results reveal high levels on self-dysfunction, which is loading strongly on the higher-order internalizing spectrum, but also impaired interpersonal functioning (e.g., cooperativeness), which is loading on the externalizing factor of the HiTOP [66]. In contrast to the notion to subordinate somatoform conditions within the internalizing spectrum [78,79], data also support the somatoform spectrum as a separate sixth dimension [22]. Kotov et al. [80] argues in that favor as the correlations between the internalizing and the somatoform spectra are of only modest nature, and McNulty and Overstreet [81] could show evidence for a six-factor solution for

psychopathology. Therefore, personality characteristics of SD/SSD patients seem to be unique, which we also saw with respect to the high risk of suicide in SD patients, which is still present after controlling for comorbid depression and PD [60]. Subsequently, because of rather weak associations of somatoform condition under internalizing, this hypothesis was currently rejected; delimitation therefore, the somatoform spectrum has been provisionally included in the HiTOP and requires a placement in the AMPD trait domain.

5. Implications

We synthesized evidence from a high number of studies by conservatively including studies, which used a CCG or HC and systematically measured SD/SSD problems and personality pathologies. As none of our included studies applied a recent, fully dimensionally operationalized model of personality, we highlight the importance of dimensional diagnostic processes, which include a systematic assessment approach of personality pathologies as proposed by AMPD in SD/SSD patients. By measuring self- and interpersonal impairments [e.g.,82,83] as well as maladaptive personality traits more detailed, therapists can inform patients suffering from SSD about their misinterpretations and misattributions in their personal life, reducing stigmatization in SSD [84]. In turn, we expect that this also will foster better treatment of the patient's misinterpretation-routed physiological sensations. Thus, patients can receive an adequate therapy, which implicates both, diagnostic-guided improvements in personality dysfunctions and SSD symptomatology. We emphasize to consider the more heterogeneous and thus more demanding criteria of SSD of DSM-5 and therefore antagonize the body-mind dualism. This might strengthen the therapeutic relationship, because less mistrust is processes, alluding to the high comorbidity of categorical paranoid PD and somatization. More specifically, patients with SSD may be relieved because medically explainable symptoms are also included in the SSD diagnosis.

6. Conclusions

We systematically reviewed the evidence on personality pathologies in SD/SSD patients, which was overall very limited. Research using categorical personality measures reveal that SSD patients show overlaps with PDs from all clusters. Due to the low specificity of categorical diagnoses, in searching for potential evidence of overlaps between these two groups of patients, dimensional approaches in the HiTOP and AMPD are much more informative, but absent. Matching existing evidence on dimensionally measured personality pathologies in SD/SSD with the AMPD model, we found impairments in the self-domain of the LPF most robust. However, SD/SSD patients also reveal high trait loads in neuroticism/negative affectivity. A compound profile, including LPF impairments and high specific personality trait loads, has been suggested, but is not adequately based on solid research. Informed by a discussion of hybrid and fully dimensional models of personality assessment, we theoretically reflected our systematic review that emphasizes the necessity of dimensional personality models in relation to SSD.

Declaration of Competing Interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jpsychores.2021.110646>.

References

- [1] M. Rosendal, F. Olesen, P. Fink, T. Toft, I. Sokolowski, F. Bro, A randomized controlled trial of brief training in the assessment and treatment of somatization in primary care: effects on patient outcome, *Gen. Hosp. Psychiatry* 29 (4) (2007) 364–373, <https://doi.org/10.1016/j.genhosppsych.2007.03.005>.
- [2] A.J. Barsky, E.J. Orav, D.W. Bates, Somatization increases medical utilization and costs independent of psychiatric and medical comorbidity, *Arch. Gen. Psychiatry* 62 (8) (2005) 903–910, <https://doi.org/10.1001/archpsyc.62.8.903>.
- [3] H.-P. Kapfhammer, Somatoforme Störungen - somatoforme Belastungsstörung und verwandte Störungen, in: H.J. Möller, G. Laux, H.-P. Kapfhammer (Eds.), *Psychiatrie, Psychosomatik, Psychotherapie*, Springer, 2017, pp. 2105–2253.
- [4] Z.J. Lipowski, Somatization: the concept and its clinical application, *Am. J. Psychiatry* 145 (11) (1988) 1358–1368, <https://doi.org/10.1176/ajp.145.11.1358>.
- [5] K.E. Boerner, K. Green, A. Chapman, E. Stanford, T. Newlove, K. Edwards, A. Dhariwal, Making sense of “somatization”: a systematic review of its relationship to pediatric pain, *J. Pediatr. Psychol.* 45 (2) (2020) 156–169, <https://doi.org/10.1093/jpepsy/jsz102>.
- [6] M. McKenzie, D.M. Clarke, D.P. McKenzie, G.C. Smith, Which factors predict the persistence of DSM-IV depression, anxiety, and somatoform disorders in the medically ill three months post hospital discharge? *J. Psychosom. Res.* 68 (1) (2010) 21–28, <https://doi.org/10.1016/j.jpsychores.2009.08.004>.
- [7] C. Bass, M. Murphy, Somatoform and personality disorders: syndromal comorbidity and overlapping developmental pathways, *J. Psychosom. Res.* 39 (4) (1995) 403–427, [https://doi.org/10.1016/0022-3999\(94\)00157-z](https://doi.org/10.1016/0022-3999(94)00157-z).
- [8] B. Naylor, S. Boag, S.M. Gustin, New evidence for a pain personality? A critical review of the last 120 years of pain and personality, *Scand J Pain* 17 (2017) 58–67, <https://doi.org/10.1016/j.sjpain.2017.07.011>.
- [9] American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders*, 5th ed, American Psychiatric Publication, Washington, DC, 2013.
- [10] American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders*, 4 ed, American Psychiatric Association, Washington, DC, 1994.
- [11] C.S. North, B.A. Hong, H.H. Lai, D.H. Alpers, Assessing somatization in urologic chronic pelvic pain syndrome, *BMC Urol.* 19 (1) (2019) 130, <https://doi.org/10.1186/s12894-019-0556-3>.
- [12] A. Herzog, M.C. Shedden-Mora, P. Jordan, B. Löwe, Duration of untreated illness in patients with somatoform disorders, *J. Psychosom. Res.* 107 (2018) 1–6, <https://doi.org/10.1016/j.jpsychores.2018.01.011>.
- [13] W. Rief, A. Martin, How to use the new DSM-5 somatic symptom disorder diagnosis in research and practice: a critical evaluation and a proposal for modifications, *Annu. Rev. Clin. Psychol.* 10 (2014) 339–367, <https://doi.org/10.1146/annurev-clinpsy-032813-153745>.
- [14] G. Abbate-Daga, S. Fassino, R. Lo Giudice, I. Rainero, C. Gramaglia, L. Marech, F. Amianto, S. Gentile, L. Pinessi, Anger, depression and personality dimensions in patients with migraine without aura, *Psychother. Psychosom.* 76 (2) (2007) 122–128, <https://doi.org/10.1159/000097971>.
- [15] S.O. Lilienfeld, The association between antisocial personality and somatization disorders: a review and integration of theoretical models, *Clin. Psychol. Rev.* 12 (6) (1992) 641–662, [https://doi.org/10.1016/0272-7358\(92\)90136-V](https://doi.org/10.1016/0272-7358(92)90136-V).
- [16] J. Stern, M. Murphy, C. Bass, Personality disorders in patients with somatization disorder: a controlled study, *Br. J. Psychiatry* 163 (6) (1993) 785–789, <https://doi.org/10.1192/bjp.163.6.785>.
- [17] K.M. Rost, R.N. Akins, F.W. Brown, G.R. Smith, The comorbidity of DSM-III-R personality disorders in somatization disorder, *Gen. Hosp. Psychiatry* 14 (5) (1992) 322–326, [https://doi.org/10.1016/0163-8343\(92\)90066-J](https://doi.org/10.1016/0163-8343(92)90066-J).
- [18] L.J. Kirmayer, J.M. Robbins, J. Paris, Somatoform disorders: personality and the social matrix of somatic distress, *J. Abnorm. Psychol.* 103 (1) (1994) 125–136, <https://doi.org/10.1037/0021-843x.103.1.125>.
- [19] H. Kuwabara, M. Otsuka, M. Shindo, S. Ono, T. Shioiri, T. Someya, Diagnostic classification and demographic features in 283 patients with somatoform disorder, *Psychiatry Clin. Neurosci.* 61 (3) (2007) 283–289, <https://doi.org/10.1111/j.1440-1819.2007.01664.x>.
- [20] R. Kotov, R.F. Krueger, D. Watson, T.M. Achenbach, R.R. Althoff, R.M. Bagby, T. A. Brown, W.T. Carpenter, A. Caspi, L.A. Clark, N.R. Eaton, M.K. Forbes, K. T. Forbush, D. Goldberg, D. Hasin, S.E. Hyman, M.Y. Ivanova, D.R. Lynam, K. Markon, J.D. Miller, T.E. Moffitt, L.C. Morey, S.N. Mullins-Sweatt, J. Ormel, C. J. Patrick, D.A. Regier, L. Rescorla, C.J. Ruggero, D.B. Samuel, M. Sellbom, L. J. Simms, A.E. Skodol, T. Slade, S.C. South, J.L. Tackett, I.D. Waldman, M. A. Waszczuk, T.A. Widiger, A.G.C. Wright, M. Zimmerman, The hierarchical taxonomy of psychopathology (HiTOP): a dimensional alternative to traditional nosologies, *J. Abnorm. Psychol.* 126 (4) (2017) 454–477, <https://doi.org/10.1037/abn0000258>.
- [21] T.A. Widiger, B. Bach, M. Chmielewski, L.A. Clark, C. DeYoung, C.J. Hopwood, R. Kotov, R.F. Krueger, J.D. Miller, L.C. Morey, S.N. Mullins-Sweatt, C.J. Patrick, A. L. Pincus, D.B. Samuel, M. Sellbom, S.C. South, J.L. Tackett, D. Watson, M. H. Waugh, A.G.C. Wright, J. Zimmermann, R.M. Bagby, D.C. Cicero, C.C. Conway, B. De Clercq, A.R. Docherty, N.R. Eaton, K.T. Forbush, J.D. Haltigan, M.Y. Ivanova, R.D. Latzman, D.R. Lynam, K.E. Markon, U. Reininghaus, K.M. Thomas, Criterion A of the AMPD in HiTOP, *J. Pers. Assess.* 101 (4) (2019) 345–355, <https://doi.org/10.1080/00223891.2018.1465431>.
- [22] R.J. Marek, J.L. Anderson, A.M. Tarescavage, K. Martin-Fernandez, S. Haugh, A. R. Block, L.J. Heinberg, X.F. Jimenez, Y.S. Ben-Porath, Elucidating somatization in a dimensional model of psychopathology across medical settings, *J. Abnorm. Psychol.* 129 (2) (2020) 162–176, <https://doi.org/10.1037/abn0000475>.
- [23] World Health Organization, *The ICD-10 Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines*, World Health Organization, Geneva, 1992.
- [24] T.A. Widiger, The categorical distinction between personality and affective disorders, *J. Personal. Disord.* 3 (2) (1989) 77–91, <https://doi.org/10.1521/pedi.1989.3.2.77>.
- [25] P.S. Links, R. Eynan, The relationship between personality disorders and Axis I psychopathology: deconstructing comorbidity, *Annu. Rev. Clin. Psychol.* 9 (2013) 529–554, <https://doi.org/10.1146/annurev-clinpsy-050212-185624>.
- [26] A.C. Ruocco, Re-evaluating the distinction between Axis I and Axis II disorders: the case of borderline personality disorder, *J. Clin. Psychol.* 61 (12) (2005) 1509–1523, <https://doi.org/10.1002/jclp.20205>.
- [27] A.E. Skodol, J.M. Oldham, S.E. Hyler, H.D. Kellman, N. Doidge, M. Davies, Comorbidity of DSM-III-R eating disorders and personality disorders, *Int. J. Eat. Disord.* 14 (4) (1993) 403–416, [https://doi.org/10.1002/1098-108x\(199312\)14:4<403::aid-eat2260140403>3.0.co;2-x](https://doi.org/10.1002/1098-108x(199312)14:4<403::aid-eat2260140403>3.0.co;2-x).
- [28] D. Westen, J. Shedler, Revising and assessing axis II, part I: developing a clinically and empirically valid assessment method, *Am. J. Psychiatry* 156 (2) (1999) 258–272, <https://doi.org/10.1176/ajp.156.2.258>.
- [29] T.J. Trull, K.J. Sher, C. Minks-Brown, J. Durbin, R. Burr, Borderline personality disorder and substance use disorders: a review and integration, *Clin. Psychol. Rev.* 20 (2) (2000) 235–253, [https://doi.org/10.1016/s0272-7358\(99\)00028-8](https://doi.org/10.1016/s0272-7358(99)00028-8).
- [30] D. Denys, N. Tenney, H.J. van Megen, F. de Geus, H.G. Westenberg, Axis I and II comorbidity in a large sample of patients with obsessive-compulsive disorder, *J. Affect. Disord.* 80 (2–3) (2004) 155–162, [https://doi.org/10.1016/s0165-0327\(03\)00056-9](https://doi.org/10.1016/s0165-0327(03)00056-9).
- [31] R.T. Mulder, Depression and personality disorder, *Curr. Psychiatry Rep.* 6 (1) (2004) 51–57, <https://doi.org/10.1007/s11920-004-0039-3>.
- [32] P. Cohen, H. Chen, T.N. Crawford, J.S. Brook, K. Gordon, Personality disorders in early adolescence and the development of later substance use disorders in the general population, *Drug Alcohol Depend.* 88 Suppl 1 (Suppl. 1) (2007) S71–S84, <https://doi.org/10.1016/j.drugalcdep.2006.12.012>.
- [33] N. Dowling, S. Cowlshaw, A. Jackson, S. Merkouris, K. Francis, D. Christensen, The prevalence of comorbid personality disorders in treatment-seeking problem gamblers: a systematic review and meta-analysis, *J. Personal. Disord.* 29 (2014) 1–20, <https://doi.org/10.1521/pedi.2014.28.168>.
- [34] Y. Wei, T. Zhang, A. Chow, Y. Tang, L. Xu, Y. Dai, X. Liu, T. Su, X. Pan, Y. Cui, Z. Li, K. Jiang, Z. Xiao, Y. Tang, J. Wang, Co-morbidity of personality disorder in schizophrenia among psychiatric outpatients in China: data from epidemiologic survey in a clinical population, *BMC Psychiatry* 16 (1) (2016) 224, <https://doi.org/10.1186/s12888-016-0920-8>.
- [35] M. Kountza, G. Garyfallos, D. Ploumpidis, E. Varsou, I. Gkiouzeas, The psychiatric comorbidity of anorexia nervosa: a comparative study in a population of French and Greek anorexic patients, *Encephale* 44 (5) (2018) 429–434, <https://doi.org/10.1016/j.encep.2017.07.005>.
- [36] S. Jahng, T.J. Trull, P.K. Wood, S.L. Tragesser, R. Tomko, J.D. Grant, K.K. Bucholz, K.J. Sher, Distinguishing general and specific personality disorder features and implications for substance dependence comorbidity, *J. Abnorm. Psychol.* 120 (3) (2011) 656–669, <https://doi.org/10.1037/a0023539>.
- [37] L.A. Clark, Assessment and diagnosis of personality disorder: perennial issues and an emerging reconceptualization, *Annu. Rev. Psychol.* 58 (2007) 227–257, <https://doi.org/10.1146/annurev.psych.57.102904.190200>.
- [38] L.C. Morey, K.T. Benson, A.J. Busch, A.E. Skodol, Personality disorders in DSM-5: emerging research on the alternative model, *Curr. Psychiatry Rep.* 17 (4) (2015) 24, <https://doi.org/10.1007/s11920-015-0558-0>.
- [39] T.A. Widiger, T.J. Trull, Plate tectonics in the classification of personality disorder: shifting to a dimensional model, *Am. Psychol.* 62 (2) (2007) 71–83, <https://doi.org/10.1037/0003-066x.62.2.71>.
- [40] H.C. Kraemer, A. Noda, R. O'Hara, Categorical versus dimensional approaches to diagnosis: methodological challenges, *J. Psychiatr. Res.* 38 (1) (2004) 17–25, [https://doi.org/10.1016/S0022-3956\(03\)00097-9](https://doi.org/10.1016/S0022-3956(03)00097-9).
- [41] M. Aragona, L. Tarsitani, S. De Nitto, M. Inghilleri, DSM-IV-TR “pain disorder associated with psychological factors” as a nonhysterical form of somatization, *Pain Res. Manag.* 13 (1) (2008) 13–18, <https://doi.org/10.1155/2008/953618>.
- [42] W.L. Huang, T.T. Chen, I.M. Chen, L.R. Chang, Y.H. Lin, S.C. Liao, S.S. Gau, Harm avoidance and persistence are associated with somatoform disorder psychopathology: a study in Taiwan, *J. Affect. Disord.* 196 (2016) 83–86, <https://doi.org/10.1016/j.jad.2016.02.009>.
- [43] R. Conrad, G. Schilling, C. Bausch, J. Nadstawek, H.C. Wartenberg, I. Wegener, F. Geiser, K. Imbierowicz, R. Liedtke, Temperament and character personality profiles and personality disorders in chronic pain patients, *Pain* 133 (1–3) (2007) 197–209, <https://doi.org/10.1016/j.pain.2007.07.024>.
- [44] M. Erkcic, J. Bailer, S.C. Fenske, S.N.L. Schmidt, J. Trojan, A. Schröder, P. Kirsch, D. Mier, Impaired emotion processing and a reduction in trust in patients with somatic symptom disorder, *Clin. Psychol. Psychother.* 25 (1) (2018) 163–172, <https://doi.org/10.1002/cpp.2151>.
- [45] J. Garcia-Campayo, M. Alda, N. Sobradie, B. Oliván, A. Pascual, Personality disorders in somatization disorder patients: a controlled study in Spain, *J. Psychosom. Res.* 62 (6) (2007) 675–680, <https://doi.org/10.1016/j.jpsychores.2006.12.023>.
- [46] T. Hyphantis, P. Gouli, A.F. Carvalho, Personality traits, defense mechanisms and hostility features associated with somatic symptom severity in both health and disease, *J. Psychosom. Res.* 75 (4) (2013) 362–369, <https://doi.org/10.1016/j.jpsychores.2013.08.014>.

- [47] R. Noyes Jr., D.R. Langbehn, R.L. Happel, L.R. Stout, B.A. Muller, S.L. Longley, Personality dysfunction among somatizing patients, *Psychosomatics* 42 (4) (2001) 320–329, <https://doi.org/10.1176/appi.psy.42.4.320>.
- [48] S.D. van Dijk, D. Hanssen, P. Naarding, P. Lucassen, H. Comijs, R. Oude Voshaar, Big Five personality traits and medically unexplained symptoms in later life, *Eur. Psychiatry* 38 (2016) 23–30, <https://doi.org/10.1016/j.eurpsy.2016.05.002>.
- [49] C.R. Cloninger, T.R. Przybeck, D.M. Svrakic, R.D. Wetzel, *The Temperament and Character Inventory (TCI): A Guide to its Development and Use*, Center for Psychobiology of Personality Washington University, St. Louis, MI, 1994.
- [50] T. Hyphantis, The Greek version of the Defense Style Questionnaire: psychometric properties in three different samples, *Compr. Psychiatry* 51 (6) (2010) 618–629, <https://doi.org/10.1016/j.comppsy.2010.03.005>.
- [51] J.J. Gross, O.P. John, Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being, *J. Pers. Soc. Psychol.* 85 (2) (2003) 348–362, <https://doi.org/10.1037/0022-3514.85.2.348>.
- [52] R.M. Bagby, J.D.A. Parker, G.J. Taylor, The twenty-item Toronto Alexithymia scale—I. Item selection and cross-validation of the factor structure, *J. Psychosom. Res.* 38 (1) (1994) 23–32, [https://doi.org/10.1016/0022-3999\(94\)90005-1](https://doi.org/10.1016/0022-3999(94)90005-1).
- [53] C.E. Sleep, B. Weiss, D.R. Lynam, J.D. Miller, The DSM-5 section III personality disorder criterion A in relation to both pathological and general personality traits, *Personal Disord.* 11 (3) (2020) 202–212, <https://doi.org/10.1037/per0000383>.
- [54] F. Pedrosa Gil, N. Ridout, H. Kessler, M. Neuffer, C. Schoechlin, H.C. Traue, M. Nickel, Facial emotion recognition and alexithymia in adults with somatoform disorders, *Depress Anxiety* 26 (1) (2009) E26–E33, <https://doi.org/10.1002/da.20456>.
- [55] S. Simonsen, I.U. Eikenaes, B. Bach, E. Kvarstein, M. Gondan, S.B. Møller, T. Wilberg, Level of alexithymia as a measure of personality dysfunction in avoidant personality disorder, *Nord. J. Psychiatry* (2020) 1–9, <https://doi.org/10.1080/08039488.2020.1841290>.
- [56] R.J. Brown, D. Skehan, A. Chapman, E.P. Perry, K.J. McKenzie, D.M. Lloyd, C. Babbs, P. Paine, E. Poliakoff, Physical symptom reporting is associated with a tendency to experience somatosensory distortion, *Psychosom. Med.* 74 (6) (2012) 648–655, <https://doi.org/10.1097/PSY.0b013e3182595358>.
- [57] K. Honkalampi, N. Flink, S.M. Lehto, A. Ruusunen, H. Koivumaa-Honkanen, M. Valkonen-Korhonen, H. Viinamäki, Adverse childhood experiences and alexithymia in patients with major depressive disorder, *Nord. J. Psychiatry* 74 (1) (2020) 45–50, <https://doi.org/10.1080/08039488.2019.1667430>.
- [58] D.P. Bernstein, J.A. Stein, L. Handelman, Predicting personality pathology among adult patients with substance use disorders: effects of childhood maltreatment, *Addict. Behav.* 23 (6) (1998) 855–868, [https://doi.org/10.1016/S0306-4603\(98\)00072-0](https://doi.org/10.1016/S0306-4603(98)00072-0).
- [59] S. Hahn, K. Thompson, T. Wills, V. Stern, N. Budner, The difficult doctor-patient relationship: somatization, personality and psychopathology, *J. Clin. Epidemiol.* 47 (1994) 647–657, [https://doi.org/10.1016/0895-4356\(94\)90212-7](https://doi.org/10.1016/0895-4356(94)90212-7).
- [60] A.P. Chioqueta, T.C. Stiles, Suicide risk in patients with somatization disorder, *Crisis* 25 (1) (2004) 3–7, <https://doi.org/10.1027/0227-5910.25.1.3>.
- [61] M. Zunhammer, H. Eberle, P. Eichhammer, V. Busch, Somatic symptoms evoked by exam stress in university students: the role of alexithymia, neuroticism, anxiety and depression, *PLoS One* 8 (12) (2013), e84911.
- [62] J. Neeleman, R. Bijl, J. Ormel, Neuroticism, a central link between somatic and psychiatric morbidity: path analysis of prospective data, *Psychol. Med.* 34 (3) (2004) 521–531, <https://doi.org/10.1017/s0033291703001193>.
- [63] J.G. Rosmalen, J. Neeleman, R.O. Gans, P. de Jonge, The association between neuroticism and self-reported common somatic symptoms in a population cohort, *J. Psychosom. Res.* 62 (3) (2007) 305–311, <https://doi.org/10.1016/j.jpsychores.2006.10.014>.
- [64] J. Zimmermann, J.C. Ehrenthal, M. Cierpka, H. Schauenburg, S. Doering, C. Benecke, Assessing the level of structural integration using operationalized psychodynamic diagnosis (OPD): implications for DSM–5, *J. Pers. Assess.* 94 (5) (2012) 522–532, <https://doi.org/10.1080/00223891.2012.700664>.
- [65] L.A. Clark, E. Ro, Three-pronged assessment and diagnosis of personality disorder and its consequences: personality functioning, pathological traits, and psychosocial disability, *Personal Disord.* 5 (1) (2014) 55–69, <https://doi.org/10.1037/per0000063>.
- [66] F. Rezaei, A. Hemmati, K. Rahmani, S. Komasi, A systematic review of personality temperament models related to somatoform disorder with main focus on meta-analysis of Cloninger's theory components, *Indian J. Psychiatry* 62 (5) (2020) 462–469, https://doi.org/10.4103/psychiatry.IndianJPsychiatry.345_20.
- [67] A. Aluja, A. Blanch, The five and seven factors personality models: differences and similitude between the TCI-R, NEO-FFI-R and ZKPQ-50-CC, *Span. J. Psychol.* 14 (2) (2011) 659–666, https://doi.org/10.5209/rev_sjop.2011.v14.n2.14.
- [68] G. Garyfallos, A. Adamopoulou, A. Karastergiou, M. Voikli, N. Ikonomidis, S. Donias, E. Dimitriou, Somatoform disorders: comorbidity with other DSM-III-R psychiatric diagnoses in Greece, *Compr. Psychiatry* 40 (4) (1999) 299–307, [https://doi.org/10.1016/s0010-440x\(99\)90131-1](https://doi.org/10.1016/s0010-440x(99)90131-1).
- [69] M.S. van Noorden, E.M. van Fenema, N.J. van der Wee, Y.R. van Rood, I.V. Carlier, F.G. Zitman, E.J. Giltay, Predicting outcomes of mood, anxiety and somatoform disorders: the Leiden routine outcome monitoring study, *J. Affect. Disord.* 142 (1–3) (2012) 122–131, <https://doi.org/10.1016/j.jad.2012.03.051>.
- [70] R.F. Bornstein, From structure to process: on the integration of AMPD and HiTOP, *J. Pers. Assess.* 101 (4) (2019) 360–366, <https://doi.org/10.1080/00223891.2018.1501696>.
- [71] A. Caspi, R.M. Houts, D.W. Belsky, S.J. Goldman-Mellor, H. Harrington, S. Israel, M.H. Meier, S. Ramrakha, I. Shalev, R. Poulton, T.E. Moffitt, The p factor: one general psychopathology factor in the structure of psychiatric disorders? *Clin. Psychol. Sci.* 2 (2) (2014) 119–137, <https://doi.org/10.1177/2167702613497473>.
- [72] L.C. Morey, Thoughts on the assessment of the DSM-5 alternative model for personality disorders: comment on Sleep et al. (2019), *Psychol. Assess.* 31 (10) (2019) 1192–1199, <https://doi.org/10.1037/pas0000710>.
- [73] J. Zimmermann, A. Kerber, K. Reik, C.J. Hopwood, R.F. Krueger, A brief but comprehensive review of research on the alternative DSM-5 model for personality disorders, *Curr. Psychiatry Rep.* 21 (9) (2019) 92, <https://doi.org/10.1007/s11920-019-1079-z>.
- [74] C. Sharp, A. Wright, J. Fowler, B. Frueh, J. Allen, J. Oldham, L. Clark, The structure of personality pathology: both general ('g') and specific ('s') factors? *J. Abnorm. Psychol.* 124 (2015) <https://doi.org/10.1037/abn0000033>.
- [75] A.G. Wright, C.J. Hopwood, A.E. Skodol, L.C. Morey, Longitudinal validation of general and specific structural features of personality pathology, *J. Abnorm. Psychol.* 125 (8) (2016) 1120–1134, <https://doi.org/10.1037/abn0000165>.
- [76] L.C. Morey, H. Berghuis, D.S. Bender, R. Verheul, R.F. Krueger, A.E. Skodol, Toward a model for assessing level of personality functioning in DSM-5, part II: empirical articulation of a core dimension of personality pathology, *J. Pers. Assess.* 93 (4) (2011) 347–353, <https://doi.org/10.1080/00223891.2011.577853>.
- [77] G.T. Smith, E.A. Atkinson, H.A. Davis, E.N. Riley, J.R. Oltmanns, The general factor of psychopathology, *Annu. Rev. Clin. Psychol.* 16 (2020) 75–98, <https://doi.org/10.1146/annurev-clinpsy-071119-115848>.
- [78] L.J. Simms, J.J. Prisciandaro, R.F. Krueger, D.P. Goldberg, The structure of depression, anxiety and somatic symptoms in primary care, *Psychol. Med.* 42 (1) (2012) 15–28, <https://doi.org/10.1017/s0033291711000985>.
- [79] K.E. Markon, Modeling psychopathology structure: a symptom-level analysis of Axis I and II disorders, *Psychol. Med.* 40 (2) (2010) 273–288, <https://doi.org/10.1017/S0033291709990183>.
- [80] R. Kotov, C.J. Ruggero, R.F. Krueger, D. Watson, Q. Yuan, M. Zimmerman, New dimensions in the quantitative classification of mental illness, *Arch. Gen. Psychiatry* 68 (10) (2011) 1003–1011, <https://doi.org/10.1001/archgenpsychiatry.2011.107>.
- [81] J.L. McNulty, S.R. Overstreet, Viewing the MMPI–2–RF structure through the personality psychopathology five (PSY–5) lens, *J. Pers. Assess.* 96 (2) (2014) 151–157, <https://doi.org/10.1080/00223891.2013.840305>.
- [82] J.R. Oltmanns, G.T. Smith, T.F. Oltmanns, T.A. Widiger, General factors of psychopathology, personality, and personality disorder: across domain comparisons, *Clin. Psychol. Sci.* 6 (4) (2018) 581–589, <https://doi.org/10.1177/2167702617750150>.
- [83] G. Michelini, I.M. Palumbo, C.G. DeYoung, R.D. Litzman, R. Kotov, Linking RDoC and HiTOP: a new interface for advancing psychiatric nosology and neuroscience, *Clin. Psychol. Rev.* 86 (2021) 102025, <https://doi.org/10.1016/j.cpr.2021.102025>.
- [84] L.C. Heathcote, Commentary: from symptoms to sensations: moving toward a normal psychology of somatic experiences in youth, *J. Pediatr. Psychol.* 44 (7) (2019) 859–861, <https://doi.org/10.1093/jpepsy/jsz028>.

Supplementary Material

Search date: 10 July 2020, 2:50 p.m.

Search terms:

((somatization OR somatizing OR somatisation OR somatising OR “somatic symptom” OR “somatic symptoms” OR “somatic complaint” OR “somatic complaints” OR “somatic symptom disorder” OR “somatic symptom disorders” OR “bodily distress disorder” OR “bodily distress syndrome” OR “bodily stress syndrome” OR “conversion disorder “ OR “conversion disorders” OR conversion OR “functional neurological symptom disorder” OR “functional neurological symptom disorders“ OR psychosomatic OR “psychosomatic disorder” OR “psychosomatic disorders” OR “psychophysiological disorder” OR “psychophysiological disorders” OR “briquet syndrome” OR “briquet’s syndrome” OR “somatoform disorder” OR “somatoform disorders” OR “somatization disorder” OR “somatization disorders” OR “somatisation disorder” OR “somatisation disorders” OR “multisomatoform disorder” OR “multisomatoform disorders” OR “psychogenic disorder” OR “pychogenic disorders” OR “psychovegetative disorder” OR “psychovegetative disorders” OR “physical complaint” OR “physical complaints” OR “neurasthenia” OR “medically unexplained symptom” OR “medically unexplained symptoms” OR “medically unexplained symptom disorder” OR “medically unexplained complaint” OR “medically unexplained complaints” OR “medically unexplained physical symptom” OR “medically unexplained physical symptoms”) AND (personality OR “personality traits” OR “personality trait” OR character OR temperament OR persona OR identity OR “Big 5” OR “Big Five” OR “Big-Five” OR “Big-5” OR “five factor model” OR “personality characteristics” OR “personality characteristic” OR “personality type” OR introversion OR openness OR conscientiousness OR extraversion OR agreeableness OR neuroticism OR detachment OR “negative affectivity” OR antagonism OR disinhibition OR psychoticism OR anankastia OR dissociality OR “borderline pattern” OR “borderline personality organization” OR “borderline personality organisation” OR “personality organization” OR “personality organisation” OR “rigid perfectionism” OR perseveration OR “personality difficulty” OR “personality disorder” OR “personality disorders” OR “personality functioning” OR “personality dysfunctioning” OR “personality function” OR “personality dysfunction” OR “level of personality functioning” OR “level of personality functioning scale” OR “AMPD”

OR “alternative model of personality functioning” OR “personality impairment” OR “personality impairments” OR “personality trait domain” OR “personality trait domains” OR “personality structure” OR “axis II disorder” OR “axis II disorders” OR “axis-II-disorder” OR “axis-II-disorders” OR “axis-II disorder” OR “axis-II disorders” OR “paranoid personality disorder” OR “schizoid personality disorder” OR “schizotypal personality disorder” OR “antisocial personality disorder” OR “dissocial personality disorder” OR “emotionally unstable personality disorder” OR “borderline personality disorder” OR “impulsive personality disorder” OR “histrionic personality disorder” OR “narcissistic personality disorder” OR “avoidant personality disorder” OR “anxious personality disorder” OR “dependent personality disorder” OR “obsessive-compulsive personality disorder” OR “anankastic personality disorder” OR “depressive personality disorder” OR “negativistic personality disorder” OR “unspecified personality disorder” OR “other specific personality disorder” OR “mixed personality disorder” OR “other personality disorder”) AND (DSM-5 OR “DSM 5” OR ICD-11 OR “ICD 11” OR “dimensional approach of personality disorders” OR “dimensional classification of personality disorders” OR “dimensional assessment of personality disorders” OR “dimensional models of personality disorders”))

Results:

Journal

Scopus	5046
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Publication language: English. Keywords: human, humans. adult.

WOS (Web of Science Core collection)	31
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Publication language: English,

PubMed	965
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Publication language: English. Species: human. Age: only adults

Total	6042
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Removing duplicates (96 duplicates)	5946
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Appendix B

Study II

Macina, C. *, Kerber, A. *, Zimmermann, J., Ohse, L., Kampe, L., Mohr, J., Walter, M., Hörz- Sagstetter, S.*, Wrege, J.S.* (2023). Evaluating the psychometric properties of the German Self and Interpersonal Functioning Scale (SIFS). *Journal of Personality Assessment*, 1-13. <https://doi.org/10.1080/00223891.2023.2268199>

* Shared first authorship and shared last authorship

Evaluating the Psychometric Properties of the German Self and Interpersonal Functioning Scale (SIFS)

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ABSTRACT

The Self and Interpersonal Functioning Scale (SIFS) is a 24-item self-report questionnaire assessing personality functioning according to the alternative DSM-5 model for personality disorders. We evaluated the German SIFS version in a total sample of 886 participants from Germany and Switzerland. Its factor structure was investigated with confirmatory factor analysis comparing bifactor models with two specific factors (self- and interpersonal functioning) and four specific factors (identity, self-direction, empathy, and intimacy). The SIFS sum and domain scores were tested for reliability and convergent validity with self-report questionnaires and interviews for personality functioning, -organization, -traits, -disorder categories, and well-being. None of the bifactor models yielded good model fit, even after excluding two items with low factor loadings and including a method factor for reverse-keyed items. Based on a shortened 22-item SIFS version, models suggested that the g-factor explained 52.9–59.6% of the common variance and that the SIFS sum score measured the g-factor with a reliability of .68–.81. Even though the SIFS sum score showed large test-retest reliability and correlated strongly with well-established self-report questionnaires and interviews, the lack of structural validity appears to be a serious disadvantage of the SIFS compared to existing self-reports questionnaires of personality functioning.

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The alternative model for personality disorders (AMPD) in Section III of the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; APA, 2013) and the International Classification of Diseases (11th ed.; ICD-11; WHO, 2018) both present a dimensional model for the assessment of personality disorders (PDs). Therein, several shortcomings of the categorical approach of PDs in the DSM-IV (APA, 1994), DSM-5 Section II (APA, 2013), and the ICD-10 (WHO, 1992) have been addressed. Empirically, categorical PD models suffer from low reliability (Clark, 2007), low discriminant and convergent validity, overlaps and comorbidity of the PD categories, arbitrary threshold values, and temporal instability of the categorical PD diagnoses (Morey et al., 2015; Widiger & Trull, 2007). In the attempt to overcome some of these weaknesses of the categorical PD approach, the AMPD delineates the common denominator of PDs as impairments in self and interpersonal functioning (Criterion A) and provides a direct assessment of severity with the Level of Personality Functioning Scale (LPFS; Bender et al., 2011).

Criterion A is operationalized in the LPFS by impairments in self-functioning, comprising the domains of identity (ID) and self-direction (SD), and impairments in interpersonal functioning, comprising the domains of

empathy (EM) and intimacy (INT). Each of the four domains is defined by three subdomains, resulting in a total of twelve subdomains of personality functioning. Severity levels of the LPFS reach from no or low impairments (0) to extreme impairments (4). For a PD diagnosis, at least moderate impairment (2) in overall personality functioning is required. In addition, the DSM-5 AMPD contains Criterion B, which consists of five pathological personality trait domains as follows: negative affectivity, disinhibition, detachment, antagonism, and psychoticism (APA, 2013). It has been argued that, while Criterion A can be understood as the underlying condition of a PD, Criterion B comprises the consequences of these impaired capacities conceptualized in Criterion A, which may account for the large intercorrelation of the two criteria (Sharp & Wall, 2021). Thus, the LPFS avoids the reductionistic division into healthy and disordered subjects, takes into account the dimensional nature of personality pathology, and efficiently addresses a severity factor common to all PDs (Zimmermann, Hopwood, et al., 2023). In addition, a severity continuum may help raise awareness that a PD is modifiable, thereby reducing stigma against subjects with PDs (Tyrer et al., 2015). Morey et al. (2013) found that clinician ratings of the LPFS are incrementally associated with prognosis, functioning, and treatment intensity needs

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when controlling for all ten PD categories of the DSM-IV. Therefore, a direct assessment of Criterion A *via* LPFS seems clinically useful, although we acknowledge that other authors are more skeptical about the validity and utility of Criterion A (e.g., Widiger & Hines, 2022; Wright et al., 2022).

Historically, the LPFS was conceptualized as a clinical expert rating and only later structured interviews and self-report questionnaires were developed. Today, there are several interviews for assessing personality functioning, including the Structured Clinical Interview for the AMPD—Module I (SCID-5-AMPD-I; Bender et al., 2018) and the Semi-Structured Interview for personality functioning in DSM-5 (STIP-5.1; Hutschbaud et al., 2017). Furthermore, several self-report questionnaires for the assessment of personality functioning were developed in addition to the existing clinical interviews, including the 80-item LPFS-Self Report (LPFS-SR; Morey, 2017), the 12-item LPFS-Brief Form 2.0 (LPFS-BF 2.0; Weekers et al., 2019), the 12-item LPFS-SR of Criterion A (LPFS-SRA; Roche et al., 2016, 2018), the 132-item DSM-5 Level of Personality Functioning Questionnaire (DLOPFQ; Huprich et al., 2018), and the 23-item DLOPFQ- short form (DLOPFQ-SF; Siefert et al., 2020). Current studies are investigating their reliability, validity, and feasibility in clinical practice (for overviews, see Birkhölzer et al., 2021; Zimmermann, Hopwood, et al., 2023).

Another self-report questionnaire capturing personality functioning is the 24-item Self and Interpersonal Functioning Scale (SIFS), which was developed in French (Gamache et al., 2019). This measure is not quite as brief as the LPFS-BF 2.0 (i.e., twice as many items), but provides four domain scales (ID, SD, EM, INT) instead of only two scales for the dimensions of self- and interpersonal functioning. However, it is still time-efficient for subjects to complete (compared to the LPFS-SR or DLOPFQ) and therefore may fill a gap in the repertoire of self-report assessments of personality functioning. Additionally, the first study with the original version of the SIFS showed excellent internal consistency for the global score, strong associations with relevant personality constructs (e.g., low life satisfaction, aggression, identity diffusion, primitive defense, low empathy, low self-esteem, narcissistic and borderline symptoms, and pathological personality trait domains) and good test-retest reliability in clinical and non-clinical groups for all four SIFS domain scales. Nevertheless, two items (items 6 and 16) seemed to be problematic, one of which (item 16: “I have little interest for other people’s feelings or problems”) was excluded from testing the factor analytical models because of missing discrimination between clinical and non-clinical groups (Gamache et al., 2019). Even so, Gamache et al. (2019) decided to retain the item for computing scale scores because of its relevance to forensic settings. Additionally, item 6 (“I recognize myself in how others describe me”) showed low item-scale correlations but was not excluded from factor-analytic analyses subdomain based on the rationale that it conceptually represents the facet *accuracy of self-appraisal*. Confirmatory factor analytic investigations of the original French version, testing a one-factor model, a two-factor (self and interpersonal) model, a

four-factor (ID, SD, EM, INT) model, a second-order model (four factors loading on a g-factor), and a bifactor model with four specific factors (all items loading on a g-factor and the four factors) found that the second-order model showed the best fit (good fit indices; Gamache et al., 2019).

Meanwhile, the SIFS has been applied in several further studies showing apparently promising results. These include relatively strong associations with Criterion B traits (except for antagonism; Leclerc et al., 2023; Roche & Jaweed, 2023), physical aggression (Leclerc et al., 2022), stalking (Gamache et al., 2023), resilience in police officers (Angehrn et al., 2023), discrimination of different severity profiles within patients with Borderline pathology (Gamache, Savard, Leclerc, Payant, Côté, et al., 2021), good content validity with respect to the construct definitions in the AMPD (Waugh et al., 2021), associations with emotional, behavioral, and thought problem risks in pregnant women requiring monitoring (Gamache et al., 2022), and diagnostic value in clinical practice (Samykin et al., 2023). In addition, the SIFS has been discussed as a screener for assessing PDs according to ICD-11, whereby cutoff values for the five severity levels were empirically determined (Gamache, Savard, Leclerc, Payant, Berthelot, et al., 2021). Nevertheless, there are also problematic results of the original SIFS version, especially in terms of reverse-keyed items and specific item wordings, which has led to an adapted SIFS version, which is not psychometrically validated yet (Leclerc et al., 2022). So far, the SIFS has not been psychometrically evaluated in any other language than French. Therefore, it has not yet been possible to determine whether the problematic factor analytic aspects previously found by Gamache et al. (2019) and Leclerc et al. (2022) are language-specific or whether these issues are more fundamental and affect the instrument itself. Most evident, the SIFS has never been validated using standardized clinical interviews developed for Criterion A, indicating a fundamental gap in the current state of the evaluation of the SIFS.

The current study contributes to the literature on the SIFS by (1) testing the factor structure of the German SIFS items, (2) investigating the internal consistency and test-retest reliability of the scale scores, and (3) testing their convergent validity across three different PD interviews and various associated self-report questionnaires for personality functioning, personality organization, pathological personality trait domains, and well-being in a combined sample covering the full spectrum of personality functioning. Our overarching goal was to evaluate whether the German SIFS represents a self-report measure that is more fine-grained than the LPFS-BF 2.0 but less time-intensive than some other questionnaires assessing the severity of impairments in personality functioning. First, we tested whether the SIFS items indeed represent four differentiable domains as claimed by Gamache et al. (2019), or whether, as in the LPFS-BF 2.0, only the two overarching dimensions of self- and interpersonal functioning are distinguishable. Moreover, since the construct of personality functioning implies a strong general factor (e.g., Bliton et al., 2022; Zimmermann et al., 2020), we addressed this question by comparing bifactor models with one general factor and two or four

specific factors. Second, we expected that internal consistency and test-retest reliability of the SIFS sum score, as well as of the domain scores (except for SD; Gamache et al., 2019) are good. In the case that the four domains are reliably measurable beyond the general factor, they could be used to determine a focus for the therapeutic process, therefore increasing clinical utility (Hopwood et al., 2018). Third, we expected that convergent validity of the SIFS sum score is good as well, as indicated by large correlations with the total scores of the SCID-5-AMPD-I, STiP-5.1, and of the Structured Clinical Interview for DSM-5—PDs (SCID-5-PD; Beesdo-Baum et al., 2019a) categories as well as of self-report measures of personality functioning, personality organization, pathological personality trait domains, and well-being. For the SIFS domain scores, we additionally hypothesized whether they correlate more strongly with the corresponding domain scores of the measures used to test convergent validity (e.g., SIFS ID is expected to correlate more strongly with STiP-5.1 ID than SIFS EM). Note that our study is the first to examine the convergent validity of the SIFS score with a multimethod design, thus excluding common method bias as an explanation for potential large correlations.

Methods

Procedure and participants

Participants were enrolled in a multi-center study, a cooperation between two research groups on the AMPD (Berlin-Basel). The present study includes a total sample of $n=886$. It is composed of three different subsamples, a German-speaking clinical sample from different cities in Germany ($n=137$), a Swiss-German mixed clinical and non-clinical sample from Basel ($n=116$), and a German-speaking non-clinical sample from the panel provider Clickworker ($n=633$). In total, participants were aged between 18 and 66 years ($M=37.2$, $SD=12.5$), thereof 425 (48.0%) women. The participants' mean age was in the Basel sample: $M=28.3$ years, $SD=11.6$; in the German clinical sample: $M=32.6$ years, $SD=10.5$; and in the Clickworker sample: $M=39.8$ years, $SD=12.0$. Furthermore, 63.8% of the Basel, 70.1% of the German clinical sample, and 40.3% of the Clickworker sample were female, and 67.2, 76.6, and 88.8%, respectively were employed. Moreover, 11.2, 17.5, and 27.6%, respectively had children, 17.2, 35.7, and 45.9%, respectively had a university degree, and the majority did not take medication (51.7, 67.9, and 90.7%, respectively).

All participants of the multicenter study gave written informed consent. Two different ethics committees, the Northwestern and Central Swiss Ethics Committee and the Ethics Committee of Psychologische Hochschule Berlin, approved the study for the respective study sites. Participants were included in both clinical samples if they (1) were seeking psychotherapeutic treatment, (2) were at least 18 years old, and (3) had sufficient knowledge of German. Patients with acute suicidality, psychosis, mental retardation, or cognitive deficits due to substance or medication use were excluded. Total data collection took place between July

2020 and April 2022. All self-report questionnaires were collected online using the platform formr (Arslan et al., 2020). This study was not preregistered.

Basel mixed clinical and non-clinical sample

The Basel sample included patients of the outpatient psychotherapeutic department of the University Clinics Basel ($n=87$) and nonclinical subjects (NC) of the University of Basel marketplace website ($n=29$). Patients were recruited based on the clinic's standardized clinical procedures. Either they sought therapy by themselves or clinicians sent the patients for treatment. Psychiatric inpatients were already in inpatient, mostly acute treatment for some weeks. After an indicative preliminary interview based on the Operationalized Psychodynamic Diagnostic (OPD-2; OPD Task Force, 2008) in the outpatient clinic for psychotherapy and psychosomatics (ZPP Ambulanz, UPK), patients gave informed consent. In addition to the sociodemographic data and self-report questionnaires, patients and NCs underwent the STiP-5.1. In the Basel patient sample, three patients were previously excluded because of inconsistent responses, resulting in a sample of $n=87$.¹ The average personality functioning impairment was as follows: 2.3% showed no impairment (STiP-5.1 total <0.5), 8.0% showed mild impairment (STiP-5.1 total ≥ 0.5 and <1.5), 62.1% showed moderate impairment (STiP-5.1 total ≥ 1.5 and <2.5), 27.6% showed severe impairment (STiP-5.1 total ≥ 2.5 and <3.5), and 0% showed extreme impairment (STiP-5.1 total ≥ 3.5). Overall, 56.3% met Criterion A for a PD according to the AMPD (moderate impairment (cutoff total score = 2.0) in personality functioning). The NC sample from Basel underwent the Structured Clinical Interview for DSM-5 Disorders (SCID-5-CV; Beesdo-Baum et al., 2019b) to exclude any mental disorders. In addition, NCs completed the Self-Report Personality Questionnaire for Structured Clinical Interview for DSM-5 (SCID-5-SPQ; Beesdo-Baum et al., 2019a) to exclude categorically defined PDs. Sixty-nine percent of NCs showed no impairments (STiP-5.1 total ≥ 0.5), and 31.0% showed mild impairment (STiP-5.1 total ≥ 0.5 and <1.5) in interview-assessed personality functioning. Data collection was anonymous; none of the Basel patients was financially compensated, but the NCs of the Basel sample received on-site financial compensation of 50 CHF.

German clinical sample

The German clinical part of the study included patients from different centers in Germany (mainly Berlin). Recruitment took place *via* outpatient psychotherapeutic departments ($n=117$; 85.4%), inpatient psychiatric departments ($n=16$; 11.7%), social media ($n=1$; 0.7%), and *via* recommendation from study participants ($n=3$; 2.2%). Patients were assessed by two interviews—the SCID-5-PD and the SCID-5-AMPD-I, as well as by self-report

¹Inconsistent responses were determined by splitting the 24 SIFS items randomly in two 12-item parcels and computing the absolute difference between the two parcel mean scores for each person. An absolute difference equal or greater than two points was considered as indicating inconsistent responding.

questionnaires. Psychiatric inpatients were already in psychotherapeutic treatment for some weeks, while the remaining participants were seeking psychotherapy. None of the patients were excluded because of inconsistent responses (see definition of inconsistent responses in the Basel sample). Personality functioning impairments were as follows: 8.0% showed no impairment (SCID-5-AMPD-I total <0.5), 38.0% showed mild impairment (SCID-5-AMPD-I total ≥ 0.5 and <1.5), 23.4% showed moderate impairment (SCID-5-AMPD-I total ≥ 1.5 and <2.5), 9.5% showed severe impairment (SCID-5-AMPD-I total ≥ 2.5 and <3.5), and 2.2% showed extreme impairment (SCID-5-AMPD-I total ≥ 3.5). Overall, 33.3% met Criterion A for a PD according to the AMPD (moderate impairment (cutoff total score = 2.0) in personality functioning). The German participants received a small financial compensation, excluding the psychiatric inpatients. Data from the German clinical sample has been used for the validation of the German SCID-5-AMPD-I (see Ohse et al., 2023).

German Clickworker sample

A sample of 693 German-speaking subjects from the general population were recruited anonymously *via* the crowdsourcing platform Clickworker. Data was checked for inattentive responses, for which two attention questions were included (e.g., “This is a query to test your attention. Please click the second field from the left”). Fifty-three subjects (7.6%) answered at least one of the two questions incorrectly and were thus excluded. Another four participants (0.6%) were excluded because of questionable codes (e.g., TEST11). Finally, three participants (0.4%) were excluded because of inconsistent responses (see definition of inconsistent response in the Basel sample), resulting in a final sample of $n=633$. The sample received financial compensation (three euros per questionnaire battery) through the Clickworker portal. For a retest assessment, 200 participants out of the first Clickworker population were invited to participate after a time interval of two weeks, of which 157 participants were identified *via* their code.

Measures

Participants in the different samples completed the various test batteries with a total of six self-report questionnaires. The Basel sample ($n=116$) completed the SIFS in addition to the STiP-5.1 interview. The German clinical sample ($n=137$) completed the SCID-5-AMPD-I interview as well as the categorical SCID-5-PD interview and two self-report questionnaires, the SIFS and LPFS-SR. The Clickworker sample ($n=633$) completed the following self-report questionnaires: the SIFS, the LPFS-BF 2.0, the modified Personality Inventory for the DSM-5 Brief Form Plus (PID-BF+M; Bach et al., 2020), the Inventory of Personality Organization (IPO-16; Zimmermann et al., 2013), and the Brief Inventory of Thriving (BIT; Su et al., 2014). A subsample of the Clickworker sample ($n=157$) completed the SIFS a second time after an interval of two weeks.

Semi-Structured Interview for Personality Functioning DSM-5 (STiP-5.1; Hutsebaut et al., 2017; German version translated by Zettl et al., 2019)

The STiP-5.1 assesses Criterion A on a scale from “0=no impairment” to “4=extreme impairment.” It consists of one to four open interview questions for each of the twelve subdomains, e.g., “to what extent are you capable of really being and staying yourself?” In addition, help questions serve to clarify the information given by the participant. Further, there is the possibility to continue with check questions by summarizing and reformulating the participants’ responses and adjusting the information to fit the subdomain’s description. If still no assessment can be made, the interviewer can ask a test question by providing the participant with two options. The German version of the STiP-5.1 shows excellent interrater reliability (intraclass correlation coefficient, ICC[1,1]=.77; Zettl et al., 2019; Zimmermann, Hopwood, et al., 2023). In the patient sample, the STiP-5.1 was assessed by one of four psychodynamic psychologists with varying levels of experience and training. All psychologists were highly experienced in the assessment of PDs and had completed at least one OPD-2 training course (20hr training), which includes the concept of structural integration. This covers different functional domains of psychological processes that can be differentiated along severity levels and thus show high relevance for Criterion A (Zimmermann et al., 2012). One psychologist had a brief training (2hr by the developer Joost Hutsebaut) and taught the other psychologists about the AMPD and the structure of the STiP-5.1. In the NC sample, the STiP-5.1 was assessed by one of two MSc students who had a brief training (2hr by the first author) and rated two videos independently before the study.

Structured Clinical Interview for the AMPD-Module I (SCID-5-AMPD-I; Bender et al., 2018; German version translated by Hörz-Sagstetter et al., in press)

The SCID-5-AMPD-I assesses Criterion A on a scale ranging from “0=no impairment” to “4=extreme impairment.” At the beginning, the interviewer asks eight open screening questions and one to five screening questions for the twelve subdomains, respectively. After the participants have answered the screening questions, the interviewer can further elaborate the given questions in a standardized way based on the assessment of the severity of impairment. The SCID-5-AMPD-I has a funnel structure, i.e., the interviewer checks the preliminary assessment of the screening questions using a pool of standardized closed questions. Patients from the German clinical sample answered the interview questions with respect to the last five years. The German version of the SCID-5-AMPD-I shows excellent interrater (ICC[2,1]=.95) and test-retest reliability (ICC[1,1]=.84) for overall personality functioning (Ohse et al., 2023). For details on raters and interrater reliability see Ohse et al. (2023).

Structured Clinical Interview for DSM-5-PDs (SCID-5-PD; Beesdo-Baum et al., 2019a)

The SCID-5-PD assesses the ten categorical PDs of DSM-5 Section II. Each individual PD criterion can be rated on a

3-point scale, ranging from “0=criterion not met” to “1=criterion met subclinically” to “2=criterion met.” The SCID-5-PD shows overall excellent interrater reliability ($ICC[1, 2]=.84$) for the PD mean scores (Lobbestael et al., 2011).

Structured Clinical Interview for DSM-5 Disorders–Clinician Version (SCID-5-CV; Beesdo-Baum et al., 2019b)

The SCID-5-CV evaluates DSM-5 diagnoses according to ten modules. For each DSM-5 module, there are corresponding interview questions to help the interviewer assess the criteria for each disorder. The SCID-5-CV shows overall good interrater-reliability (kappa levels at least .70) for most diagnoses (Osório et al., 2019).

Self- and Interpersonal Functioning Scale (SIFS; Gamache et al., 2019; German version translated by two authors (CM and JW, 2020)

The SIFS assesses self-reported personality functioning according to Criterion A of the AMPD using 24 items rated on a 5-point Likert scale, ranging from “0=This does not describe me at all” to “4=This describes me totally.” The SIFS was originally developed in French and subsequently translated into English by Gamache et al. (2019). The German translation was done based on the English version. The German translation of the SIFS was done by two authors (CM and JW), and the adequacy of the translated German version was verified through a back-translation by two independent bilingual English-German native speakers who had not seen the original English version. The two authors and the first author of the original SIFS (DG) then checked the back-translation. Regarding the psychometric properties, the internal consistency of the four personality functioning scales (Cronbach’s α) was between .71 and .92, and test-retest reliability was between .63 and .92 (Gamache et al., 2019).

Level of personality functioning–self report (LPFS-SR; Morey, 2017; German version translated by Zimmermann et al., 2020)

The LPFS-SR is a self-report questionnaire, assessing the four intercorrelated domains of Criterion A using 80 items rated on a 4-point Likert scale, ranging from “1=totally false” to “4=very true.” For the evaluation, items are weighted according to their severity within the LPFS conceptualization. Regarding the psychometric properties, the internal consistency (Cronbach’s α) of the original version was between .80 and .92, and test-retest reliability was between .81 and .91 for the global score and the four domain scores (Hopwood et al., 2018).

Level of Personality Functioning–Brief Form 2.0 (LPFS-BF 2.0; Weekers et al., 2019; German version translated by Spitzer et al., 2021)

The LPFS-BF 2.0 assesses Criterion A using 12 items rated on a 4-point Likert scale ranging from “1=completely untrue” to “4=completely true.” The German version of the

LPFS-BF 2.0 shows good reliability (McDonalds $\omega \geq .83$) for the global scale and the two subscales (self- and interpersonal functioning; Spitzer et al., 2021).

Personality Inventory for DSM-5 Brief Form Plus Modified (PID5BF + M; Bach et al., 2020; earlier version developed by Kerber et al., 2022; German version translated by Zimmermann et al., 2014)

The PID5BF+M assesses the Criterion B domains negative affectivity, disinhibition, detachment, antagonism, and psychoticism as well as ICD-11 domain anankastia, using 36 items rated on a 4-point Likert scale ranging from “0=very untrue or often untrue” to “3=very true or often true.” The German version of the PID5BF+M shows satisfactory reliability for all domain scores and a theoretically consistent structure of facet scores (see Bach et al., 2020).

Inventory of Personality Organization (IPO-16; Zimmermann et al., 2013)

The IPO-16 assesses impairments in personality organization (Kernberg & Caligor, 2005). The 16 items are rated on a 5-point Likert scale ranging from “1=never true” to “5=always true.” Personality dysfunction is measured across three content domains (identity diffusion, primitive defense, and lack of reality testing). The IPO-16 total score shows excellent internal consistency (Cronbach’s $\alpha=.91$) and excellent test-retest reliability of .85 over two months (Zimmermann et al., 2015).

Brief Inventory of Thriving (BIT; Su et al., 2014)

The BIT assesses health status of well-being (e.g., “I achieve most of my goals”). The ten items are rated on a 5-point Likert scale ranging from “1=I totally disagree” to “5=I totally agree.” The BIT total score shows an internal consistency (Cronbach’s α) of=.85 (Hausler et al., 2017).

Statistical analyses

The factor structure of the SIFS was investigated by testing a bifactor model with a general factor and two uncorrelated specific factors (self- and interpersonal; model 1), which would correspond to the structure of the LPFS-BF 2.0, and a bifactor model with a general factor and four uncorrelated specific factors (ID, SD, EM, INT; model 2). Therefore, a g-factor was set to explain covariances across all items, and specific factors were set orthogonally to explain shared variance among item clusters. Note that these models are less restrictive than many other confirmatory models (including correlated factor and hierarchical factor models with up to four factors), which is why, in the case of an insufficient fit, these more restrictive models would also appear implausible. Because reverse-keyed items could affect the factor structure, we explored models 1 and 2 with a method factor for reverse-keyed items (models 3 and 4, respectively), assuming that this might increase the fit indices. If the German version of the SIFS is able to capture the four specific domains,

models 2 or 4 should show good fit indices and a consistent loading pattern.

We used maximum likelihood estimation with robust standard errors and a Satorra-Bentler scaled test statistic (Satorra & Bentler, 2001). According to Rhemtulla et al. (2012) scales with five or more answer categories and approximately symmetric category thresholds can be treated as continuous. Nevertheless, robust fit indices are recommended to avoid biases due to non-zero skewness and kurtosis of item distributions (Brosseau-Liard et al., 2012; Brosseau-Liard & Savalei, 2014). Regarding confirmatory factor analysis (CFA), good model fit was assumed when the Root Mean Square Error of Approximation (RMSEA) was close to or below .06, the Standardized Root Mean Square Residual (SRMR) close to or below .08 and the Tucker-Lewis Index (TLI) as well as the Comparative Fit Index (CFI) were close to or above .95 (Hu & Bentler, 1999). Furthermore, we calculated the explained common variance (ECV), an index that can be interpreted as the proportion of common variance due to the g-factor. $ECV > .60$ indicates essential unidimensionality (Reise et al., 2013). Additionally, we also calculated ECV with respect to the specific factors.

To assess the internal consistency of the SIFS sum score, we used model-based Omega total (ω) and Omega Hierarchical (ω_H , Brunner et al., 2012); a $\omega_H > .70$ indicates unidimensionality (Reise et al., 2013). Additionally, we calculated ω_s and ω_{HS} to assess the internal consistency of the specific SIFS domains; a $\omega_{HS} > .50$ indicates the reliability of specific personality functioning factors (Reise et al., 2013). To calculate test-retest reliability after an interval of two weeks, we used bivariate zero-order correlations.

To investigate convergent validity, correlations between personality functioning measured with the SIFS and other self-report questionnaires of personality functioning (LPFS-BF 2.0), personality organization (IPO-16), pathological personality trait domains (PID5BF+M), and well-being (BIT) in the Clickworker sample as well as the self-report questionnaire for assessing personality functioning (LPFS-SR) in the German clinical sample were computed. For convergent validity analyses with interview-based assessments of personality functioning, correlations between the SIFS scales and the twelve subdomains, as well as the four domains of the LPFS (assessed with SCID-5-AMPD-I in the German clinical sample and with the STiP-5.1 in the Basel sample), were calculated. We further assessed convergent validity with the DSM-5 Section II PD model by correlating the SIFS scales with the ten specific PDs (dimensionally operationalized as the number of fulfilled criteria; see SCID-5-PD in the German clinical sample). According to Cohen (1992), we interpreted the size of correlation coefficients as follows: small correlations ($= .10$), medium correlations ($= .30$), and large correlations ($= .50$). For comparing the correlations between SIFS domain scores and external measures with each other we used Zou's confidence intervals (CIs) for dependent correlations (Zou, 2007). Following this approach, we reported correlation difference confidence intervals that did not include zero as significant.

The Basel and the Clickworker sample did not include participants with missing values. In the German clinical sample, missing values were as follows: $n_{SCID-5-AMPD} = 26$;

$n_{SCID-5-PD} = 8$, $n_{LPFS-SR} = 7$. All the correlations were estimated with pairwise deletion. In line with West et al. (1995), we verified that the SIFS items were sufficiently normally distributed with a skewness < 2 and kurtosis < 7 . For all the analyses we used the statistical software R version 4.1.0 (R Core Team, 2021) and the R packages psych (Revelle, 2020), lavaan (Rosseel et al., 2019), and tidyverse (Wickham & Wickham, 2017).

Results

SIFS, STiP-5.1, and SCID-5-AMPD-I domain and sum scores across the different samples can be found in Table 1. Personality functioning severity levels differed significantly, with the Basel clinical sample being the most impaired, followed by the German clinical sample, the Clickworker sample, and the Basel non-clinical sample. Thus, the combined sample covered the full spectrum of personality functioning.

Structure

The bifactor models did not fit the data well for the 24-item version of the SIFS (see Table 2). Note that this was also true for further CFA models following Gamache et al. (2019; see Supplementary Table 4). In addition, reversed item 6 and (non-reversed) item 10 consistently showed very low factor loading ($< .3$) in model 2. Items 6 and 10 were therefore excluded in the following analyses.

Estimating the bifactor models without items 6 and 10 increased the fit indices of all estimated models. Out of the two models, the bifactor model with two specific uncorrelated factors (model 1) showed the best, but still not good fit indices. Actually, the model achieved only good fit according to the cutoff for SRMR, while the remaining three fit indices were clearly not good (see Table 2). In addition, the loading pattern of the items was very heterogeneous: Reversed items 8, 19, and 24 showed very low factor

Table 1. Mean values of SIFS and interview-assessed personality functioning across the different samples.

Assessments	Samples			
	Basel clinical (<i>n</i> = 87)	Basel non-clinical (<i>n</i> = 29)	German clinical (<i>n</i> = 137*)	Click-worker (<i>n</i> = 633)
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
SIFS				
Sum	1.99 (0.6)	0.72 (0.3)	1.87 (0.6)	1.38 (0.6)
Identity	2.55 (0.8)	0.63 (0.5)	2.14 (0.9)	1.15 (0.8)
Self-direction	2.13 (0.7)	0.88 (0.6)	2.64 (0.8)	1.31 (0.7)
Empathy	1.14 (0.7)	0.44 (0.4)	1.21 (0.6)	1.04 (0.7)
Intimacy	1.55 (0.8)	0.48 (0.3)	1.75 (0.7)	1.37 (0.8)
Interviews				
Sum	2.10 (0.6)	0.36 (0.3)	1.49 (0.9)	–
Identity	2.43 (0.6)	0.50 (0.4)	1.80 (1.1)	–
Self-direction	2.16 (0.7)	0.23 (0.3)	1.62 (0.9)	–
Empathy	1.84 (0.7)	0.41 (0.4)	1.13 (1.0)	–
Intimacy	1.96 (0.7)	0.29 (0.4)	1.41 (1.0)	–

SIFS: Self and Interpersonal Functioning Scale; Interview for the Basel clinical and non-clinical sample: Semi-Structured Interview for Personality Functioning DSM-5; Interview for the German clinical sample: Structured Clinical Interview for the Alternative DSM-5 Model for Personality Disorders–Module I.

Notes. **n* = 111 for the SCID-5-AMPD-I of the German clinical sample.

Table 2. Test statistic and fit indices of CFA of the 24-item, 22-item (without items 6 and 10), and method factor for reversed items version of the SIFS.

Model	χ^2 (df)	CFI	TLI	RMSEA	SRMR
24-Item version					
1	1271.804 (228)	.857	.827	.079	.080
2	1459.368 (228)	.832	.796	.085	.081
22-Item version (without item 6 and 10)					
1	1065.231 (187)	.873	.843	.081	.073
2	1250.626 (187)	.847	.811	.088	.080
22-Item version (without item 6 and 10) and a method factor for reversed items					
3	860.109 (181)	.903	.876	.072	.063
4	1007.845 (181)	.882	.850	.079	.075

CFI: comparative fit index; RMSEA: root mean square error of approximation; SRMR: standardized root mean residual; TLI: Tucker-Lewis Index. Model 1: a bifactor model with two uncorrelated specific factors (representing self- and interpersonal functioning). Model 2: a bifactor model with four uncorrelated specific factors (representing identity, self-direction, empathy, and intimacy). Model 3: a bifactor model with two uncorrelated factors, with the items loading on the two specific factors (self and interpersonal) and on a general personality pathology factor including a method factor for reversed items. Model 4: a bifactor model with four uncorrelated specific factors (ID, SD, EM, INT), with items loading on the four specific factors and a general personality pathology factor including a method factor for reversed items. Notes. $N=886$. All values are according to the robust indices. All p -values $<.000$.

loadings ($<.3$) on the g-factor while for the specific factor interpersonal functioning, items 18 and 21 showed negative factor loadings. In contrast, the bifactor model with four specific uncorrelated factors (model 2) showed a more homogenous loading pattern for the g-factor, with an ECV of the g-factor (59.6%) and the reliability of the sum score ($\omega=.92, \omega_H=.81$) being higher than for model 1 (ECV = 52.9%, $\omega=.92, \omega_H=.68$). Following these findings, model 2 might be preferred despite its worse fit. Item loadings of this model solution are presented in Figure 1. In this model, the internal consistency for the four domains was poor for ω_{HS} (ID $\omega_s=.88, \omega_{HS}=.31$; SD $\omega_s=.73, \omega_{HS}=.22$; EM $\omega_s=.79, \omega_{HS}=.25$; and INT $\omega_s=.81, \omega_{HS}=.32$). The specific-factor ECV was 12.8% for ID, 6.4% for SD, 8.0% for EM and 13.2% for INT. Factor loadings on the g-factor and specific factors were all positive, but some reversed items (8, 17, 19, 24) and item 16 showed factor loadings $<.40$ on the g-factor, and item 21 showed a negative factor loading on the specific factor INT. Estimating the CFA models with a method factor for reversed items increased fit indices (see Table 2), but did not improve the loading pattern.

Test-retest reliability

For the SIFS sum score (22 items) the Pearson correlation for test-retest after two weeks ($n=157$) was $r=.86$ (95% CI [.81, .89]). At the level of domains, test-retest correlation was $r=.85$ (95% CI [.80, .89]) for ID, $r=.72$ (95% CI [.64, .79]) for SD, $r=.77$ (95% CI [.69, .83]) for EM, and $r=.78$ (95% CI [.71, .84]) for INT. All correlations were statistically significant ($p<.001$).

Convergent validity

Correlations for convergent validity analyses can be found in Table 3. In the Clickworker sample ($n=633$), correlations

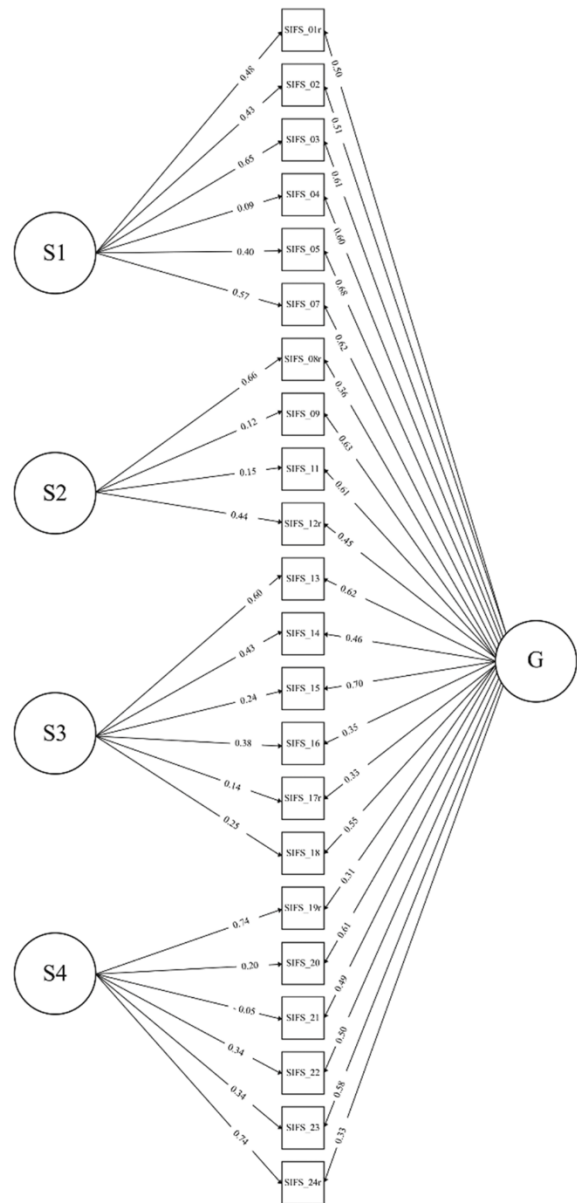


Figure 1. Standardized factor loadings of confirmatory factor analysis of the 22-item version of the SIFS: Bifactor model with four specific uncorrelated factors. Notes. $N=886$. G: general factor (personality functioning); S1: specific factor 1 (identity); S2: specific factor 2 (self-direction); S3: specific factor 3 (empathy); S4: specific factor 4 (intimacy); SIFS: Self and Interpersonal Functioning Scale, representing the four domains of the Level of Personality Functioning Scale.

between the SIFS sum score (22-item version) and the associated measures were large, including LPFS-BF 2.0 ($r=.82, p<.001$) and IPO-16 ($r=.76, p<.001$). Additionally, the correlations of the SIFS sum score with the pathological personality trait domain scores were large (ranging from .50 to .73, $p<.001$), with the exception of PID5BF+M anankastia ($r=.38, p<.001$). The correlation between the SIFS sum score and the well-being construct was largely negative

Table 3. Correlations between SIFS scales (22-item version without items 6 and 10) and LPFS-BF 2.0, IPO-16, PID5BF+M, BIT subscale scores ($n=633$); LPFS-SR ($n=130$); interview-based LPFS scores according to STiP-5.1 and SCID-5-AMPD-I ($n=253$); and SCID-5-PD ($n=129$).

Assessments	SIFS				
	ID	SD	EM	INT	Sum
Self-report questionnaires					
LPFS-SR sum	.74	.69	.61	.66	.87
LPFS-SR ID	.78	.70	.52	.55	.82
LPFS-SR SD	.68	.66	.51	.52	.76
LPFS-SR EM	.55	.55	.76	.57	.76
LPFS-SR INT	.56	.50	.49	.71	.73
LPFS-BF 2.0 sum	.82	.64	.62	.63	.82
LPFS-BF 2.0 self	.84	.64	.50	.51	.75
LPFS-BF 2.0 interpersonal	.63	.52	.66	.65	.75
IPO-16 sum	.70	.61	.67	.52	.76
PID-5 Neg. affectivity	.67	.47	.36	.37	.57
PID-5 detachment	.58	.50	.59	.72	.73
PID-5 antagonism	.34	.40	.54	.39	.50
PID-5 disinhibition	.57	.63	.52	.41	.63
PID-5 psychoticism	.56	.47	.57	.46	.63
PID-5 anankastia	.33	.18	.35	.34	.38
BIT sum	-.67	-.57	-.40	-.58	-.67
Interview-based LPFS (SCID-5-AMPD-I and STiP-5.1)					
Global score	.69	.62	.55	.63	.76
Self-domain	.72	.65	.50	.58	.75
Identity	.75	.62	.52	.60	.76
Sense of self	.68	.54	.44	.54	.67
Self-esteem	.68	.58	.52	.51	.72
Emotions	.55	.55	.32	.57	.57
Self-direction	.65	.62	.45	.52	.68
Goals	.55	.55	.32	.43	.57
Standards	.60	.56	.43	.46	.63
Self-reflection	.59	.56	.45	.50	.64
Interpersonal domain	.60	.55	.57	.63	.71
Empathy	.55	.52	.57	.55	.66
Comprehension	.56	.49	.49	.53	.63
Tolerance	.41	.40	.54	.48	.55
Effects	.50	.50	.52	.48	.60
Intimacy	.59	.53	.51	.65	.70
Connection	.50	.43	.44	.57	.59
Closeness	.61	.48	.46	.60	.67
Mutuality	.47	.48	.46	.56	.59
SCID-5-PD					
ASPD	.22	.24	.47	.32	.39
AVPD	.53	.44	.23	.39	.52
BPD	.67	.54	.36	.37	.63
DPD	.48	.43	.18	.23	.43
HPD	.29	.28	.37	.27	.39
NPD	.25	.23	.52	.29	.40
OCPD	.16	-.01	.17	.13	.15
PPD	.38	.36	.50	.44	.53
SIPD	.19	.22	.39	.35	.36
STPD	.31	.35	.51	.45	.51

SIFS: Self- and Interpersonal Functioning Scale; ID: identity; SD: self-direction; EM: empathy; INT: intimacy; LPFS-BF 2.0: Level of Personality Functioning Scale–Brief Form 2.0; LPFS-SR: Level of Personality Functioning–Self Report; IPO-16: Inventory of Personality Organization–16 item version; PID-5BF + M: Personality Inventory for DSM-5 Brief Form–Modified; BIT: Brief Inventory of Thriving; STiP-5.1: Semi-Structured Interview for Personality Functioning DSM-5; SCID-5-AMPD-I: Structured Clinical Interview for the Alternative DSM-5 Model for Personality Disorders–Module I; SCID-5-PD: Structured Clinical Interview for DSM-5 Personality Disorders (PD); AVPD: avoidant PD; DPD: dependent PD; OCPD: obsessive-compulsive PD; PPD: paranoid PD; STPD: schizotypal PD; SIPD: schizoid PD; HPD: histrionic PD; NPD: narcissistic PD; BPD: borderline PD; ASPD: antisocial PD.

Notes. Statistically significant p -values $<.001$ are marked in bold.

($r=-0.67$, $p<.001$). The correlation matrix for the convergent validity analyses (conducted with the 22-item version of the SIFS) in the Clickworker sample can be found in Table 3.

To calculate the correlation between the SIFS sum score and the dimensional interviews (STiP-5.1 and SCID-5-AMPD-I), we merged the two interview-samples (in detail, 116 STiP-5.1 and 111 SCID-5-AMPD-I interviews) because both included the same twelve LPFS subdomain ratings. Overall ($n=227$), the SIFS sum score correlated strongly with all four interview-based LPFS domains (between .66 and .76, $p<.001$), correlating largest with the ID domain ($r=.76$, $p<.001$). The correlation matrix of all the

interview-based LPFS ratings (with the 22-item version of the SIFS) can be found in Table 3. Separate correlations of the SIFS with the STiP-5.1 and SCID-5-AMPD-I show no substantial differences (SIFS sum and STiP-5.1 total = .78; SIFS sum and SCID-5-AMPD-I total = .74) and can be found in Supplementary Tables 2 and 3, respectively.

Correlations between the SIFS sum score and DSM-5 Section II PDs (according to SCID-5-PD) were small to medium, with the exception of borderline (BPD, $r=.63$, $p<.001$), paranoid ($r=.53$, $p<.001$), avoidant ($r=.52$, $p<.001$) and schizotypal ($r=.51$, $p<.001$) PD. The smallest correlation was between the SIFS sum score and obsessive-compulsive

PD (OCPD, $r=.15$, $p=.08$). All correlations with OCPD were not significant.

Regarding the four domains of the SIFS, our data showed that the ID domain correlated (compared with the other three domains) more strongly with the sum score of LPFS-BF 2.0 ($r=.82$, $p<.001$) and the BIT ($r=-0.67$, $p<.001$). The SIFS ID domain correlated also significantly more strongly with the corresponding domain in the AMPD interview (STiP-5.1 and SCID-5-AMPD-I merged; $r=.75$, $p<.001$). Regarding the correlations of the four SIFS domain scores and Criterion B, ID correlated significantly more strongly with negative affectivity ($r=.70$, $p<.001$); SD with disinhibition ($r=.56$, $p<.001$); and INT with detachment ($r=.72$, $p<.001$). The correlations between the SIFS domains and DSM-5 Section II PDs showed that the ID domain correlated more strongly with BPD ($r=.67$, $p<.001$). The remaining differences between the correlations of the SIFS domain scores with external measures were not significant according to Zou (2007). For more details on convergent validity for the 22-item version of the SIFS, see Table 3.

Discussion

This study reports the psychometric properties of the German translation of the SIFS for assessing the level of personality functioning according to Criterion A of the AMPD. In line with Gamache et al. (2019), the German SIFS sum score showed promising results regarding test-retest reliability and convergent validity with self-report questionnaires. Additionally, for the first time, this study showed large correlations between the SIFS sum score and the scores of interview-based measures of personality functioning. However, the psychometric structure of the SIFS appears to be rather complex and not in line with theoretical considerations.

In particular, we were not able to establish an appropriate bifactor model for the German 24-item version of the SIFS. This is in contrast to other Criterion A measures (e.g., LPFS-SR, LPFS-BF), which have been shown to conform to a bifactor structure in which a strong g-factor explains the majority of variance and specific factors represent only little to no variance, consistent with the notion that personality functioning is an essentially unidimensional construct (Bliton et al., 2022). In our results, a bifactor model with four uncorrelated specific factors (model 2) indicated less than acceptable fit and included two SIFS items with questionably low factor loadings. These items were the reversed item 6 (“I recognize myself in the way other people describe me”) and the rather complicated-worded item 10 (“My actions and decisions are determined by my immediate needs, independently of everything else”). Interestingly, item 6 had already shown problematic psychometric properties in the French version but was still retained (Gamache et al., 2019). An iteration of the CFA models excluding items 6 and 10, a bifactor model with two or four uncorrelated, specific factors (model 1 and 2), also did not show good fit but could perhaps still be interpreted as close to acceptable. Note that, besides model fit, a well-established bifactor model should

also consist of substantial loadings on the g-factor, adequate reliability (i.e., ω , ω_H), as well as reasonable ECV (Watts et al., 2019). In comparison to other Criterion A instruments (e.g., Morey, 2017; Weekers et al., 2019), the ECV of the g-factor and ω_H were at least acceptable for the 22-item version when adopting model 2, suggesting that the 22-item SIFS may measure a sufficient amount of general personality functioning variance. The problem with the bifactor model, however, is most evident in the loading pattern. There are significant variations in the standardized loadings on the g-factor in model 2, i.e., five items loaded $<.40$ on the g-factor, some loadings on the specific factors were very small ($<.3$) and item 21 showed a negative loading. Moreover, the poor ω_{HS} for the specific factors confirm the low reliable variance beyond the g-factor. Therefore, we do not recommend the 22-item SIFS for the investigation of specific personality functioning domains, but to use the sum score for a global impression of personality functioning (see implications regarding the scoring system in Supplementary Table 1).

One reason for the unsatisfying psychometric properties may be the inclusion of reversed items within the SIFS. Consequently, there is a risk of reduced reliability when non-reversed and reversed items are included in the same test, as the secondary sources of variance may compromise the unidimensionality of the test (e.g., due to careless responding; Woods, 2006). In line with this, Leclerc et al. (2022) developed a revised version of the original SIFS with 20-items and excluded items with reversed wordings. However, combining non-reversed and reversed items in a test may safeguard against other types of response bias (e.g., acquiescence) and improve the coverage of the domains' content. We addressed the complexities of reversed items by including a method factor in the CFA models. While adding this method factor increased the model fit, the ECV, internal consistency, and factor loadings were unchanged, indicating that besides the reversed items, the German version of the SIFS shows problematic wording compromising its psychometric properties. These mentioned problems do not seem to be unique to the German version but represent fundamental problems of the instrument itself, implying that there are some unresolved issues with the original version of the SIFS.

Although some of the SIFS items showed low factor loadings in the bifactor model (see Figure 1), correlations of the sum score with other self-report questionnaires on Criterion A and the psychodynamic construct of personality organization were still large. This could indicate large convergent validity, but may also result from shared unspecified variance, including momentary distress or common method bias (Podsakoff et al., 2003). Thus, an important strength of this study was demonstrating that the convergent validity of the SIFS sum score was also large when using two (semi-)structured Criterion A interviews, thereby ruling out common method bias. These results are in line with recent studies, which have shown that self-rated and interview-assessed personality functioning can be strongly correlated (e.g., Heissler et al., 2021; Ohse et al., 2023; Somma et al., 2020). Additionally, our results showed some significantly stronger

correlations between the SIFS ID domain external criteria. These results may suggest that self-reported identity disturbances are a particularly strong marker of impaired functioning (e.g., LPFS-BF2.0 sum score). On the other hand, the SIFS ID domain also correlated more strongly (compared to the other three domains) with negative affectivity, suggesting that the ID domain may lack discriminant validity with regard to trait models of personality and personality pathology (Oltmanns & Widiger, 2016). Nevertheless, convergent validity of the specific SIFS domains did not show distinct patterns of correlations with the corresponding external criteria, as we had originally assumed. This substantiates the conclusion that the use of domain scores does not provide much additional benefit.

In line with previous SIFS studies concerning the convergent validity with Criterion B constructs, the SIFS sum score showed large correlations with all pathological personality trait domains (e.g., Gamache et al., 2019; Waugh et al., 2021), except for the additional ICD-11 trait domain anankastia. This is in line with previous studies (McCabe & Widiger, 2020; Zimmermann, Falk, et al., 2023) showing a weak relationship between measures of anankastia and Criterion A. We argue that the relationship between Criterion A and anankastia may be complex, because the construct of anankastia may have adaptive facets that are not necessarily dysfunctional (e.g., deliberativeness) or measures of anankastia may be formulated too adaptively and therefore do not represent the actually maladaptive character of anankastia (Zimmermann, Falk, et al., 2023). Regarding DSM-5 Section II PDs, BPD showed the largest correlations with SIFS sum score across all PD categories, supporting the hypothesis that BPD is a particularly strong marker of general impairments of personality pathology (Sharp et al., 2015). Considering the remaining PD categories, we found that OCPD was almost uncorrelated with the SIFS scores, which parallels the rather small correlations with the phenotypic expression of anankastia (ICD-11 trait). Moreover, the large negative correlation between the SIFS sum and the construct of well-being can be reconciled with the results of low life satisfaction found by Gamache et al. (2019).

Comparing the SIFS with existing self-report measures of Criterion A (e.g., LPFS-SR, LPFS-SRA, LPFS-BF 2.0, DLOPFQ, and DLOPFQ-SF), our study revealed no advantages with respect to its psychometric structural properties. Just as the LPFS-BF (Hutsebaut et al., 2016) was revised (LPFS-BF 2.0) due to its low internal consistency (three items were problematic and therefore reformulated), our study advocates a fundamental revision of the problematic SIFS items (in terms of wording and item reversion) and a careful psychometric evaluation in a multi-method design.

Limitations

The present study has several limitations. First, we translated the SIFS into German according to a standardized back-translation process using an English version provided by Dominique Gamache with two independent bilingual and

single-blinded translators. However, the validation of the original SIFS by Gamache et al. (2019) is based on the French version. Nevertheless, we double-checked the German version with the French version and found no significant discrepancies. Second, the Clickworker sample lacked an interview for clinical assessment; therefore, it cannot be ensured that this sample is entirely nonclinical. Moreover, we did not assess clinical diagnoses (other than PDs) for the clinical samples and the NC data (Clickworker and Basel NCs) were not representative of the general population. Third, the German clinical and the Basel sample did not include a careless responding variable in the self-report battery. Fourth, at the Basel study site, we did not investigate the inter-rater reliability between the STiP-5.1 interviewers, however, all interviewers were experienced clinicians trained in dimensionally assessing personality dysfunction with axis IV of the OPD-2. Fifth, we assessed only a small subsample ($n=157$) for test-retest analyses. Sixth, we did not investigate the discriminant validity of the SIFS sum score. However, because most clinical constructs will be positively correlated with Criterion A, investigating discriminant validity seems challenging (Zimmermann, Hopwood, et al., 2023). Seventh, our results suggest modifications to the item content itself. These are currently taken into account in the development of an adapted version of the SIFS, which was not yet available during our data collection.

Conclusion

The present validation study examined the structure, reliability, and convergent validity of the SIFS. Following our analyses, a bifactor model with one general and four specific uncorrelated factors (ID, SD, EM, INT) seemed most suitable for a shortened 22-item version (without items 6 and 10) of the SIFS, with the g-factor explaining 59.6% of the common variance and showing the reliability of .81. However, fit indices were not fully acceptable and the items' loadings on the g-factor differed considerably, suggesting that several (especially reverse-coded) items cannot be easily integrated into a reliable assessment of personality functioning with the German version of the SIFS. Moreover, factor loadings and explained variance of specific factors were rather small, questioning the utility of domain scores beyond the sum score. Nevertheless, test-retest reliability and convergent validity with other well-established self-reports for Criterion A and personality organization were large for the sum score of the SIFS. In addition, our results show that the SIFS sum score has large convergence with two (semi-)structured interviews measuring Criterion A. Taken together, our study on the psychometric investigation of the German SIFS shows mixed results, and warrants modifications for the use in research (i.e., regarding problematically worded or reversed items), confirming the results found by Leclerc et al. (2022). While in the clinical context, the current 22-item German version may serve as a brief measure for the general severity of PD, it seems currently more advisable to use self-report questionnaires with higher structural validity such as the LPFS-BF 2.0.

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Ethical approval

The Northwestern and Central Swiss Ethics Committee and the Ethics Committee of the Psychologische Hochschule Berlin approved this study independently for the respective study sites.








Disclosure statement

The authors declare there are no conflicts of interest.

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Data availability statement

The data of this study are available from the first author, upon reasonable request.

References

- American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Author.
- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Author.
- Angehrn, A., Jourdan-Ionescu, C., & Gamache, D. (2023). Resilience among police officers: The role of personality functioning and protective factors. *Policing: An International Journal*, 46(3), 567–582. <https://doi.org/10.1108/PIJPSM-02-2023-0025>
- Arslan, R. C., Walther, M. P., & Tata, C. S. (2020). formr: A study framework allowing for automated feedback generation and complex longitudinal experience-sampling studies using R. *Behavior Research Methods*, 52(1), 376–387. <https://doi.org/10.3758/s13428-019-01236-y>
- Bach, B., Kerber, A., Aluja, A., Bastiaens, T., Keeley, J., Claes, L., Fossati, A., Gutierrez, F., Oliveira, S. E. S., Pires, R., Riegel, K. D., Rolland, J., Roskam, I., Sellbom, M., Somma, A., Spanemberg, L., Strus, W., Thimm, J., Wright, A. G. C., & Zimmermann, J. (2020). International assessment of DSM-5 and ICD-11 personality disorder traits: Toward a common nosology in DSM-5.1. *Psychopathology*, 53(3–4), 179–188. <https://doi.org/10.1159/000507589>
- Beesdo-Baum, K., Zaudig, M., & Wittchen, H. U. (2019a). *SCID-5-PD. Strukturiertes Klinisches Interview für DSM-5®-Persönlichkeitsstörungen. Deutsche Bearbeitung des [Structured Clinical Interview for DSM-5®-Personality Disorders von Michael B. First, Janet BW Williams, Lorna Smith Benjamin, Robert L. Spitzer]. Hogrefe.*
- Beesdo-Baum, K., Zaudig, M., & Wittchen, H. U. (Eds.). (2019b). *SCID-5-CV Strukturiertes Klinisches Interview für DSM-5-Störungen-Klinische Version: Deutsche Bearbeitung des [Structured Clinical Interview for DSM-5 Disorders-Clinician Version von Michael B. First, Janet BW Williams, Rhonda S. Karg, Robert L. Spitzer]. Hogrefe.*
- Bender, D. S., Morey, L. C., & Skodol, A. E. (2011). Toward a model for assessing level of personality functioning in DSM-5, part I: A review of theory and methods. *Journal of Personality Assessment*, 93(4), 332–346. <https://doi.org/10.1080/00223891.2011.583808>
- Bender, D., Skodol, A., First, M., & Oldham, J. (2018). *Module I: Structured Clinical Interview for the Level of Personality Functioning Scale*. American Psychiatric Association.
- Birkhölzer, M., Schmeck, K., & Goth, K. (2021). Assessment of Criterion A. *Current Opinion in Psychology*, 37, 98–103. <https://doi.org/10.1016/j.copsyc.2020.09.009>
- Bliton, C. F., Roche, M. J., Pincus, A. L., & Dueber, D. (2022). Examining the structure and validity of self-report measures of DSM-5 alternative model for personality disorders Criterion A. *Journal of Personality Disorders*, 36(2), 157–182. https://doi.org/10.1521/pedi_2021_35_531
- Brosseau-Liard, P. E., & Savalei, V. (2014). Adjusting incremental fit indices for nonnormality. *Multivariate Behavioral Research*, 49(5), 460–470. <https://doi.org/10.1080/00273171.2014.933697>
- Brosseau-Liard, P. E., Savalei, V., & Li, L. (2012). An investigation of the sample performance of two nonnormality corrections for RMSEA. *Multivariate Behavioral Research*, 47(6), 904–930. <https://doi.org/10.1080/00273171.2012.715252>
- Brunner, M., Nagy, G., & Wilhelm, O. (2012). A tutorial on hierarchically structured constructs. *Journal of Personality*, 80(4), 796–846. <https://doi.org/10.1111/j.1467-6494.2011.00749x>
- Clark, L. A. (2007). Assessment and diagnosis of personality disorder: Perennial issues and an emerging reconceptualization. *Annual Review of Psychology*, 58(1), 227–257. <https://doi.org/10.1146/annurev.psych.57.102904.190200>
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112(1), 155–159. <https://doi.org/10.1037//0033-2909.112.1.155>
- Gamache, D., Cloutier, M. È., Faucher, J., Leclerc, P., & Savard, C. (2023). Stalking perpetration through the lens of the alternative DSM-5 model for personality disorders. *Personality and Mental Health*, 17(2), 135–146. <https://doi.org/10.1002/pmh.1567>
- Gamache, D., Savard, C., Leclerc, P., & Côté, A. (2019). Introducing a short self-report for the assessment of DSM-5 level of personality functioning for personality disorders: The Self and Interpersonal Functioning Scale. *Personality Disorders*, 10(5), 438–447. <https://doi.org/10.1037/per0000335>
- Gamache, D., Savard, C., Leclerc, P., Payant, M., Berthelot, N., Côté, A., Faucher, J., Lampron, M., Lemieux, R., Mayrand, K., Nolin, M.-C., & Tremblay, M. (2021). A proposed classification of ICD-11 severity degrees of personality pathology using the Self and Interpersonal Functioning Scale. *Frontiers in Psychiatry*, 12, 628057. <https://doi.org/10.3389/fpsy.2021.628057>
- Gamache, D., Savard, C., Leclerc, P., Payant, M., Côté, A., Faucher, J., Lampron, M., & Tremblay, M. (2021). Latent profiles of patients with borderline pathology based on the alternative DSM-5 model for personality disorders. *Borderline Personality Disorder and Emotion Dysregulation*, 8(1), 1–13. <https://doi.org/10.1186/s40479-021-00146-w>
- Gamache, R., Savard, C., Lemieux, R., & Berthelot, N. (2022). Impact of level of personality pathology on affective, behavioral, and thought problems in pregnant women during the coronavirus disease 2019 pandemic. *Personality Disorders*, 13(1), 41–51. <https://doi.org/10.1037/per0000479>
- Hausler, M., Huber, A., Strecker, C., Brenner, M., Höge, T., & Höfer, S. (2017). Validierung eines Fragebogens zur umfassenden Operationalisierung von Wohlbefinden. *Diagnostica*, 63(3), 219–228. <https://doi.org/10.1026/0012-1924/a000174>
- Heissler, R., Doubková, N., Hutsebaut, J., & Preiss, M. (2021). Semi-structured Interview for Personality Functioning DSM-5 (STIP-5.1): Psychometric evaluation of the Czech version. *Personality and Mental Health*, 15(3), 198–207. <https://doi.org/10.1002/pmh.1508>
- Hopwood, C. J., Good, E. W., & Morey, L. C. (2018). Validity of the DSM-5 levels of personality functioning scale–Self report. *Journal of*

- Personality Assessment*, 100(6), 650–659. <https://doi.org/10.1080/00223891.2017.1420660>
- Hörz-Sagstetter, S., Mokros, A., & Zimmermann, J. (in press). *Strukturiertes Klinisches Interview für das DSM-5 – Alternatives Modell für Persönlichkeitsstörungen (SCID-5-AMPD)* [German adaptation of the Structured Clinical Interview for the DSM-5 – Alternative Model for Personality Disorders by Michael B. First, Andrew E. Skodol, Donna S. Bender, and John M. Oldham]. Hogrefe.
- Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Huprich, S. K., Nelson, S. M., Meehan, K. B., Siefert, C. J., Haggerty, G., Sexton, J., Dauphin, V. B., Macaluso, M., Jackson, J., Zackula, R., & Baade, L. (2018). Introduction of the DSM-5 levels of Personality Functioning Questionnaire. *Personality Disorders*, 9(6), 553–563. <https://doi.org/10.1037/per0000264>
- Hutsebaut, J., Feenstra, D. J., & Kamphuis, J. H. (2016). Development and preliminary psychometric evaluation of a brief self-report questionnaire for the assessment of the DSM-5 level of Personality Functioning Scale: The LPFS brief form (LPFS-BF). *Personality Disorders*, 7(2), 192–197. <https://doi.org/10.1037/per0000159>
- Hutsebaut, J., Kamphuis, J. H., Feenstra, D. J., Weekers, L. C., & De Saeger, H. (2017). Assessing DSM-5-oriented level of personality functioning: Development and psychometric evaluation of the Semi-Structured Interview for Personality Functioning DSM-5 (STiP-5.1). *Personality Disorders*, 8(1), 94–101. <https://doi.org/10.1037/per0000197>
- Kerber, A., Schultze, M., Müller, S., Rühling, R. M., Wright, A. G., Spitzer, C., Krueger, R. F., Knaevelsrud, C., & Zimmermann, J. (2022). Development of a short and ICD-11 compatible measure for DSM-5 maladaptive personality traits using ant colony optimization algorithms. *Assessment*, 29(3), 467–487. <https://doi.org/10.1177/1073191120971848>
- Kernberg, O. F., & Caligor, E. (2005). A psychoanalytic theory of personality disorders. In M. F. Lenzenweger & J. F. Clarkin (Eds.), *Major theories of personality disorder* (2nd ed., pp. 114–156). Guilford Press.
- Leclerc, P., Savard, C., Sellbom, M., Côté, A., Nolin, M.-C., Payant, M., Roy, D., & Gamache, D. (2023). Investigating the validity and measurement invariance of the Personality Inventory for DSM-5 Faceted Brief Form among French-speaking clinical and nonclinical samples. *Journal of Psychopathology and Behavioral Assessment*, 45(2), 519–536. <https://doi.org/10.1007/s10862-022-10000-0>
- Leclerc, P., Savard, C., Vachon, D. D., Faucher, J., Payant, M., Lampron, M., Tremblay, M., & Gamache, D. (2022). Analysis of the interaction between personality dysfunction and traits in the statistical prediction of physical aggression: Results from outpatient and community samples. *Personality and Mental Health*, 16(1), 5–18. <https://doi.org/10.1002/pmh.1522>
- Lobbestaal, J., Leurgans, M., & Arntz, A. (2011). Inter-rater reliability of the Structured Clinical Interview for DSM-IV axis I disorders (SCID I) and axis II disorders (SCID II). *Clinical Psychology & Psychotherapy*, 18(1), 75–79. <https://doi.org/10.1002/cpp.693>
- McCabe, G. A., & Widiger, T. A. (2020). A comprehensive comparison of the ICD-11 and DSM-5 section III personality disorder models. *Psychological Assessment*, 32(1), 72–84. <https://doi.org/10.1037/pas0000772>
- Morey, L. C. (2017). Development and initial evaluation of a self-report form of the DSM-5 Level of Personality Functioning Scale. *Psychological Assessment*, 29(10), 1302–1308. <https://doi.org/10.1037/pas0000450>
- Morey, L. C., Bender, D. S., & Skodol, A. E. (2013). Validating the proposed diagnostic and statistical manual of mental disorders, severity indicator for personality disorder. *The Journal of Nervous and Mental Disease*, 201(9), 729–735. <https://doi.org/10.1097/NMD.0b013e3182a20ea8>
- Morey, L. C., Benson, K. T., Busch, A. J., & Skodol, A. E. (2015). Personality disorders in DSM-5: Emerging research on the alternative model. *Current Psychiatry Reports*, 17(4), 24. <https://doi.org/10.1007/s11920-015-0558-0>
- Ohse, L., Zimmermann, J., Kerber, A., Kampe, L., Mohr, J., Kendlbacher, J., Busch, O., Rentrop, M., & Hörz-Sagstetter, S. (2023). Reliability, structure, and validity of module I (personality functioning) of the structured clinical interview for the alternative DSM-5 model for personality disorders (SCID-5-AMPD-1). *Personality Disorders: Theory, Research, and Treatment*, 14(3), 287–299. <https://doi.org/10.1037/per0000576>
- Oltmanns, J. R., & Widiger, T. A. (2016). Self-pathology, the five-factor model, and bloated specific factors: A cautionary tale. *Journal of Abnormal Psychology*, 125(3), 423–434. <https://doi.org/10.1037/abn0000144>
- OPD Task Force (2008). *Operationalized psychodynamic diagnosis OPD-2: Manual of diagnosis and treatment planning*. Hogrefe & Huber.
- Osório, F. L., Loureiro, S. R., Hallak, J. E. C., Machado-de-Sousa, J. P., Ushirohira, J. M., Baes, C. V. W., Apolinario, T. D., Donadon, M. F., Bolsoni, L. M., Guimarães, T., Fracon, V. S., Silva-Rodrigues, A. P. C., Pizeta, F. A., Souza, R. M., Sanches, R. F., Dos Santos, R. G., Martin-Santos, R., & Crippa, J. A. S. (2019). Clinical validity and intrarater and test-retest reliability of the structured clinical interview for DSM-5-clinician version (SCID-5-CV). *Psychiatry and Clinical Neuroscience*, 73(12), 754–760. <https://doi.org/10.1111/pcn.12931>
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *The Journal of Applied Psychology*, 88(5), 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>
- R Core Team (2021). *R: A language and environment for statistical computing [computer software]*. R Foundation for Statistical Computing. Retrieved from <https://www.R-project.org/>
- Reise, S. P., Scheines, R., Widaman, K. F., & Haviland, M. G. (2013). Multidimensionality and structural coefficient bias in structural equation modeling: A bifactor perspective. *Educational and Psychological Measurement*, 73(1), 5–26. <https://doi.org/10.1177/0013164412449831>
- Revelle, W. (2020). *Package 'psych': procedures for psychological, psychometric, and personality research*. R package version 2.1.3.
- Rhemtulla, M., Brosseau-Liard, P. É., & Savalei, V. (2012). When can categorical variables be treated as continuous? A comparison of robust continuous and categorical SEM estimation methods under suboptimal conditions. *Psychological Methods*, 17(3), 354–373. <https://doi.org/10.1037/a0029315>
- Roche, M. J., & Jaweed, S. (2023). Comparing measures of Criterion A to better understand incremental validity in the alternative model of personality disorders. *Assessment*, 30(3), 689–705. <https://doi.org/10.1177/10731911211059763>
- Roche, M. J., Jacobson, N. C., & Phillips, J. J. (2018). Expanding the validity of the Level of Personality Functioning Scale observer report and self-report versions across psychodynamic and interpersonal paradigms. *Journal of Personality Assessment*, 100(6), 571–580. <https://doi.org/10.1080/00223891.2018.1475394>
- Roche, M. J., Jacobson, N. C., & Pincus, A. L. (2016). Using repeated daily assessments to uncover oscillating patterns and temporally-dynamic triggers in structures of psychopathology: Applications to the DSM-5 alternative model of personality disorders. *Journal of Abnormal Psychology*, 125(8), 1090–1102. <https://doi.org/10.1037/abn0000177>
- Rosseel, Y. (2019). *Package 'lavaan'*. R package version 0.6–3. <https://cran.r-project.org/web/packages/lavaan/index.html>
- Samytkin, D. V., Demidova, L., Gadisov, T. G., Nikitsky, I. S., & Tkachenko, A. A. (2023). Предварительная адаптация и валидизация психометрических методов дляdimensionальной оценки расстройств личности в рамках перехода к МКБ-11. *Российский психиатрический журнал*, (1), 51–59.
- Satorra, A., & Bentler, P. M. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika*, 66(4), 507–514. <https://doi.org/10.1007/BF02296192>
- Sharp, C., & Wall, K. (2021). DSM-5 level of personality functioning: Refocusing personality disorder on what it means to be human. *Annual Review of Clinical Psychology*, 17(1), 313–337. <https://doi.org/10.1146/annurev-clinpsy-081219-105402>

- Sharp, C., Wright, A. G. C., Fowler, J. C., Frueh, B. C., Allen, J. G., Oldham, J., & Clark, L. A. (2015). The structure of personality pathology: Both general ('g') and specific ('s') factors? *Journal of Abnormal Psychology, 124*(2), 387–398. <https://doi.org/10.1037/abn0000033>
- Siefert, C. J., Sexton, J., Meehan, K., Nelson, S., Haggerty, G., Dauphin, B., & Huprich, S. (2020). Development of a short form for the DSM-5 levels of personality functioning questionnaire. *Journal of Personality Assessment, 102*(4), 516–526. <https://doi.org/10.1080/00223891.2019.1594842>
- Somma, A., Borroni, S., Gialdi, G., Carlotta, D., Emanuela Giaroli, L., Barranca, M., Cerioli, C., Franzoni, C., Masci, E., Manini, R., Luca Busso, S., Ruotolo, G., Krueger, R. F., Markon, K. E., & Fossati, A. (2020). The inter-rater reliability and validity of the Italian translation of the structured clinical interview for DSM-5 alternative model for personality disorders module i and module ii: A preliminary report on consecutively admitted psychotherapy outpatients. *Journal of Personality Disorders, 34*(Suppl C), 95–123. https://doi.org/10.1521/pedi_2020_34_511
- Spitzer, C., Müller, S., Kerber, A., Hutsebaut, J., Brähler, E., & Zimmermann, J. (2021). Die deutsche Version der Level of Personality Functioning Scale-Brief Form 2.0 (LPFS-BF): Faktorenstruktur, konvergente Validität und Normwerte in der Allgemeinbevölkerung. *PPmP: Psychotherapie, Psychosomatik, Medizinische Psychologie, 71*(07), 284–293. <https://doi.org/10.1055/a-1343-2396>
- Su, R., Tay, L., & Diener, E. (2014). The development and validation of Comprehensive Inventory of Thriving (CIT) and Brief Inventory of Thriving (BIT). *Applied Psychology: Health and Well-Being, 6*(3), 251–279. <https://doi.org/10.1111/aphw.12027>
- Tyrer, P., Reed, G. M., & Crawford, M. J. (2015). Classification, assessment, prevalence, and effect of personality disorder. *Lancet, 385*(9969), 717–726. [https://doi.org/10.1016/S0140-6736\(14\)61995-4](https://doi.org/10.1016/S0140-6736(14)61995-4)
- Watts, A. L., Poore, H. E., & Waldman, I. D. (2019). Riskier tests of the validity of the bifactor model of psychopathology. *Clinical Psychological Science, 7*(6), 1285–1303. <https://doi.org/10.1177/2167702619855035>
- Waugh, M. H., McClain, C. M., Mariotti, E. C., Mulay, A. L., DeVore, E. N., Lenger, K. A., Russell, A. N., Florimbio, A. R., Lewis, K. C., Ridenour, J. M., & Beevers, L. G. (2021). Comparative content analysis of self-report scales for level of personality functioning. *Journal of Personality Assessment, 103*(2), 161–173. <https://doi.org/10.1080/00223891.2019.1705464>
- Weekers, L. C., Hutsebaut, J., & Kamphuis, J. H. (2019). The Level of Personality Functioning Scale-Brief Form 2.0: Update of a brief instrument for assessing level of personality functioning. *Personality and Mental Health, 13*(1), 3–14. <https://doi.org/10.1002/pmh.1434>
- West, S. G., Finch, J. F., & Curran, P. J. (1995). Structural equation models with nonnormal variables: problems and remedies. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 56–75). Sage Publications, Inc.
- Wickham, H., & Wickham, M. H. (2017). Package tidyverse. Tidyverse.
- Widiger, T. A., & Hines, A. (2022). The diagnostic and statistical manual of mental disorders, fifth edition alternative model of personality disorder. *Personality Disorders, 13*(4), 347–355. <https://doi.org/10.1037/per0000524>
- Widiger, T. A., & Trull, T. J. (2007). Plate tectonics in the classification of personality disorder: Shifting to a dimensional model. *The American Psychologist, 62*(2), 71–83. <https://doi.org/10.1037/0003-066x.62.2.71>
- Woods, C. M. (2006). Careless responding to reverse-worded items: Implications for confirmatory factor analysis. *Journal of Psychopathology and Behavioral Assessment, 28*(3), 186–191. <https://doi.org/10.1007/s10862-005-9004-7>
- World Health Organization (1992). *International classification of diseases ICD-10* (10th ed.). Author.
- World Health Organization (2018). *International classification of diseases for mortality and morbidity statistics* (11th rev.). Retrieved from <https://icd.who.int/browse11/l-m/en>
- Wright, A. G. C., Ringwald, W. R., Hopwood, C. J., & Pincus, A. L. (2022). It's time to replace the personality disorders with the interpersonal disorders. *The American Psychologist, 77*(9), 1085–1099. <https://doi.org/10.1037/amp0001087>
- Zettl, M., Taubner, S., Hutsebaut, J., & Volkert, J. (2019). Psychometrische evaluation der deutschen Version des Semistrukturierten Interviews zur Erfassung der DSM-5 Persönlichkeitsfunktionen (STiP-5.1). *PPmP: Psychotherapie, Psychosomatik, Medizinische Psychologie, 69*(12), 499–504. <https://doi.org/10.1055/a-1010-6887>
- Zimmermann, J., Altenstein, D., Krieger, T., Holtforth, M. G., Pretsch, J., Alexopoulos, J., Spitzer, C., Benecke, C., Krueger, R. F., Markon, K. E., & Leising, D. (2014). The structure and correlates of self-reported DSM-5 maladaptive personality traits: Findings from two German-speaking samples. *Journal of Personality Disorders, 28*(4), 518–540. https://doi.org/10.1521/pedi_2014_28_130
- Zimmermann, J., Benecke, C., Hörz, S., Rentrop, M., Peham, D., Bock, A., Wallner, T., Schauenburg, H., Frommer, J., Huber, D., Clarkin, J. F., & Dammann, G. (2013). Validierung einer deutschsprachigen 16-item-Version des Inventars der Persönlichkeitsorganisation (IPO-16). *Diagnostica, 59*(1), 3–16. <https://doi.org/10.1026/0012-1924/a000076>
- Zimmermann, J., Benecke, C., Hörz-Sagstetter, S., & Dammann, G. (2015). Normierung der deutschsprachigen 16-Item-Version des Inventars der Persönlichkeitsorganisation (IPO-16). *Zeitschrift für Psychosomatische Medizin und Psychotherapie, 61*(1), 5–18. <https://doi.org/10.13109/zptm.2015.61.1.5>
- Zimmermann, J., Ehrenthal, J. C., Cierpka, M., Schauenburg, H., Doering, S., & Benecke, C. (2012). Assessing the level of structural integration using operationalized psychodynamic diagnosis (OPD): Implications for DSM-5. *Journal of Personality Assessment, 94*(5), 522–532. <https://doi.org/10.1080/00223891.1012.700664>
- Zimmermann, J., Falk, C. F., Wendt, L., Spitzer, C., Fischer, F., Bach, B., Sellbom, M., & Müller, S. (2023). Validating the German version of the Personality Disorder Severity-ICD-11 Scale using nominal response models. *Psychological Assessment, 35*(3), 257–268. <https://doi.org/10.1037/pas0001199>
- Zimmermann, J., Hopwood, C. J., & Krueger, R. F. (2023). The DSM-5 level of personality functioning scale. In R. F. Krueger & P. H. Blaney (Eds.), *Oxford textbook of psychopathology* (4th ed., pp. 579–603). Oxford University Press. <https://doi.org/10.1093/med-psych/9780197542521.003.0025>
- Zimmermann, J., Müller, S., Bach, B., Hutsebaut, J., Hummelen, B., & Fischer, F. (2020). A Common metric for self-reported severity of personality disorder. *Psychopathology, 53*(3–4), 168–178. <https://doi.org/10.1159/000507377>
- Zou, G. Y. (2007). Toward using confidence intervals to compare correlations. *Psychological Methods, 12*(4), 399–413. <https://doi.org/10.1037/1082-989X.12.4.399>

Supplementary Material

Supplementary Table 1

Selbst- und interpersonale Funktionsskala (SIFS)

Dieser Fragebogen enthält 24 Aussagen zu Ihrer Persönlichkeit und Ihrer Art, Beziehungen zu pflegen. Wir laden Sie ein, anhand der folgenden Skala zu bewerten, inwieweit Sie sich in diesen Aussagen wiedererkennen:

Das beschreibt mich überhaupt nicht.	Das beschreibt mich ein wenig.	Das beschreibt mich mäßig.	Das beschreibt mich viel.	Das beschreibt mich total
0	1	2	3	4

Bitte antworten Sie spontan nach Ihrem eigenen Eindruck. Es gibt keine richtigen oder falschen Antworten. Wir möchten wissen, wie Sie sich selbst sehen. Es ist wichtig, dass Sie alle Fragen beantworten und nur eine Antwort pro Frage geben.

1 Ich kann die meisten meiner Emotionen gut ertragen und handhaben	0 - 1 - 2 - 3 - 4
2 Mein Selbstwertgefühl wird leicht beeinträchtigt, wenn ich Fehler oder Enttäuschungen erleide	0 - 1 - 2 - 3 - 4
3 Ich fühle eine große Leere in mir	0 - 1 - 2 - 3 - 4
4 Ich neige dazu, meine eigenen Gefühle mit denen anderer zu verwechseln	0 - 1 - 2 - 3 - 4
5 Ich bin verwirrt darüber, wer ich wirklich bin	0 - 1 - 2 - 3 - 4
6 Ich erkenne mich darin, wie andere mich beschreiben	0 - 1 - 2 - 3 - 4
7 Ich habe oft das Gefühl, dass mein Leben keinen Sinn hat	0 - 1 - 2 - 3 - 4
8 Ich setze mir sinnvolle Ziele und treffe realistische Maßnahmen, um diese zu erreichen	0 - 1 - 2 - 3 - 4
9 Manchmal verstehe ich nicht, warum ich mich auf bestimmte Weise verhalten habe oder warum ich Entscheidungen getroffen habe	0 - 1 - 2 - 3 - 4
10 Mein Handeln und meine Entscheidungen richten sich nach meinen unmittelbaren Bedürfnissen, unabhängig von den übrigen	0 - 1 - 2 - 3 - 4

11 Ich ändere oft meine Pläne und meine Lebensziele	0 - 1 - 2 - 3 - 4
12 Meine Handlungen und Entscheidungen stimmen mit meinen Werten und Überzeugungen überein	0 - 1 - 2 - 3 - 4
13 Menschen reagieren oft negativ auf meine Worte oder Handlungen und ich kann nicht genau herausfinden, warum	0 - 1 - 2 - 3 - 4
14 Leute machen mich dafür verantwortlich, dass ich gegenüber anderen unsensibel bin	0 - 1 - 2 - 3 - 4
15 Ich bin oft verwirrt darüber, warum sich Menschen mir gegenüber auf eine bestimmte Weise verhalten	0 - 1 - 2 - 3 - 4
16 Ich habe wenig Interesse an den Gefühlen oder Problemen anderer Menschen	0 - 1 - 2 - 3 - 4
17 Während Diskussionen bin ich neugierig und interessiert an der Sichtweise anderer Personen	0 - 1 - 2 - 3 - 4
18 Wenn jemand nicht wie ich denkt oder mir widerspricht, neige ich dazu, negativ oder wütend zu reagieren, auch wenn die Person respektvoll war	0 - 1 - 2 - 3 - 4
19 Ich habe viele zwischenmenschliche Beziehungen, die für mich und die andere Person befriedigend sind	0 - 1 - 2 - 3 - 4
20 Im Allgemeinen halten meine Freundschaften oder Liebesbeziehungen nicht lange an	0 - 1 - 2 - 3 - 4
21 Wenn ich mit anderen in Beziehung stehe, ist dies in erster Linie deshalb so, weil ich möchte, dass sie einige meiner Bedürfnisse befriedigen	0 - 1 - 2 - 3 - 4
22 Ich habe nicht wirklich das Bedürfnis oder Interesse, eine Beziehung zu anderen zu pflegen	0 - 1 - 2 - 3 - 4
23 Ich traue anderen nicht und halte lieber Abstand zu ihnen, um Missbrauch zu vermeiden	0 - 1 - 2 - 3 - 4
24 Ich habe in meinem Leben viele Menschen, zu denen ich mich verbunden fühle und zu denen ich eine Beziehung habe, die aus Respekt, Zuneigung und gegenseitiger Unterstützung besteht	0 - 1 - 2 - 3 - 4

Scoring instructions: Item 1, 8, 12, 17, 19, 24 are reversed. For a preliminary scoring system, clinician can follow Gamache et al. (2021a) differentiating cut-off for five severity levels of personality functioning (sum score of all 24 SIFS items):

No PD: 0-1.04; Personality accentuation: 1.05-1.29; Mild PD: 1.30-1.89; Moderate PD: 1.90-2.49; Severe PD: 2.50 and above.

Supplementary Table 2*Correlations Between SIFS Scales (22-item SIFS, without item 6 and 10) and STiP-5.1*

Assessments	SIFS				
	ID	SD	EM	INT	Sum
<i>StiP-5.1 total</i>	.74	.67	.57	.65	.78
<i>Identity</i>					
Sense of Self	.77	.66	.49	.63	.76
Self-Esteem	.75	.63	.51	.58	.74
Emotions	.75	.68	.56	.63	.78
<i>Self-direction</i>					
Goals	.62	.62	.37	.45	.61
Standards	.68	.65	.47	.50	.68
Self-Reflection	.63	.61	.46	.52	.66
<i>Empathy</i>					
Comprehension	.60	.52	.48	.53	.63
Tolerance	.46	.44	.54	.52	.57
Effects	.63	.55	.52	.55	.67
<i>Intimacy</i>					
Connection	.61	.48	.50	.65	.67
Closeness	.67	.56	.47	.62	.69
Mutuality	.48	.49	.50	.53	.59

Notes. $N = 116$. Statistically significant p -values $< .001$. SIFS ID = Self- and Interpersonal Functioning Scale identity; SD = self-direction; EM = empathy, INT = intimacy. StiP-5.1 = Semi Structured Interview for Personality Functioning DSM-5.

Supplementary Table 3*Correlations between SIFS Scales (22- item SIFS, without item 6 and 10) and SCID-5-AMPD-I*

Assessments	SIFS				
	ID	SD	EM	INT	Sum
<i>SCID-5-AMPD-I total</i>	.61	.56	.54	.60	.74
<i>Identity</i>					
Sense of Self	.57	.46	.40	.45	.61
Self-Esteem	.65	.47	.38	.47	.65
Emotions	.59	.48	.47	.50	.66
<i>Self-direction</i>					
Goals	.48	.48	.27	.44	.54
Standards	.46	.43	.39	.40	.54
Self-Reflection	.55	.52	.45	.49	.65
<i>Empathy</i>					
Comprehension	.49	.46	.52	.52	.63
Tolerance	.31	.34	.54	.42	.50
Effects	.32	.43	.52	.38	.51
<i>Intimacy</i>					
Connection	.43	.42	.40	.52	.57
Closeness	.52	.44	.46	.58	.65
Mutuality	.43	.47	.39	.58	.59

Notes. $N = 111$. Statistically significant p -values $< .001$. SIFS ID = Self- and Interpersonal Functioning Scale identity; SD = self-direction; EM = empathy, INT = intimacy. SCID-5-AMPD-I = Structured Clinical Interview for the Alternative DSM-5 Model for Personality Disorders – Module I.

Supplementary Table 4

Test Statistic and Fit Indices of CFA of the 24 item and 22 item (without item 6 and 10) and method factor for reversed items version of the SIFS

Model	χ^2 (df)	CFI	TLI	RMSEA	SRMR
<i>24-item version</i>					
5	2853.050 (252)	.637	.602	.119	.103
6	1949.531 (251)	.763	.739	.097	.087
7	1755.378 (246)	.790	.764	.092	.084
8	1898.700 (248)	.771	.745	.096	.093
<i>22-item version (without item 6 and 10)</i>					
5	2583.606 (209)	.652	.616	.126	.105
6	1668.336 (208)	.786	.762	.099	.082
7	1483.934 (203)	.813	.787	.094	.079
8	1630.468 (205)	.801	.776	.098	.092
<i>22-item version (without item 6 and 10) and a method factor for reversed items</i>					
5	2200.604 (203)	.710	.670	.117	.098
6	1277.288 (202)	.844	.822	.086	.073
7	1091.832 (197)	.871	.849	.079	.073
8	1279.318 (199)	.845	.820	.086	.085

Notes. $N = 886$. All values are according to the robust indices. All p -values $< .000$. CFI = Comparative Fit Index. RMSEA = Root Mean Square Error of Approximation. SRMR = Standardized Root Mean Residual. TLI = Tucker-Lewis Index. **Model 5:** a basic one-factor model with all items loading on one factor (personality functioning). **Model 6:** a two factor model with two dimensions of self and interpersonal dimensions as factor. **Model 7:** a four-factor model with identity, self-direction, empathy, and intimacy ID, SD, EM, INT as factors. **Model 8:** a four factor hierarchical model with the four uncorrelated factors (identity, self-direction, empathy, and intimacy) loading on the general personality pathology factor.

Appendix C

Study III

Kerber, A. *, **Macina, C.** *, Ohse, L., Kampe, L., Knaevelsrud, C., Wrege, J.S.*, Hörz-Sagstetter, S. *, (2024). Determining essential dimensions for the clinical approximation of personality dysfunction severity – a multimethod study. Manuscript under review at BJPsych.

* Shared first authorship and shared last authorship

**Determining essential dimensions for the clinical approximation of personality
dysfunction severity - a multimethod study**

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Abstract

Decades of research on the dimensional nature of personality disorder (PD) have led to the replacement of categorical PD diagnoses by a dimensional assessment of personality dysfunction severity (PDS) in ICD-11, which essentially corresponds to the dimensional PD model in Section III of DSM-5. Besides advancing the focus in the diagnosis of PD on impairments in self and interpersonal functioning, this shift also urges clinicians worldwide to get familiar with new diagnostic approaches. This study investigated which PDS dimensions among different assessment methods and conceptualizations have the most predictive value for overall PDS. Using multi-method assessments with (semi-)structured clinical interviews and self-ratings of personality functioning, personality organization, and personality structure in clinical samples of different settings in Switzerland and Germany ($n = 285$), we calculated a latent, method-adjusted general factor for PDS (g-PDS) by applying a correlated trait correlated method – 1 model. Our results showed that four interview-assessed PDS dimensions - *defense mechanisms, desire and capacity for closeness, sense of self with boundaries to others, and understanding and appreciation of experiences and motivations of others* account for 95.0% of variance of g-PDS, with a combination of either two of these four dimensions already explaining between 81.8% and 91.3%. Regarding self-reports, the dimensions *depth and duration of connections, emotional range and regulation, and object perception* predicted 69.5% of the variance of a latent interview-based score, with all investigated self-reported dimensions together adding up to 74.9% variance explanation. Taken together, our data suggest that focusing on specific subdomains of, e.g., intimacy and identity in time-limited settings might be effective in determining PDS.

Keywords: Personality dysfunction severity (PDS); DSM-5 alternative model for personality disorders (AMPD); Criterion A; dimensional assessment of personality; personality disorder in ICD-11

Introduction

Personality Functioning (PF) and Personality Dysfunction Severity (PDS)

The implementation of a dimensional assessment of personality dysfunction severity (PDS) in the International Classification of Mental and Behavioral Diseases (11th ed.; ICD-11, World Health Organization (WHO), 2022 (1)) and the Alternative Model for Personality Disorders (AMPD) in the Diagnostic and Statistical Manual for Mental Disorders (5th ed.; DSM-5, American Psychiatric Association (APA), 2013 (2)) represents a crucial step towards an empirically based model for the diagnosis of personality disorder (PD). This paradigm shift was motivated by limitations of the categorical approach, such as high comorbidity and low specificity (3–5). According to ICD-11, PDS is characterized by impairments in functioning of the self (e.g., identity, self-worth, capacity for self-direction), and/or problems in interpersonal functioning (e.g., developing and maintaining close and mutually satisfying relationships, understanding others' perspectives, managing conflict in relationships). This definition largely corresponds to personality functioning (PF, see Table 1), as operationalized in the Level of Personality Functioning Scale (LPFS; (6)) in the AMPD (for a detailed differentiation of the AMPD and PDs in ICD-11, see (7)). According to Criterion A of the AMPD, a PD diagnosis requires at least moderate impairment in PF. Using PF as an indicator for PDS provides relevant clinical insights for individual treatment planning (8–10), high clinical utility (11), and information on subthreshold personality difficulties (12)

Measures for PF and PDS

The inclusion of a dimensional conceptualization of PD in the DSM-5 AMPD and in ICD-11, has led to the development of numerous new instruments to operationalize PDS, including validated self-report questionnaires – e.g., the LPFS-Self Report (LPFS-SR, (13)) – and interviews – e.g., the Structured Clinical Interview for the AMPD – Module I (SCID-5-AMPD-I; (14), and the Semi-structured Interview for PF DSM-5 (STiP-5.1; (15)). Based on these measures, research on validity and reliability of PF as an indicator for PDS has been accumulated (16,17). It is important to note that the dimensional conceptualization of PDS in DSM-5 is based on long-standing psychodynamic theories of personality pathology, such as the concepts of personality organization (PO, see Table 1), object relations, and mentalization (6).

Consequently, validated measures based on these concepts, such as the inventory of PO (IPO-30; (18)), the structured interview for PO (STIPO-R; (19)) or the personality structure (PS) axis of the operationalized psychodynamic diagnosis system (20) with its OPD-Structure Questionnaire (OPD-SQ, (21)) have shown high utility and convergence in assessing PDS according to the new models (22).

Determining essential dimensions for the clinical approximation of PDS

The effort of structured interviews and the wide choice of PDS instruments contrasts with challenges regarding time constraints in clinical settings. However, as previous research has shown that specific PDS dimensions¹ are highly correlated and reveal a strong latent general factor of PD (g-PDS; (16)), brief but empirically sound core dimensions of PDS can be identified in order to provide clinicians with indicators to focus on in time-limited settings. While self-report questionnaires can aid in approximating PDS when time is lacking, PD is considered to be most reliably assessed by semi-structured interviews (23,24). Hence, it is of interest for clinicians to know which self-reported dimensions of PDS show highest congruence with an interview-based assessment. Therefore, based on validated PDS assessments, the aims of this study were to determine the most central PDS dimensions for approximating g-PDS and to identify self-reported PDS dimensions that most reliably approximate the interview-based g-PDS. To these aims, we conducted combined data from two studies assessing a total of $n = 285$ participants with multiple interviews (SCID-5-AMPD-I, STiP-5.1, and STIPO-R) and self-report questionnaires (LPFS-SR, IPO-30, and OPD-SQ) for the assessments of PDS, and investigated PDS dimensions using structural equation modeling together with the Best Items Scale that is Cross-validated, Unit-weighted, Informative and Transparent algorithm (BISCUIT; (25)).

Methods

Procedure and participants

Between July 2020 and April 2022, two multimethod studies were conducted in Germany and Switzerland with the combined data comprising $n = 285$ subjects. The German clinical sample ($n = 121$), consisted of a mixed clinical outpatient and inpatient sample (for more information, see (26)). The Switzerland sample consisted of outpatients from a psychiatric

¹ We use the umbrella term *dimensions* for a combination of different constructs used in this study, for the LPFS (interview and self-rating), we refer to subdomains (12 LPFS subdomains), and for the IPO-30, OPD-SQ, STIPO-R, we refer to *domains*.

department of the University Clinics Basel ($n = 135$) and a nonclinical sample recruited via the University of Basel website ($n = 29$; for more information, see (27)). Overall, subjects were aged between 18 and 65 years ($M = 29.3$, $SD = 10.5$), thereof 65.0% women, and 83.6% without children. 67.5% had regular work, 28.2% had a university degree. Overall, 63.2% scored above the cutoff score of 1.49 in two LPFS domains, indicating the presence of a PD according to Buer Christensen et al. (2019). Overall, 40.4% were using psychotropic medication. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. All procedures involving human subjects were approved by the Ethics Committee of the Psychologische Hochschule Berlin (Nr. 2020-0214) and the Northwestern and Central Swiss Ethics Committee (Nr. 2020-02547), and written informed consent was obtained from all subjects.

Measures

Semi-Structured Interview for Personality Functioning DSM-5 (STiP-5.1; (15)).

The STiP-5.1 is a semi-structured interview with excellent interrater reliability for the twelve subdomains and the total score of the LPFS, as defined in DSM-5 AMPD (see Table 1). Each subdomain is rated from *no impairment* (0) to *extreme impairment* (4). The STiP-5.1 was assessed in the Switzerland sample; for details on the assessment procedure, see Macina et al. (27).

Structured Clinical Interview for the AMPD – Module I (SCID-5-AMPD-I; (14)).

The SCID-5-AMPD-I is a structured interview for the twelve subdomains (rated from *no impairment* (0) to *extreme impairment* (4)) and the total score of the LPFS, as defined in DSM-5 AMPD. The SCID-5-AMPD-I shows excellent psychometric properties and was assessed in the German sample, for details see Ohse et al. (26).

Structured Interview for Personality Organization - Revised (STIPO-R; (19)). The STIPO-R is a semi-structured interview to assess the level of PO based on Kernberg's object relations model (28). The STIPO-R contains 55 items, which can be rated on a 3-point scale, from absent (0) to present (2) pathology, and aggregated arithmetically to six domains: identity, object relations, defense mechanism, aggression, moral values, and narcissism. These six domains can also be rated via clinical impression from *no pathology* (1) to *very severe pathology* (5). For the following analyses, we aggregated the z-standardized clinical and arithmetic domain ratings. The STIPO shows high reliability and validity (29), the revised version is currently being validated in another study (Hörz-Sagstetter et al., in preparation (30)).

Level of Personality Functioning Scale – Self Report (LPFS-SR; (13)). The LPFS-SR is a self-report questionnaire for the twelve subdomains of the LPFS and the total score of the LPFS with excellent psychometric properties, as defined in the DSM-5 AMPD. It includes 80 statements, which are rated on a 4-point Likert scale ranging from *totally false* (1) to *very true* (4).

Operationalized Psychodynamic Diagnosis – Structure Questionnaire (OPD-SQ; (21)). The OPD-SQ is a self-report assessment for the PS axis of the OPD (31) that shows satisfying psychometric properties. The OPD-SQ comprises eight domains with 95 items (see Table 1). The items are rated on a 5-point Likert scale ranging from *not true at all* (0) to *fully true* (4).

Inventory of Personality Organization (IPO-30; (18)). The IPO-30 measures PO according to Kernberg's model of object relations, using 30 items, which are rated on a 5-point Likert scale ranging from *never true* (1) to *always true* (5). For the analyses in this study, we calculated scores for the five PO domains of identity, primitive defenses, aggression, moral values, and reality testing using the original allocation of the IPO-30 items in the long version of the scale.

The German clinical sample completed a total of two interviews (SCID-5-AMPD-I and STIPO-R) and three self-reports (OPD-SQ, IPO-30, and LPFS-SR) for PDS, while the Basel mixed sample completed one interview (STiP-5.1) and two self-reports for PDS (OPD-SQ and IPO-30). The total number of available assessments were $n = 285$ (SCID-5-AMPD-I or STiP-5.1: LPFS interview), $n = 107$ (LPFS-SR), $n = 57$ (STIPO-R: PO interview), $n = 230$ (IPO-30), and $n = 163$ (OPD-SQ). The number of pairwise available assessments can be found in Supplementary Table 1.

Statistical analysis

Statistical analyses were conducted using the software R (32). We investigated the comparability of the samples with regard to the distribution of PDS among participants, and PDS dimension scores were checked for normality utilizing histograms and cutoffs for skewness < 2 and kurtosis < 7 (33).

Calculation of method factor

First, to estimate the systematic variance due to the assessment method, total scores of interview- and self-report-assessed LPFS (STiP-5.1, SCID-5-AMPD-I, LPFS-SR), interview-

and self-report-assessed domains of PO (STIPO-R, IPO-30), and self-report-assessed OPD PS (OPD-SQ) were subjected to a parallel analysis, followed by an exploratory factor analysis with the proposed number of factors.

In a second step, we constructed a correlated trait correlated method minus one model (CT-C(M-1); (34)) with a g-PDS factor loading on all dimensions of above-described PDS assessments (interview and self-report) and an orthogonal method factor, which loaded only on self-reported dimensions (see Figure 1). By this means, we extracted a method-adjusted g-PDS factor using multiple assessment methods and PDS dimensions that is most closely aligned with the gold-standard of interview and clinician-based assessment of PDS.

Identifying central dimensions of PDS

First, by examining the factor loadings on the method-adjusted g-PDS factor of the CT-C(M-1) model, we could draw conclusions about which PDS dimensions capture most of the g-PDS variance. Investigating which self-reported PDS dimensions show greater or equal loadings on the method factor than on the method-adjusted g-PDS factor allowed conclusions on their susceptibility for bias through self-report method. Based on the ranking identified by the g-PDS loadings in the CT-C(M-1) model, multiple linear regression models were calculated by sequentially taking manifest scores of the respective PDS dimensions into the model. Using this approach enabled to approximate which combination of PDS may suffice to approximate method-adjusted g-PDS most closely.

Second, a latent PDS score was calculated using only the interview-based assessments. Using the factor scores of the interview-based PDS factor as the dependent variable, the BISCUIT algorithm was used to calculate bootstrapped correlations with self-reported PDS dimensions. Based on the ranking of most predictive self-reported PDS dimensions identified by the BISCUIT algorithm, multiple linear regression models were calculated by sequentially taking additional dimensions into the model. We interpreted the correlations' and standardized factor loadings' effect sizes as follows: small = .10, medium = .30, and large = .50 (35).

Minding the bias of most fit indices in models with high average factor loadings and many parameters (36), which applies to the CT-C(M-1) model used in our study, model fit for the factor analytical models was assessed through the unbiased Standardized Root Mean Square Residual (uSRMR) using a cutoff value of 0.1 times the average R^2 of manifest variables (37).

Results

Method factor

All assessments of PDS dimensions were normally distributed, except for the IPO-30 domain aggression (skewness: 2.1 and kurtosis: 10.3), which we subsequently omitted. Correlations of the LPFS interview total score with the total scores of the other assessments ranged from medium associations with the IPO-30 ($r = .46$) to strong correlations with the LPFS-SR ($r = .78$), STIPO-R ($r = .79$), and OPD-SQ ($r = .68$) total scores (see Table 2). Based on the total scores of the five assessments, parallel analysis suggested extracting two factors, with the first factor showing predominantly loadings of self-report questionnaires (OPD-SQ, LPFS-SR, and IPO-30) and the second factor showing loadings of interviews (SCID-5-AMPD-I and STiP-5.1 combined for LPFS, and STIPO-R). Following this analysis, we constructed a CT-C(M-1) model (Figure 1), with the g-PDS factor defined by average scores of all assessments and an orthogonal method factor defined by self-report assessments yielding good model fit based on full information robust maximum likelihood estimation (uSRMR = .040, cutoff = .079). To investigate loadings and variance explanations of g-PDS by all PDS dimensions and subdomains we additionally constructed a latent CT-C(M-1) model with twelve LPFS subdomains for self-report and interview each, six STIPO-R domains, four IPO-30 domains and eight OPD-SQ domains, again with an orthogonal method factor defined by all self-report assessments. This procedure yielded a strong and reliable method-adjusted g-PDS (explained common variance = 76.7%, ω hierarchical = .84).

Dimensions of PDS with substantial method variance

All self-reported PDS dimensions showed at least medium method variance, i.e., factor loadings $> .30$ on the method factor, except for the two LPFS-SR empathy subdomains *understanding of effects of own behavior on others*, and *understanding and appreciation of experiences and motivations of others*, the LPFS-SR intimacy subdomain *depth and duration of connections*, and the IPO-30 domain *moral values*, showing standardized factor loadings $< .30$. All eight OPD-SQ domains as well as the LPFS-SR subdomains *sense of self with boundaries to others*, *stability and accuracy of self-esteem*, *emotional range and regulation* (identity domain) and *constructive and prosocial internal standards of behavior* (self-direction domain) showed large method variance with standardized factor loadings $> .50$ on the method factor (see gray triangles in Figure 2). Self-reported domains that loaded stronger on the method factor than on g-PDS were the IPO-30 domains *primitive defense mechanisms*, *aggression*, and *reality testing*, as well as the OPD-SQ domains *self-perception*, *self-regulation*, *regulation of relations*, *communication with others*, and *attachment capacity to external objects*. PDS

dimensions that correlated low with method-adjusted g-PDS were IPO-30 *reality testing* ($r = .31$), LPFS-SR self-direction *ability to pursue meaningful short- and long-term goals* ($r = .40$) which we subsequently omitted.

Approximation of method-adjusted g-PDS by interview- and self-reported PDS dimensions

Figure 2 shows standardized factor loadings (blue and red circles in Figure 2) and sequential R^2 of multiple regression models with the method-adjusted g-PDS factor as dependent variable and manifest self- and interview-assessed PDS dimensions as independent variable (green line). Highest standardized factor loading was found for the interview-assessed dimensions of PDS. Four PDS dimensions showed loadings $> .80$ on method-adjusted g-PDS: STIPO-R domain *defense mechanisms*, LPFS intimacy subdomain *desire and capacity for closeness*, LPFS identity subdomain *sense of self*, and LPFS empathy subdomain *understanding and appreciation of experiences and motivations of others*. A combination of either two of these four dimensions explained between 81.8% (*defense mechanisms* and *sense of self*) and 91.3% (*defense mechanisms* and *desire and capacity for closeness*).

Regarding the approximation of a latent interview-based PDS factor based on the twelve LPFS subdomains and six STIPO-R domains, self-reported PDS dimensions *depth and duration of connections* (LPFS-SR intimacy domain) *emotional range and regulation* (LPFS-SR identity subdomain), and the OPD-SQ domain *object perception* predicted 69.5% of the variance of a latent interview-based score. All investigated self-reported PDS dimensions together added up to 74.9% variance explanation. Detailed results can be found in Figure 3.

Discussion

The aim of this study was to identify core dimensions of PDS, which could be particularly useful in time-limited settings. To this end, we assessed a mixed clinical and non-clinical sample with six semi-structured interviews and self-reports for PF, PO, and SI.

Essential dimensions of a latent method-adjusted g-PDS factor

Within interview-assessed PDS, the LPFS intimacy subdomain *capacity and desire for closeness*, and within self-reported PDS, the LPFS intimacy subdomain *depth and duration of connections* showed high variance explanation of g-PDS. These two LPFS intimacy subdomains trace back to the quality of object relations scale (QORS; (38)) and the Social Cognitions and Object Relations Scale (39), two observer rating methods that were centrally incorporated in the construction of the DSM-5 LPFS (6). Previous investigations using the

SCORS already found the dimension *capacity for emotional investment in relationships* as highly indicative for PD (40). These findings align with object relations theory's core assertion that early adversities in the interplay between an individual's inherent temperament and environmental interpersonal resources may shape maladaptive self- and other representations as well as over-representations of relationships predominated by negative affect, which is especially detrimental for (future) intimate relationships (41). More recent investigations of other authors even postulate that the term PD should be replaced by interpersonal disorders (42,43), reflecting the centrality of interpersonal etiology and symptomatology in most PDs. In addition, there is ample evidence for the association of attachment-related problems in close relationships and PD (44).

In addition, our results have shown that *defense mechanisms* were another highly predictive dimension to approximate g-PDS. In general, *defense mechanisms* can be understood as unconscious coping mechanisms to deal with conflicting within-person motives triggered by life events or conditions. These can have more mature forms, such as humor or intellectualization, or immature forms, such as projection or denial (45). Recent findings in a large representative sample found pathological or immature defense mechanisms to be highly associated with psychopathology (46). Within the conceptual framework of PO, which was another influential concept within DSM-5 LPFS (6), *defense mechanisms* are a central indicator of the severity of personality dysfunction (28). Additionally, the high discrepancy between the explained variance of interview-assessed STIPO-R defense mechanisms and self-rated IPO-30 domain primitive defense in our results suggests that *defense mechanisms* is a construct that can be assessed particularly well by experienced clinicians, as the subtleties of defensive patterns might not be assessed as reliably in a short self-report format.

Our results also show that another PDS dimension capturing large amounts of g-PDS variance is the interview-assessed LPFS subdomain *sense of self with boundaries to others*. This result corresponds to existing evidence on associations of the identity domain and PDS (47,48). Interestingly, also the two remaining interview-assessed LPFS identity subdomains (*stability and accuracy of self-esteem* and *emotional range and regulation*) and the STIPO-R identity domain showed high predictive value ($r > .65$), but explain little additional variance if added to LPFS *sense of self* in a sequential regression model, indicating high convergence of this construct within the frameworks of PF and PO. *Sense of self* refers to a continuous, differentiated, coherent experience of an authentic, vital subject with boundaries to others.

While in Section II of DSM-5, four of the nine borderline PD criteria refer directly to impairments in *sense of self* (unstable self-image and sense of self, affective instability, chronic feeling of emptiness, dissociative symptoms), these dimensions are also found to be central predictors of general psychopathology (49). It is important to note that all LPFS identity subdomains showed moderate to strong method variance, indicating that these PDS dimensions should be assessed using an observer-based method. However, despite the moderate method variance, the self-reported subdomain of *emotional range and regulation* showed high variance explanation for interview-assessed PDS, which suggests that this subdomain of the identity domain may nevertheless constitute a reliable self-report indicator of PDS.

Regarding findings of high convergences with method-adjusted g-PDS of the interview-assessed empathy subdomain *understanding and appreciation of experiences and motivations of others*, and the self-reported subdomain *understanding of effects of own behavior on others*, our results are consistent with recent findings that impairments in empathy are a marker of general personality pathology (50). These LPFS subdimensions trace back to the incorporation of the mentalization concept within the LPFS empathy domain (6). Mentalization concerns the ability to perceive and interpret one's own and others' internal mental states, encompassing feelings, thoughts, and motives, which is highly associated with PD and psychopathology in general (51,52). This could also explain our results of high variance explanation of interview-assessed PDS with the self-report OPD-SQ domain object perception, which also assesses mentalization abilities. Interestingly, empathy impairments seem to be due to a disadvantageous interaction with identity diffusion, i.e., a risk of emotional contagion of one's own emotions triggered through the emotions of others, which prevents genuine understanding of others (53), highlighting the interplay of the subdomains within our findings (e.g., sense of self and empathy).

Implications for clinical routine

Our findings suggest that impairments in identity and intimacy are highly indicative to approximate PDS. Defense mechanisms is the most indicative dimension but requires psychodynamic knowledge and training. It may therefore be worthwhile to get training in the assessment of defense mechanisms with respect to treatment and individual case planning. Furthermore, PDs are highly prevalent and comorbid in mental health care (54) with PDS dimensions of identity diffusion and interpersonal problems being highly predictive for general

psychopathology (49). Routine assessment of PDS dimensions found in this study may therefore be beneficial in case conceptualizations for all kinds of psychopathology.

As an example, interview questions to assess “the degree to which the individual experiences itself as unique with clear boundaries between self and others” (DSM-5 LPFS identity subdomain *sense of self*) could be “How would you describe yourself as a person?” and “To what extent do your feelings about yourself fluctuate?” (STiP 5.1; 15). To assess “the need for, and ability to achieve, emotional and psychological closeness with others” (DSM-5 LPFS intimacy subdomain *desire and capacity for closeness*) questions like “Are you close to a number of people in your life?” or “Do the people you form relationships with inevitably hurt or disappoint you?” may be helpful (SCID-5-AMPD; 14). To assess “the degree to which the individual comprehends and appreciates others' experiences and motivations” (DSM-5 LPFS empathy subdomain *understanding and appreciation of others' experiences and motivations*), questions like “Do you usually know what makes other people tick and why they do the things they do?” or “Is it hard for you to understand why people do things that hurt or upset you?” (SCID-5-AMPD; 14) may be helpful.

To assess “conscious, subjective affective, cognitive and behavioral correlates of primitive defense mechanisms” (29), the question “Have people pointed out that you tend to blame others or circumstances, for things that happen to you, or that you have difficulty accepting responsibility for your actions?” (STIPO-R; 19) could be helpful.

Limitations and Implications

Some limitations should be noted. First, comparing the predictive power of PDS dimensions that were assessed within an interview that has a certain chronological order should be interpreted with caution. For example, implicit knowledge gained about the subject through assessments of LPFS identity, self-direction and empathy domains may be incorporated in the rating of the intimacy domain, which is assessed last in both LPFS interviews used in this study. Second, the variance explanation found for the interview-assessment of the g-PDS in the multiple regression is inflated, as we predict a latent, interview-based score with dimensions of these interviews. However, both interview-assessed and self-reported LPFS intimacy subdomains exhibited highest correlations with g-PDS, both with interview and self-reports modeled in one model and separately, suggesting that this finding is no artifact of assessment or modeling method. Third, we assessed only a small sample of STIPO-R interviews, though the even distribution and normality of the available data on this assessment was given. Fourth,

the construction of the method-adjusted model lacked an interview for PS according to OPD-3. This probably led to specific variance of the OPD conceptualization of PF to be allocated in the method factor and therefore not represented in the g-PDS. Despite this methodological problem, one of the OPD domains (object perception) showed strong correlation with the g-PDS. Further limitations regarding the inter-rater reliability in the Switzerland sample can be found in (27).

Conclusion

Profound PD diagnosis is time-consuming and challenging. Therefore, the present study investigated two semi-structured interviews and three self-reports of PF, PO and PS that align with a method adjusted g-PDS for PDS. We identified self-reported LPFS dimensions, *depth and duration of connections*, *understanding of effects of own behavior on others* and *understanding of others experiences and motivations* to exhibit only small bias due to self-report assessment method. The four interview-assessed dimensions *defense mechanisms* (STIPO-R), *desire and capacity for closeness* (LPFS domain intimacy), *sense of self with boundaries to others* (LPFS domain identity), and *understanding and appreciation of experiences and motivations of others* (LPFS domain empathy) revealed to be highly indicative of a method-adjusted g-PDS. Taken together, we recommend to assess at least the latter three LPFS dimensions, which do not require extensive training (55), when time is limited, and that explicit incorporation of defense mechanisms could improve future PD assessment nosologies in DSM and ICD. Future research should also investigate how and if knowledge of psychodynamic theories behind PF could improve the utility of case conceptualizations based on the LPFS.

References

1. World Health Organization. ICD-11: International classification of diseases (11th revision) [Internet]. 2022. <https://icd.who.int/>
2. American Psychiatric Association. Diagnostic and statistical manual of mental disorders: DSM-5™ (5th ed.). Arlington, VA: American Psychiatric Publishing, Inc.; 2013.
3. Tyrer P, Mulder R, Kim YR, Crawford MJ. The Development of the ICD-11 Classification of Personality Disorders: An Amalgam of Science, Pragmatism, and Politics. *Annu Rev Clin Psychol*. 2018;22.
4. Zimmerman M, Galione JN, Chelminski I, Young D, Dalrymple K, Morgan TA. Does the diagnosis of multiple Axis II disorders have clinical significance? *Ann Clin PSYCHIATRY*. 2012;7.
5. 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.
6. Bender DS, Morey LC, Skodol AE. Toward a Model for Assessing Level of Personality Functioning in *DSM-5*, Part I: A Review of Theory and Methods. *J Pers Assess*. 2011;93(4):332–46.
7. Zimmermann J, Hopwood CJ, Krueger RF. The DSM-5 Level of Personality Functioning Scale. In: Krueger RF, Blaney PH, Herausgeber. *Oxford Textbook of Psychopathology* [Internet]. 4. Aufl. Oxford University Press New York; 2023.. <https://academic.oup.com/book/45782/chapter/400200852>
8. Bach B, Mulder R. Clinical Implications of ICD-11 for Diagnosing and Treating Personality Disorders. *Curr Psychiatry Rep*. Oktober 2022;24(10):553–63.
9. Bach B, Simonsen S. How does level of personality functioning inform clinical management and treatment? Implications for ICD-11 classification of personality disorder severity. *Curr Opin Psychiatry* [Internet]. 2021;34(1). https://journals.lww.com/co-psychiatry/Fulltext/2021/01000/How_does_level_of_personality_functioning_inform.10.aspx
10. Bach B, Tracy M. Clinical utility of the alternative model of personality disorders: A 10th year anniversary review. *Personal Disord Theory Res Treat*. 2022;13(4):369–79.
11. Bornstein RF, Natoli AP. Clinical utility of categorical and dimensional perspectives on personality pathology: A meta-analytic review. *Personal Disord Theory Res Treat*. 2019;10(6):479–90.

12. Hansen SJ, Christensen S, Kongerslev MT, First MB, Widiger TA, Simonsen E, u. a. Mental health professionals' perceived clinical utility of the ICD-10 vs. ICD-11 classification of personality disorders. *Personal Ment Health*. 2019;13(2):84–95.
13. Morey LC. Development and Initial Evaluation of a Self-Report Form of the DSM–5 Level of Personality Functioning Scale. *Psychol Assess* [Internet]. 2017; <http://psycnet.apa.org/psycarticles/2017-08721-001.pdf&productCode=pa>
14. Bender DS, Skodol AE, First MB, Oldham J. Structured clinical interview for the DSM-5® alternative model for personality disorders (SCID-5-AMPD) module I level of personality functioning scale. Wash DC APPI. 2018.
15. Hutsebaut J, Kamphuis JH, Feenstra DJ, Weekers LC, De Saeger H. Assessing DSM–5-oriented level of personality functioning: Development and psychometric evaluation of the Semi-Structured Interview for Personality Functioning DSM–5 (STiP-5.1). *Personal Disord Theory Res Treat*. 2017;8(1):94–101.
16. Morey LC, McCredie MN, Bender DS, Skodol AE. Criterion A: Level of personality functioning in the alternative DSM–5 model for personality disorders. *Personal Disord Theory Res Treat*. 2022;13(4):305–15.
17. Sharp C, Wall K. DSM-5 Level of Personality Functioning: Refocusing Personality Disorder on What It Means to Be Human. *Annu Rev Clin Psychol*. 2021;17(1):313–37.
18. Hörz-Sagstetter S, Volkert J, Rentrop M, Benecke C, Gremaud-Heitz DJ, Unterrainer HF, u. a. A Bifactor Model of Personality Organization. *J Pers Assess*. 2020;1–12.
19. Clarkin J, Caligor E, Stern B, Kernberg O. The structured interview for personality organization-revised (STIPO-R). New York, NY. 2016.
20. OPD Task Force. Operationalized Psychodynamic Diagnosis: Manual for Diagnosis and Treatment Planning. 2. Edition. Cambridge, MA, USA: Hogrefe & Huber; 2008.
21. Ehrental JC, Dinger U, Horsch L, Komo-Lang M, Klinkerfuss M, Grande T, u. a. [The OPD Structure Questionnaire (OPD-SQ): first results on reliability and validity]. *Psychother Psychosom Med Psychol*. 2012;62(1):25–32.
22. Hörz-Sagstetter S, Ohse L, Kampe L. Three Dimensional Approaches to Personality Disorders: a Review on Personality Functioning, Personality Structure, and Personality Organization. *Curr Psychiatry Rep*. 2021;23(7):45.
23. Oltmanns JR, Oltmanns T. Self–Other Agreement on Ratings of Personality Disorder Symptoms and Traits: Three Meta-Analyses. 2019; <https://psyarxiv.com/mka3j/>
24. Samuel DB, Sanislow CA, Hopwood CJ, Shea MT, Skodol AE, Morey LC, u. a.

- Convergent and incremental predictive validity of clinician, self-report, and structured interview diagnoses for personality disorders over 5 years. *J Consult Clin Psychol*. 2013;81(4):650–9.
25. Elleman LG, McDougald SK, Condon DM, Revelle W. That Takes the BISCUIT. *Eur J Psychol Assess*. 2021.
 26. Ohse L, Zimmermann J, Kerber A, Kampe L, Mohr J, Kendlbacher J, u. a. Reliability, structure, and validity of module I (personality functioning) of the Structured Clinical Interview for the alternative DSM–5 model for personality disorders (SCID-5-AMPD-I). *Personal Disord Theory Res Treat [Internet]*. 2022; <http://doi.apa.org/getdoi.cfm?doi=10.1037/per0000576>
 27. Macina C, Kerber A, Zimmermann J, Ohse L, Kampe L, Mohr J, u. a. Evaluating the Psychometric Properties of the German Self and Interpersonal Functioning Scale (SIFS). *J Pers Assess*. 2023;1–13.
 28. Hörz-Sagstetter S, Caligor E, Preti E, Stern BL, De Panfilis C, Clarkin JF. Clinician-Guided Assessment of Personality Using the Structural Interview and the Structured Interview of Personality Organization (STIPO). *J Pers Assess*. 2018;100(1):30–42.
 29. Doering S, Burgmer M, Heuft G, Menke D, Bäumer B, Lübking M, u. a. Reliability and validity of the German version of the Structured Interview of Personality Organization (STIPO). *BMC Psychiatry*. 2013;13(1):210.
 30. Hörz-Sagstetter S, Ohse L, Rentrop M, Blüml V, Doering S, Waschulin L, u. a. Psychometric properties of the German version of the revised Structured Interview of Personality Organization (STIPO-R). (in preparation)
 31. OPD Task Force. Operationalized Psychodynamic Diagnosis: Manual for Diagnosis and Treatment Planning. 3. Edition. Göttingen: Hogrefe; 2023.
 32. R Core Team. R: A language and environment for statistical computing [Internet]. Vienna, Austria: R Foundation for Statistical Computing; 2023. <https://www.R-project.org/>
 33. West SG, Finch JF, Curran PJ. Structural equation models with nonnormal variables: Problems and remedies. 1995.
 34. Eid M, Nussbeck FW, Geiser C, Cole DA, Gollwitzer M, Lischetzke T. Structural equation modeling of multitrait-multimethod data: Different models for different types of methods. *Psychol Methods*. 2008;13(3):230–53.
 35. Cohen J. A power primer. *Psychol Bull*. 1992.

36. Shi D, Maydeu-Olivares A, DiStefano C. The Relationship Between the Standardized Root Mean Square Residual and Model Misspecification in Factor Analysis Models. *Multivar Behav Res.* 2018;53(5):676–94.
37. Ximénez C, Maydeu-Olivares A, Shi D, Revuelta J. Assessing Cutoff Values of SEM Fit Indices: Advantages of the Unbiased SRMR Index and Its Cutoff Criterion Based on Communality. *Struct Equ Model Multidiscip J.* 2022;29(3):368–80.
38. Azim HF, Piper WE, Segal PM, Nixon GW, Duncan SC. The quality of object relations scale. *Bull Menninger Clin.* 1991;55(3):323.
39. Westen D. Social Cognition and Object Relations. *Psychol Bull.* 1991.
40. Westen D, Lohr N, Silk KR, Gold L, Kerber K. Object Relations and Social Cognition in Borderlines, Major Depressives, and Normals: A Thematic Apperception Test Analysis. *Psychol Assess.* 1990.
41. Kernberg OF, Caligor E. A Psychoanalytic Theory of Personality Disorders. In: Major theories of personality disorder, 2nd ed. New York, NY, US: The Guilford Press; 2005.
42. Hopwood CJ. Interpersonal Dynamics in Personality and Personality Disorders. *Eur J Personal [Internet].* 2018 ;0(0).<https://onlinelibrary.wiley.com/doi/abs/10.1002/per.2155>
43. Pincus AL. An interpersonal perspective on Criterion A of the DSM-5 Alternative Model for Personality Disorders. *Curr Opin Psychol.* 2018;21:11–7.
44. Levy KN, Scala JW, Temes CM, Clouthier TL. An integrative attachment theory framework of personality disorders. In: Huprich SK, Herausgeber. Personality disorders: Toward theoretical and empirical integration in diagnosis and assessment [Internet]. Washington: American Psychological Association; 2015. S. 315–43. <http://content.apa.org/books/14549-014>
45. Cramer P. Understanding Defense Mechanisms. *Psychodyn Psychiatry.* 2015;43(4):523–52.
46. Blanco C, Kampe L, Wall MM, Liu SM, Wang S, Caligor E, u. a. Approximating defense mechanisms in a national study of adults: prevalence and correlates with functioning. *Transl Psychiatry.* 2023;13(1):21.
47. Bogaerts A, Luyckx K, Bastiaens T, Kaufman EA, Claes L. Identity Impairment as a Central Dimension in Personality Pathology. *J Psychopathol Behav Assess.* 2021;43(1):33–42.
48. Kampe L, Hörz-Sagstetter S. Fähigkeit zur Selbstbeschreibung als Dimension des Persönlichkeitsfunktionsniveaus: Drei diagnostische Fallanalysen. *Psychotherapeut.*

2022;67(2):122–8.

49. Gluschkoff K, Jokela M, Rosenström T. General psychopathology factor and borderline personality disorder: Evidence for substantial overlap from two nationally representative surveys of U.S. adults. *Personal Disord Theory Res Treat*. 2021;12(1):86–92.
50. Ohse L, Zimmermann J, Kerber A, Kampe L, Mohr J, Schierz R, u. a. Impairments in Cognitive and Emotional Empathy as Markers of General versus Specific Personality Pathology. *Psychopathology*. 2023;1–13.
51. Luyten P, Campbell C, Allison E, Fonagy P. The Mentalizing Approach to Psychopathology: State of the Art and Future Directions. *Annu Rev Clin Psychol*. 2020;16(1):297–325.
52. Luyten P, Campbell C, Moser M, Fonagy P. The role of mentalizing in psychological interventions in adults: Systematic review and recommendations for future research. *Clin Psychol Rev*. 2024;102380.
53. Jeung H, Herpertz SC. Impairments of Interpersonal Functioning: Empathy and Intimacy in Borderline Personality Disorder. *Psychopathology*. 2014;47(4):220–34.
54. Tyrer P, Mulder R. In: *Personality Disorder: From Evidence to Understanding* [Internet]. 1. Aufl. Cambridge University Press; 2022.
<https://www.cambridge.org/core/product/identifier/9781108951685/type/book>
55. Garcia DJ, Skadberg RM, Schmidt M, Bierma S, Shorter RL, Waugh MH. It's not that Difficult: An Interrater Reliability Study of the DSM–5 Section III Alternative Model for Personality Disorders. *J Pers Assess*. 2018;100(6):612–20.

Tables

Table 1. *Dimensions of Personality Dysfunction Severity According to Personality Functioning (2), Personality Organization (19) and Personality Structure (20) Investigated in this Study (Marked in Bold).*

Personality Functioning	Personality Organization	Personality Structure
Identity	Identity	Self-perception
Sense of self with boundaries to others	Capacity to invest	Self-reflection
Stability and accuracy of self-esteem	Sense of Self	Affect differentiation
Emotional range and regulation	Representation of others	Identity
Self-Direction	Object relations	Object perception
Ability to pursue meaningful short- and long-term goals	Interpersonal Relationships	Self-object-differentiation
Constructive and prosocial internal standards of behavior	Intimate relationships and Sexuality	Whole object perception
Self-Reflective Functioning	Internal investments in others	Realistic object-perception
Empathy	Defense mechanisms	Self-regulation
Understanding and appreciation of experiences and motivations of others	Lower-level defenses	Impulse control
Tolerance of differing perspectives	Higher-Level defenses	Affect tolerance
Understanding of effects of own behavior on others	Aggression	Regulation of self esteem
Intimacy	Self-directed aggression	Regulation of object-relations
Depth and duration of connections	Other-directed aggression	Protecting relationships
Desire and capacity for closeness	Moral values	Balancing of interests
Mutuality of regard reflected in interpersonal behavior	Narcissism	Anticipation
		Internal communication
		Experiencing affects
		Use of fantasies
		Bodily self
		Communication with others
		Making contact
		Communication of affect
		Empathy
		Attachment capacity to internal objects
		Internalization
		Use of introjects (to calm or care for oneself)
		Variable attachments
		Attachment capacity to external objects
		Ability to make attachments
		Accepting help
		Severing attachments

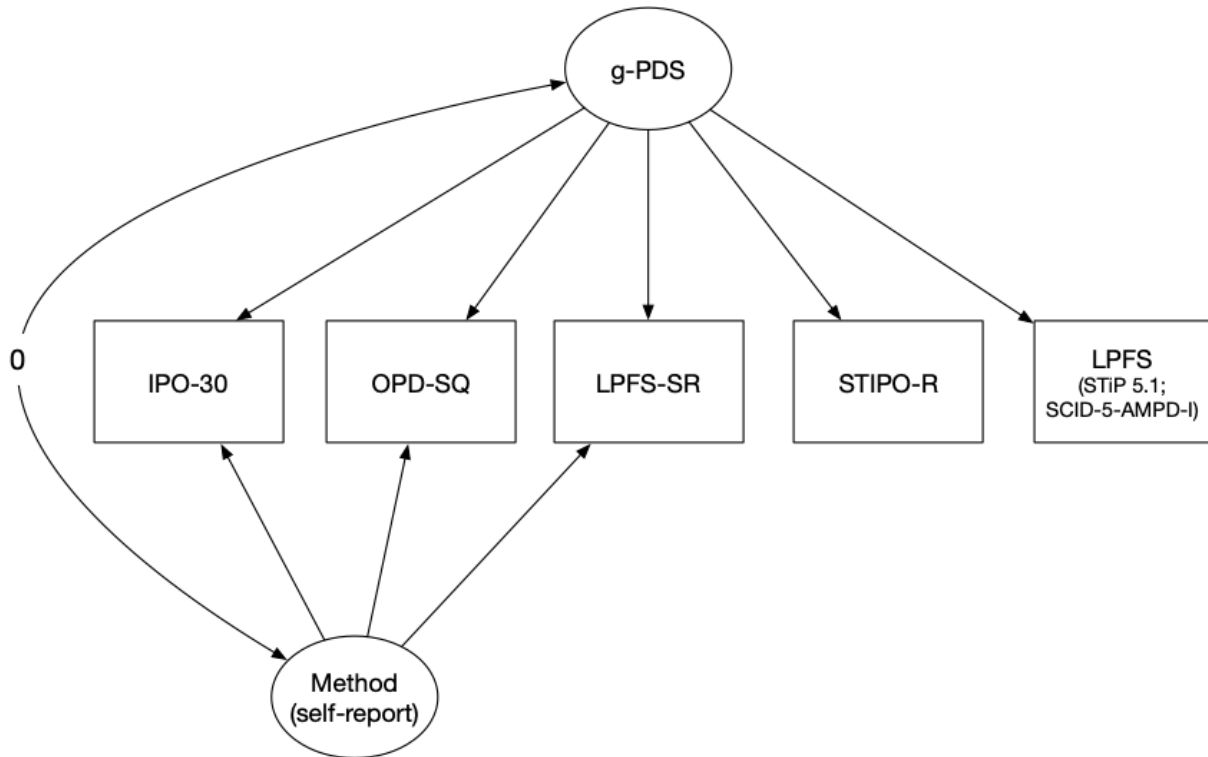
Table 2. *Correlations Between Aggregated Mean Scores of IPO-30, LPFS Interviews, LPFS-SR, OPD-SQ, and STIPO-R*

	LPFS interview	LPFS-SR	STIPO-R	IPO-30
LPFS-SR	.78			
STIPO-R	.79	.71		
IPO-30	.46	.66	.50	
OPD-SQ	.68	.78	.50	.60

Notes. Statistically significant p -values < 0.01. IPO-30 = Inventory of Personality Organization – 30 item version. LPFS Interview = Semi Structured Interview for Personality Functioning DSM-5 and Structured Clinical Interview for the Alternative DSM-5 Model for Personality Disorders – Module I. LPFS-SR = Level of Personality Functioning – Self Report. OPD-SQ = Operationalized Psychodynamic Diagnostic – Structured Questionnaire. STIPO-R = Structured Interview for Personality Organization – Revised.

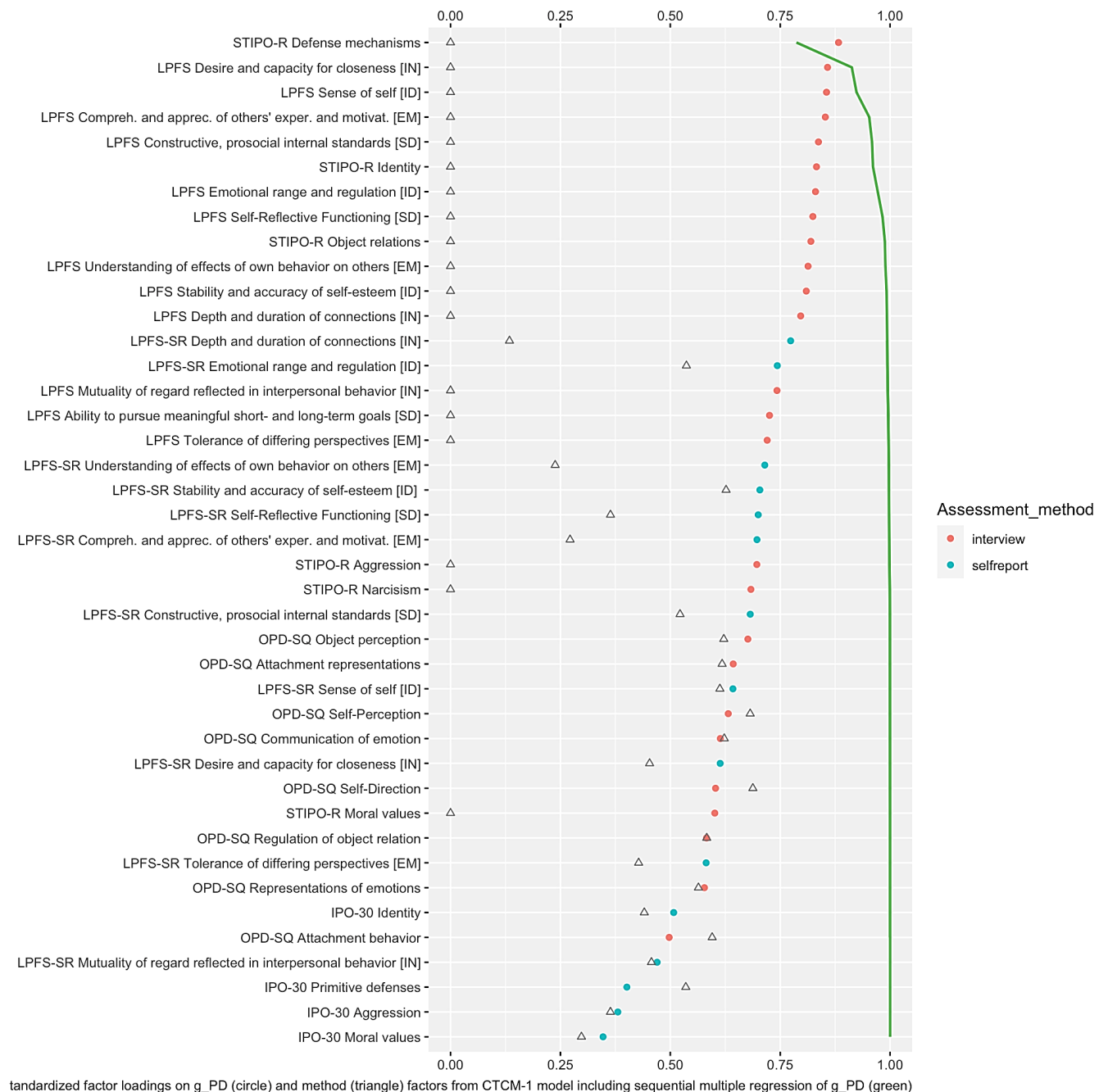
Figures

Figure 1. *Correlated Trait Correlated Method (-1) Model with a General Factor for Personality Dysfunction Severity (g-PDS) Defined by All Assessments and an Orthogonal Method Factor Defined by Self-reports*



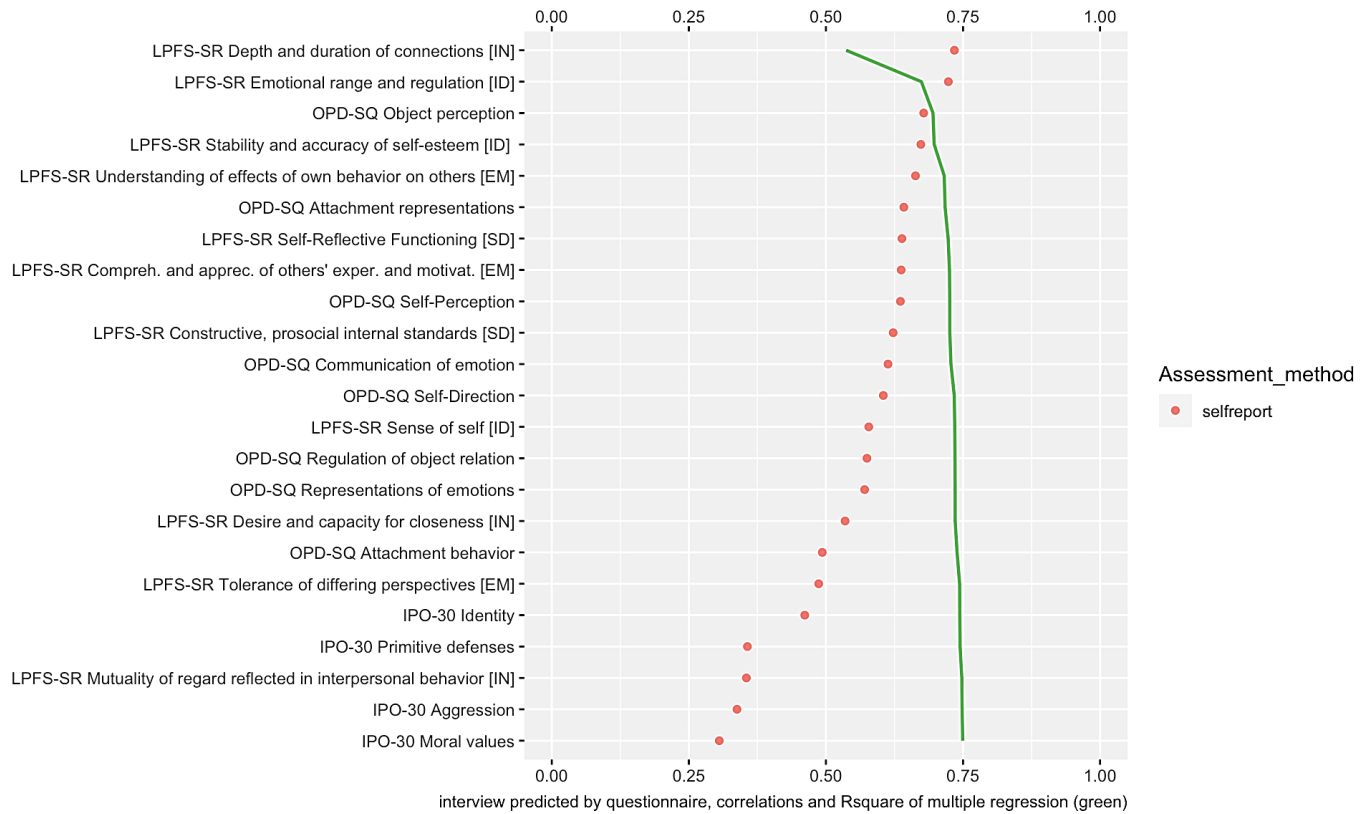
Notes. IPO = Inventory for Personality Organization, OPD-SQ = Operationalized Psychodynamic Diagnosis - Structural Questionnaire, LPFS-SR = Levels of Personality Functioning Scale - Self Report, STIPO-R = Structured Interview for Personality Organization - Revised, STiP-5.1 = Structured Interview for Personality Functioning according to DSM-5, SCID-5-AMPD-I = Structured Clinical Interview for the Level of Personality Functioning Scale.

Figure 2. Standardized Loadings of Self-reported (Red Circles) and Interview-assessed (Blue Circles) Personality Dysfunction Severity (PDS) Dimensions on Method-adjusted Latent PDS and Method (Triangles) Factors of CT-C(M-1) Model. R^2 of Sequential Multiple Linear Regressions of Manifest PDS Dimension Scores Predicting Method-adjusted Latent PDS Factor Scores.



Notes. IPO = Inventory for Personality Organization, OPD-SQ = Operationalized Psychodynamic Diagnosis - Structural Questionnaire, LPFS-SR = Levels of Personality Functioning Scale - Self Report, STIPO-R = Structured Interview for Personality Organization - Revised, LPFS = Levels of Personality Functioning based on Structured Interview for Personality Functioning according to DSM-5 or Structured Clinical Interview for the Level of Personality Functioning Scale, ID = Identity, SD = Self-direction, EM = Empathy, IN = Intimacy.

Figure 3. Correlations and R^2 of Sequential Multiple Linear Regressions of Self-Reported Personality Dysfunction Severity (PDS) Dimensions Predicting Latent Interview-based PDS Factor Scores



Notes. IPO = Inventory for Personality Organization, OPD-SQ = Operationalized Psychodynamic Diagnosis - Structural Questionnaire, LPFS-SR = Levels of Personality Functioning Scale - Self Report, ID = Identity, SD = Self-direction, EM = Empathy, IN = Intimacy.

Supplementary Material

Supplementary Table 1. Pairs of Assessments

	IPO-30	LPFS interview	LPFS-SR	OPD-SQ	STIPO-R
IPO-30	230	230	107	154	56
LPFS interview	230	285	107	163	57
LPFS-SR	107	107	107	107	54
OPD-SQ	154	163	107	163	55
STIPO-R	56	57	54	55	57

Notes. IPO-30 = Inventory of Personality Organization – 30 item version. LPFS interview = Semi Structured Interview for Personality Functioning DSM-5 and Structured Clinical Interview for the Alternative DSM-5 Model for Personality Disorders – Module I. LPFS-SR = Level of Personality Functioning – Self Report. OPD-SQ = Operationalized Psychodynamic Diagnosis – Structured Questionnaire. STIPO-R = Structured Interview for Personality Organization – Revised.

