Running Head: EVALUATION OF SASPD

A psychometric evaluation of the Standardized Assessment of Severity of Personality Disorder (SASPD) in non-clinical and clinical German samples

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Public statement

Personality disorders (PD) are prevalent, underdiagnosed and affect clinical trajectories of psychiatric patients. The SASPD has been developed as a screening tool for PD severity according to the dimensional model of the initial ICD-11 proposal. We show that the SASPD total score might be useful as an indicator for a heterogeneous mixture of PD features, but less as a unidimensional measure of PD severity.

Abstract

The Standardized Assessment of Severity of Personality Disorder (SASPD) is a nine-item self-report screening instrument and was developed to assess personality disorder (PD) severity according to the initial proposal of ICD-11. Our aim was to investigate the psychometric properties of the German version of the SASPD in non-clinical and clinical samples. A total of 1,991 participants (N = 888 from non-clinical and N = 1,103 from clinical samples) provided ratings on the SASPD as well as other measures of psychopathology and personality. We examined the SASPD regarding its factor structure, internal consistency, and construct validity. A unidimensional structure of the SASPD provided inadequate model fit, whereas a three-factor solution provided good fit in both the non-clinical and clinical samples. Internal consistency of the SASPD total score was acceptable in the clinical and in the non-clinical sample based on this multi-factorial model. In terms of convergent validity, SASPD scores correlated fairly with other measures of PD severity across samples. Discriminant validity with measures of general symptom distress and measures of (normal) personality traits was mixed. In addition, the SASPD scores predicted levels of PD severity above and beyond a measure of symptom distress. The SASPD captures some theoretically expected features of PD severity. However, the multidimensional structure and limited convergent and discriminant validity may hamper future usage of the SASPD as a short screening tool of PD severity according to ICD-11.

Keywords: Standardized Assessment of Severity of Personality Disorder (SASPD), psychometric properties, ICD-11, personality disorder severity, validation

Introduction

PDs are highly prevalent, disabling mental illnesses affecting around 12% of the general community and 40-60% of psychiatric populations (e.g., Volkert, Gablonski, & Rabung, 2018). PDs are associated with severe impairments in psychological and social functioning (Wright & Simms, 2014) as well as an increased risk for comorbid mental disorders (Coid, Yang, Tyrer, Roberts, & Ullrich, 2006). In clinical practice, however, PDs are still often overlooked and rarely diagnosed. Arguably, one reason for this is that PD assessment is overly complex and thus time-consuming (Keeley, Webb, Peterson, Roussin, & Flanagan, 2016). Therefore, accessible, easy-to-administer, and time-efficient PD screening tools are of outmost importance for applications in both clinical and research settings.

Recently, PD classification has undergone a radical change from a categorical to a dimensional system (APA, 2013; Tyrer, Mulder, Kim, & Crawford, 2019). In particular, PD classification as implemented in the International Classification of Diseases-10 (WHO, 1992) and the fifth edition of Diagnostic and Statistical Manual of Mental Disorders Section II (APA, 2013) have shown to lack clinical utility, reliability, and validity (Hengartner, Zimmermann, & Wright, 2018). In turn, new PD classification systems as implemented in ICD-11 (Tyrer et al., 2019) and DSM-5 Section III "Alternative Model of Personality Disorder" (AMPD; APA, 2013) conceptualize PDs dimensionally according to severity of impairment and maladaptive personality traits. Thus, PDs are no longer defined as categorical entities but rather on continua of personality pathology.

Although there is now consistent evidence that dimensional PD classification systems are superior to categorical ones (e.g., Zimmermann et al., 2019), there is an ongoing debate about how to best conceptualize PD severity in a dimensional system (Widiger et al., 2019). Early psychodynamic approaches (e.g., Kernberg, 1988; Operationalized Psychodynamic Diagnosis system [OPD] Task Force, 2008) suggested that PD severity is best reflected in the degree of dysfunctional mental representations of self and others. In line with this view, the

AMPD (APA, 2013) defines PD severity as the degree of impairment in the two domains of self- and interpersonal functioning. In the later released initial version of ICD-11, however, PD severity tends to be determined by the extent of the negative interpersonal consequences of maladaptive traits and the risk of harming oneself and others. This and other discrepancies to the AMPD sparked substantial opposition (Herpertz et al., 2017) and led to a revision of ICD-11's initial proposal (Reed, 2018). Correspondingly, the latest version of ICD-11 now also incorporates self and interpersonal impairments as per the AMPD (Bagby & Widiger, 2020).

However, to date there are no "gold standard" measures for PD severity according to ICD-11. As a preliminary step, Olajide et al. (2018) introduced the Standardized Assessment of Severity of Personality Disorder (SASPD), a 9-item screening tool of PD severity according ICD-11's initial proposal. The SASPD has been based on the 8-item Standardized Assessment of Personality–Abbreviated Scale (SAP-AS; Moran et al., 2003), which provides a broad dimensional indicator of the presence or absence of PD according to ICD-10 and DSM-IV, respectively. With regard to its psychometric properties, SASPD's scores have been reported to (a) accurately identify individuals with a mild or moderate PD (Olajide et al., 2018), (b) validly detect externalizing behavior (Bach & Anderson, 2018), (c) converge well with the Level of Personality Functioning Scale-Self Report (LPFS-SR, Morey, 2017; Oltmanns & Widiger, 2019), and (d) be potentially optimized by adding specific items on self- and interpersonal impairments (McCabe & Widiger, 2020). Despite these promising findings, prior studies were based on relatively small samples ($110 \leq N \leq 300$), have exclusively been conducted in English and Danish-speaking samples, and omitted examination of the SASPD's factor structure. In this paper, we aim to more comprehensively evaluate the psychometric properties of (the German version of) the SASPD in three non-clinical and three clinical samples by assessing its (a) factor structure and internal consistency, (b) convergent and discriminant validity, and (c) incremental validity.

Method

For detailed information on sample characteristics, questionnaires, and recruitment strategies for each of the six samples, we refer interested readers to the supplement materials. Prior to taking part in the study, participants gave their written informed consent, all data collected were completely anonymous and the study was conducted following the ethical principles of the World Medical Association Declaration of Helsinki (see supplemental material).

Samples

Analyses are based on three non-clinical and three clinical samples (total N = 1,991; 12.3% male; 21.24 [SD = 12.95] mean age). For all analyses but the validity tests, these samples were combined to a non-clinical sample (samples 1, 3, and 4; N = 1,103) and a clinical sample (samples 2, 5, and 6; N = 888) (see Supplemental Table S1).

Measures

Standardized Assessment of Severity of Personality Disorder (SASPD). The SASPD (Olajide et al., 2018; German version: Zimmermann & Leising, 2015) consists of nine items reflecting five maladaptive trait domains and their effects on social functioning or harm to self and others according to the initial ICD-11 proposal (i.e., 4 easily losing temper, 6 permanently worrying and 9 feeling helpless as negative affectivity; 1 avoiding others, and 3 having no friends as detachment; 2 not trusting other people and 8 being callous as dissocial; 7 being excessively organized as anankastic, and 5 acting on impulse as disinhibition). Items are rated on a 4-point scale ranging from 0 to 3.

Proxy measures of PD severity. We used the German versions of the (a) 12-item Operationalized Psychodynamic Diagnosis-Structure Questionnaire Short (OPD-SQS; Ehrenthal et al., 2015), (b) 16-item Inventory of Personality Organization (IPO-16; Zimmermann et al., 2013), and (c) 100-item Personality Inventory for DSM-5 Short Form (PID-5 SF; Maples et al., 2015) as proxy measures of PD severity.

Measures of general symptom distress. We applied the German versions of the (a) 9-item Symptom Checklist (SCL-K-9; Petrowski, Schmalbach, Kliem, Hinz, & Brähler, 2019), (b) 29-item International Classification of Diseases-10-Symptom-Rating (ISR; Tritt et al., 2008), and (c) 9-item Patient Health Questionnaire (PHQ-9; Gräfe, Zipfel, Herzog, & Löwe, 2004) as measures of general symptom distress.

Measures of personality traits. To measure (basic) personality traits, we used the German versions of the (a) 240-item NEO-Personality Inventory-Revised (NEO-PI-R; Ostendorf & Angleitner, 2004) and (b) 60-item HEXACO Personality Inventory-Revised (HEXACO-60; Moshagen, Hilbig, & Zettler, 2014).

Categorical measure of PD. The International Checklist for Personality Disorder (IDCL-P; Bronisch, Garcia-Borreguero, Flett, Wolf, & Hiller, 1992) was used to measure DSM-III-R PDs categorically.

Statistical Analyses

Factor structure and internal consistency. To investigate the latent structure of the SASPD, exploratory factor analyses (EFAs) were run separately in the non-clinical and clinical sample using Mplus 8.0 (Muthén & Muthén, 1998-2017). Parameter estimation was performed on the basis of a polychoric correlation matrix and a robust Weighted Least Squares estimator (WLSMV; Flora & Curran, 2004). To determine the number of factors, model fit was evaluated based on the χ^2 statistic, Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). In line with common standards, CFI and TLI $\geq$.95, RMSEA $\leq$ .06, and SRMR $\leq$ .08 were considered as indicating good fit to the data (Hu & Bentler, 1999). We applied both oblique and bifactor Geomin rotations to ease interpretation of results (Jennrich & Bentler, 2011). All of the following analyses were conducted using *R* (R Core Team, 2018) and the packages *psych* (Revelle, 2018) and *BifactorIndicesCalculator* (Dueber, 2020). As indicators of internal consistency, we calculated the proportion of SASPD total

score variance that can be attributed to all common factors (McDonald's Omega) and to a single common factor (OmegaH), respectively (Reise, Bonifay, & Haviland, 2013).

Convergent and discriminant validity. Since the samples differed with regard to the measures that were administered in addition to the SASPD, convergent and discriminant validity were assessed separately in each of the six samples. To establish convergent validity, we used bivariate Pearson's correlation coefficients of the SASPD total score with other proxy measures of PD severity (i.e., OPD-SQS, PID-5 SF, and IPO-16). Discriminant validity was assessed via *z*-tests (Pearson & Filon, 1898) comparing correlations between SASPD scores and proxy measures of PD severity (e.g., OPD-SQS, IPO-16 and PID-5 SF) with correlations between SASPD scores and measures of general symptom distress (SCL-K-9 and PHQ-9) and basic personality traits (NEO-PI-R and HEXACO-60).

Incremental validity. An independent-samples *t*-test was used to test for significant group differences in PD severity between patients with and without a PD diagnosis. Finally, logistic regression analyses were run to assess the ability of the SASPD total score to predict the presence of PD beyond a measure of general symptom distress in sample six.

Results and Discussion

In the following, we highlight selected findings that contribute to the current literature on the SASPD. More detailed results can be found in the supplemental materials.

Factor structure and internal consistency

Model fit of the theoretically expected one-factor model was neither adequate in the non-clinical, nor in the clinical sample. In the clinical sample, fit indices improved substantially when fitting a two-factor model. However, in both samples, a three-factor solution was the most empirically sound solution (see Table 1).

In the clinical sample, oblique rotation yielded three factors that could be labeled as Detachment, with specific loadings of item 1 (avoiding others) and item 3 (having no friends), Externalizing/Disinhibition, with specific loadings of item 4 (easily losing temper) and item 5

(acting on impulse), and Negative Affectivity, with specific loadings of item 6 (permanently worrying), item 7 (being excessively organized), and item 9 (feeling helpless). Item 2 (not trusting others) and item 8 (being callous) were less specific, showing the highest loadings on the first (Detachment) factor. In the non-clinical sample, factor loadings showed a similar but less specific pattern. The three factors correlated significantly with each other to a small to medium extent, except for a non-significant correlation between factor 1 and 2 (see Table 2).

When inspecting the factor loadings using bifactor rotation, the patterns of item loadings were less clear compared to those after oblique rotation in both the non-clinical and clinical sample. As expected, however, items loaded positively on the first general factor, except item 9 (feeling helpless) in the non-clinical sample. However, loadings on the first factor were relatively small and OmegaH indices showed that the general factor only accounted for 55% of SASPD total scores in the non-clinical sample (but at least for 70% in the clinical sample). Thus, applying a bifactor rotation suggests that the SASPD total score does not clearly reflect a single latent dimension of PD severity. This can also be seen from item 1 (avoiding others) and item 3 (having no friends) loading on additional specific factors of Detachment, and item 4 (easily losing temper) and item 5 (acting on impulse) loading on Externalization/Disinhibition (see Table 2) – similar to the oblique rotation. Yet, McDonald's Omega total indicated acceptable internal consistency of SASPD scores in the clinical (ω = 0.78) and in the non-clinical sample (ω = 0.70) being comparable to previous research (e.g., McCabe & Widiger, 2019). High levels of internal consistency when using short measures typically points towards item redundancy, thus the range of internal consistency in our samples is what is to be expected. Thus, internal consistency indices support a multi-factorial solution of the SASPD.

In general, results of factor analyses question SASPD's ability to measure PD severity as a single, overarching dimension. However, the SASPD was developed to measure PD severity according to the initial proposal of ICD-11's conceptualization of PD (Tyrer, 2015).

A possible explanation for our findings may thus lie in the inherent multidimensional nature of the SASPD because items were chosen to indicate negative consequences of maladaptive trait dimensions (Olajide et al., 2018; Oltmanns & Widiger, 2019). In support of this, we observed high factor loadings of corresponding items reflecting three of the five trait dimensions of Detachment, Externalization/Disinhibition, and Negative Affectivity. A similar three factor structure was reported for SAP-AS (e.g., Bach, Kongerslev, & Simonsen, 2019; Germans et al., 2008). In sum, the SASPD may be valuable as an index measure of specific PD characteristics but not necessarily for the assessment of PD severity as a unidimensional construct.

Convergent Validity and Discriminant Validity

Since convergent validity denotes the strength of association between two measures that are supposed to assess the same underlying construct, it requires very high intercorrelations (e.g., > .70). However, in line with previous research (e.g., Bach & Anderson, 2018; Oltmanns & Widiger, 2019), SASPD scores were only moderately correlated ($\bar{r}$ = .56) with scores of other proxy PD severity measures (i.e., IPO-16, OPD-SQS, PID-5 SF), indicating relatively low convergence (see Table 3). One of the largest associations was observed between SASPD and PID-5 SF total scores. Theoretically, this aligns with the SASPD having been developed to assess negative consequences of maladaptive personality traits. Importantly, the size of convergent correlations varied across samples, which may either be due to the heterogeneity of samples included in our study, or indicate inherent limitations of the SASPD as a valid screening tool across heterogeneous samples.

With regard to discriminant validity, correlations of SASPD scores with general symptom distress measures (i.e., SCL-K-9, PHQ-9) were relatively high (.38 < r < .68) across samples (see Supplemental Table S4). Here, z-tests indicated that associations with general symptom distress did not differ significantly in strength from associations with proxy measures of PD severity (IPO-16 total score; PID-5 SF total score), but with the OPD-SQS

total score across samples. Discriminant validity of SASPD total scores with normal personality traits, as assessed with HEXACO-60 and NEO-PI-R scale scores, was generally mixed. The strongest associations were observed between SASPD total scores and extraversion scores (NEO-PI-R*:* r = -.53; HEXACO-60: r = -.56) as well as with neuroticism scores (r = .55); these associations did not differ significantly from associations between SASPD total scores and proxy measures of PD severity across samples, indicating low discriminant validity. However, significantly lower associations were present with normal personality trait scores for agreeableness, conscientiousness, openness (HEXACO-60 & NEO-PI-R), honesty-humility, and emotionality (HEXACO-60) (see Table 3), indicating good discriminant validity. In sum, the mixed findings question the SASPD's validity as a measure of PD severity that is clearly distinct from normal personality.

Incremental Validity

An independent-samples t-test indicated that patients with a diagnosed PD scored significantly higher on the SASPD (M = 10.58, SD = 4.13) than patients without a diagnosed PD (M = 6.89, SD = 2.92, $t(178)$ = -6.29, $p < .001$), supporting the validity of the SASPD to differentiate between patients with and without a PD diagnosis. Moreover, we found the SASPD to show incremental (positive) predictive validity for the presence of PD beyond the PHQ-9 as a measure of general symptom distress ($\chi^2(1) = 19.16$, $p < .001$). However, the PHQ-9 remained a significant predictor even after controlling for the SASPD (unadjusted *OR* [per 1 SD increase] = 2.63, 95% CI [1.70; 4.27]; adjusted *OR* =1.97, 95% CI [1.23; 3.27]). This corresponds to the generally higher, disorder-specific symptom burden of patients suffering from a PD. Nonetheless, results for the SASPD's incremental validity are clinically promising, implying that the SASPD might explain unique variance in PD occurrence above and beyond symptom distress.

Limitations and Suggestions for Future Research

Our study needs to be interpreted in light of its limitations. First, all samples were based on cross-sectional data only, meaning that they remain mute on psychometric properties and clinical relevance over time (e.g., temporal invariance, implications for PD development, treatment response). Second, since we applied the German version of the SASPD, the generalizability of results to other languages/cultures is limited and needs to be addressed in future research. Lastly, while we included both non-clinical and clinical samples, the allocation to these groups and the assessment of psychological constructs varied across samples. For instance, clinical sample 2 consisted of patients who were currently receiving or had received psychotherapy in the past, without clearly established diagnoses, whereas clinical sample 6 only included patients of an inpatient setting for whom diagnoses were ascertained by IDCL-P ratings. Future studies might benefit from more consistent ascertainment of clinical status and more detailed diagnostic assessments.

Conclusion

We report the most thorough investigation of the SASPD to date with non-clinical and clinical samples. Our findings show that the SASPD does not fully adhere to a unidimensional structure, and its convergent and discriminant validity were modest. These properties might hamper accurate assessment of PD severity, so that we cannot recommend clinical use of the SASPD in its current form. However, the SASPD showed merit in terms of its incremental validity for PD assessment beyond general symptom distress. Thus, the SASPD total score might be useful as an indicator for a complex and heterogeneous mixture of PD features (Tyrer & Johnson, 1996), but probably does not reflect a coherent latent dimension of PD severity. Therefore, we recommend either a revision of the current version of the SASPD incorporating specific items on self- and interpersonal impairments as McCabe and Widiger (2019) recently suggested, or to focus on other already existing brief measures that were specifically developed to capture PD severity in terms of impairments in self- and interpersonal functioning (e.g., LPFS-BF 2.0; Bach & Hutsebaut, 2018).

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Table 1
Fit Indices of Exploratory Factor Analyses

Sample	Factors	χ^2 (*df*)	CFI	TLI	RMSEA	SRMR
non-clinical	1	231.50 (27)	.66	.55	.09	.10
non-clinical	2	100.71 (19)	.87	.75	.07	.07
non-clinical	3	68.01 (12)	.91	.72	.07	.05
clinical	1	486.71 (27)	.72	.63	.12	.10
clinical	2	129.76 (19)	.93	.87	.07	.05
clinical	3	12.66 (12)	1.00	1.00	.01	.02

Note. $N_{\text{non-clinical}} = 888$. $N_{\text{clinical}} = 1103$. CFI = Comparative Fit Index. TLI = Tucker Lewis Index. RMSEA = Root Mean Square Error of Approximation. SRMR = Standardized Root Mean Square Residual.

Table 2

Factor Rotations of the 3-Factor Model

Item Content	EFA oblique			EFA bifactor		
	F1	F2	F3	F1	F2	F3
Avoiding others	**.65/.74**	-.01/.00	-.07/-.20	**.27/.60**	**.56/**-.05	-.02/**-.34**
Not trusting others	.16/**.44**	**.72**/**.22**	.00/.02	**.71/.55**	.03/.16	-.34/-.09
Having no friends	**.63/.73**	.06/.05	.01/-.07	**.39/.69**	**.54**/.00	.00/**-.22**
Easily losing temper	.00/.03	-.25/.00	**.99/.88**	**.54/.55**	.00/**.**00	**.75**/.**70**
Acting on impulse	**-.24**/-.06	.01/.01	**.68/.70**	**.40/.36**	**-.24/.**01	**.42**/.**60**
Permanently worrying	**.24**/.02	.06/**.78**	**.17**/.00	**.31/.41**	**.19/.67**	.09/.01
Being excessively organized	**.20**/-.04	.13/**.43**	.09/.05	**.28/.21**	**.15/.37**	.00/.06
Being callous	.00/**.52**	**.34/-.22**	**.20**/.14	**.45/.48**	-.06/**-.22**	-.04/-.02
Feeling helpless	.11/.04	**-.28/.24**	**.17**/.12	-.06/**.23**	.13/**.21**	**.25**/.01
F2	.29/**.43**			OmegaH: .55/.70		
F3	**.37/.39**	**.36**/.**31**				

Note. Factor loadings and factor correlations were based on the 3-factor model solution. Loadings before the slash are based on the non-clinical sample, loadings after the slash are based on the clinical sample. EFA = Exploratory Factor Analysis. Bold = $p \leq .05$.

Table 3
Convergent validity of SASPD scores with scores of measures for PD severity, and SASPD scores discriminant validity with scores of measures for general symptom distress and general personality traits

Sample	Measures for convergent validity	*r*	Measures for discriminant validity	*r*	*t*-value
1	IPO-16 total score	.59**	SCL-K-9 score	.51**	1.66
1	OPD-SQS total score	.68**	SCL-K-9 score	(.51**)	4.18**
2	IPO-16 total score	.65**	SCL-K-9 score	.68**	-0.97
2	OPD-SQS total score	.77**	SCL-K-9 score	(.68**)	3.63**
3	PID-5 SF total score	.68**	SCL-K-9 score	.58**	1.78
3	IPO-16 total score	.55**	SCL-K-9 score	(.58**)	-0.5
4	IPO-16 total score	.33**			
4	OPD-SQS total score	.38**			
5	IPO-16 total score	.42**			
5	OPD-SQS total score	.37**			
6	OPD-SQS total score	.52**	PHQ-9 score	.38**	2.47**
3	PID-5 SF total score	(.68**)	HEXACO extraversion score	-.56**	1.77[#]
3	PID-5 SF total score	(.68**)	HEXACO agreeableness score	-.38**	3.96**[#]
3	PID-5 SF total score	(.68**)	HEXACO conscientiousness score	-.11	6.71**[#]
3	PID-5 SF total score	(.68**)	HEXACO openness score	-.12	5.95**[#]
3	PID-5 SF total score	(.68**)	HEXACO honesty-humility score	-.17*	6.75**[#]
3	PID-5 SF total score	(.68**)	HEXACO emotionality score	.14	5.68**
6	OPD-SQS total score	(.52**)	NEO-PI-R extraversion score	-.53**	-0.15[#]
6	OPD-SQS total score	(.52**)	NEO-PI-R agreeableness score	-.29**	2.69**[#]
6	OPD-SQS total score	(.52**)	NEO-PI-R conscientiousness score	-.38**	2.1*[#]
6	OPD-SQS total score	(.52**)	NEO-PI-R openness score	-.28**	2.77**[#]
6	OPD-SQS total score	(.52**)	NEO-PI-R neuroticism score	.55**	-0.57

Note. SASPD = Standardized Assessment of Severity of Personality Disorder. Proxy measures of PD severity: IPO-16 = Inventory of Personality Organization - 16-item version. OPD-SQS = Operationalized Psychodynamic Diagnosis-Structure Questionnaire Short. PID-5 SF = Personality Inventory for DSM-5 Short Form. Measures of symptom distress: SCL-K-9 = Symptom Checklist-Short-9. PHQ-9 = Patient Health Questionnaire-9. Measures of general personality traits: NEO-PI-R = NEO-Personality Inventory-Revised. *r* = Pearson correlation coefficient. Brackets indicate that the coefficient has already been reported in this column. The *t*-value describes the test statistic of the difference between two dependent correlations. [#]Scales that were expected to be negatively associated with SASPD scores were multiplied by -1 before computing the test statistic. * $p < .05$. ** $p < .01$.

Supplement Material

Samples

We used data from six German samples, including three clinical and three non-clinical samples. In all samples, participants without any responses on the SASPD were excluded from the analyses and are thus not considered here. Two samples were jointly recruited online or in clinical settings via paper-pencil (Benecke et al., 2018), and they were separated for the current analysis into (1) $n = 219$ individuals of the general population (i.e., denoting a non-clinical sample) and (2) $n = 300$ participants who were currently or had already received psychotherapeutic treatment in the past (i.e., denoting a clinical sample). One further, non-clinical sample (3) included $n = 133$ students who were recruited using mailing lists of different German universities (Thielmann, Zimmermann, Leising, & Hilbig, 2017). Additionally, participants were recruited online by self-help forums (e.g., bipolar, PTSD, borderline), social media, and advertisement at different universities as well as via online distribution of the study link by several clinical researchers. In total, 1,512 individuals were recruited via this method and completed the survey. To ensure the quality of responses and data integrity, we excluded 229 participants who were identified via bogus-items (i.e., for example, participants were asked to mark a specific response category “Please mark Sometimes or Somewhat True”), 15 participants who had response times below 20 minutes (which we deemed highly unlikely for the full survey), and 20 participants who used the same response option across 161 personality items ten or more times in a row (longstring ≥ 10). We also excluded 44 participants who were under the age of 18 years. The final sample included 1,204 participants, who were separated according to the International Classification of Diseases-10-Symptom-Rating (ISR; Tritt et al., 2008) scores in (4) a non-clinical sample with non to mild symptom distress ($n = 582$) and (5) a clinical sample with moderate to severe symptom distress ($n = 622$; Graff & Piccirilli, 2018). The sixth clinical sample (6) included $n = 181$ patients from a psychosomatic clinic, 38 of whom were diagnosed with a PD. Table S 1

provides a summary of the sample characteristics and applied measures for all six samples. Prior to taking part in the study, participants gave their written informed consent, all data collected were completely anonymous and the study was conducted following the ethical principles of the World Medical Association Declaration of Helsinki. Study 2, which included inpatients, received ethical approval by the local ethics committee of the University Kassel and in study 6, all inpatients signed an informed consent prior to participation and agreed for the data to be used for research purposes.

Measures

Across samples, we used self-report measures assessing three different constructs: (1) severity of PD, (2) severity of current symptom distress, and (3) personality trait domains.

Standardized Assessment of Severity of Personality Disorder (SASPD). The German version of the SASPD (Olajide et al., 2018) is a nine-item self-report questionnaire measuring general PD severity according to the initial proposal of ICD-11. The severity of PD is rated for each item on a 4-point scale ranging from 0 to 3. For example, item 3 (having no friends) is rated on a scale from 0 = *I have no difficulty making and keeping friends* to 3 = *I have no friends*. The psychometric properties of the scale have been shown to be mostly acceptable (Bach & Anderson, 2018; Olajide et al., 2018; Oltmanns & Widiger, 2019). The German version was translated from the original English version by Daniel Leising and Johannes Zimmermann in 2015 following common guidelines for forward and backward translation (Brislin, 1980), and it was finally approved by one of the authors of the original version (Mike Crawford).

Operationalized Psychodynamic Diagnosis-Structure Questionnaire Short (OPD-SQS). The German 12-item screening version of the OPD-SQS (Ehrenthal et al., 2015) is the brief version of the OPD-SQ (Schauenburg et al., 2012) assessing structural impairments according to the Operationalized Psychodynamic Diagnosis-2 (OPD-2; OPD Task Force, 2008). Items are answered on a 5-point Likert scale ranging from 0 = *does not apply at all* to 4 = *completely applies*. In a mixed (clinical and non-clinical) sample (N = 1,110), the OPD-SQS has been shown to yield good internal consistency with a Cronbach's alpha of .88 (Ehrenthal et al., 2015).

Inventory of Personality Organization – 16-item version (IPO-16). The German IPO-16 (Zimmermann et al., 2013) is a brief version of the IPO (Lenzenweger et al. 2001) measuring the severity of structural impairments in identity, defense, and reality testing based on Kernberg's model of personality (1988). Items are rated on a 5-point Likert scale ranging

from 1 = *does never apply* to 5 = *always applies*. In three clinical samples (*N* = 1,300), psychometric properties of the total score have been found to be in a good range with a Cronbach's alpha of .85 (Zimmermann et al., 2013).

Personality Inventory for DSM-5 Short Form (PID-5 SF). The PID-5 SF is an abbreviated 100-item self-report questionnaire (Maples-Keller et al., 2015; Zimmermann et al., 2014) of the German 220-item PID-5 (Krueger, Derringer, Markon, Watson, & Skodol, 2012) assessing maladaptive personality traits according to the AMPD of the DSM-5. Each facet is assessed with four items on a 4-point Likert scale ranging from 0 = *very false or often false* to 3 = *very true or often true*. In a clinical sample (*N* = 282), the psychometric properties of the five domain scales (i.e., negative affectivity, detachment, antagonism, disinhibition, psychoticism) have been shown to be in a good range, with Cronbach's alphas for the domain scales ranging between .80 and .88 (Díaz-Batanero, Ramírez-López, Domínguez-Salas, Fernández-Calderón, & Lozano, 2019). Total score as a proxy measure for PD severity has also been used by Bach and Anderson (2018).

Symptom Checklist-Kurz-9 (SCL-K-9). The German SCL-K-9 (Klaghofer & Brähler, 2001; Petrowski, Schmalbach, Kliem, Hinz, & Brähler, 2019) is the brief 9-item version of the Symptom Checklist (SCL-90R, Franke & Stäcker, 1995), assessing the subjective burden of psychological symptomatology on a 5-point Likert scale ranging from 0 = *not at all* to 4 = *applies extremely*. Based on a representative German survey (*N* = 2,179), this questionnaire has been found to have good psychometric properties, including a Cronbach's alpha of .87 (Klaghofer & Brähler, 2001).

International Classification of Diseases-10-Symptom-Rating (ISR). The German ISR (Tritt et al., 2008) is a self-report questionnaire assessing the severity of different psychological disorders (e.g., depression, anxiety, eating disorders) according to ICD-10. It contains 29 items which are answered on a 5-point Likert scale ranging from 0 = *does not apply* to 4 = *applies extremely*. Mean scores range from 0 to 4. A cut-off mean value of 0.5 or

less is suspected to be associated with no symptom load, a cut-off value of 0.6 with a low, a cut-off value of 0.9 with a moderate and a cut-off value of 1.7 with a severe symptom distress. In a clinical sample (N = 1,057), the psychometric properties of the ISR total score have been found to be in a good range, including a Cronbach's alpha of .92 (Fischer, Tritt, Klapp, & Fliege, 2011).

Patient Health Questionnaire-9 (PHQ-9). The PHQ-9 is a 9-item self-report questionnaire measuring the severity of depression corresponding DSM-IV criteria (Gräfe, Zipfel, Herzog, & Löwe, 2004). Items are answered on a 4-point Likert scale ranging from 0 = *not at all* to 3 = *nearly every day*. In a clinical sample (N = 6,000), the psychometric properties have been found to be in an excellent range, including a Cronbach`s alpha of .89 (Spitzer, Robert, Kroenke & Williams, 1999).

NEO-Personality Inventory-Revised (NEO-PI-R). The German version (Ostendorf & Angleitner, 2004) of the 240-item NEO-PI-R (Costa & McCrae, 1992; Costa & McCrae, 1985) measures general personality traits according to the Five Factor Model (i.e., openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism). Items are answered on a 5-point Likert scale ranging from 0 = *does not apply* to 4 = *applies completely*. Using a representative sample (N = 871), the questionnaire has been found to have good psychometric properties in terms of reliability (e.g., Cronbach's alpha for the traits ranged from .87 to .92) and validity (Ostendorf & Angleitner, 2004) .

HEXACO-60. The HEXACO-60 (Ashton & Lee, 2009; Moshagen, Hilbig, & Zettler, 2014) is the brief, 60-item version of the 200-item HEXACO Personality Inventory-Revised (HEXACO-PI-R; Lee & Ashton, 2004, 2006), assessing general personality traits according to the HEXACO model (i.e., honesty-humility, emotionality, extraversion, agreeableness, conscientiousness, and openness to experience). Items are answered on a 5-point Likert-type scale ranging from 1 = *do not agree* to 5 = *completely agree*. In a meta-analysis of the psychometric properties of (versions of) the HEXACO-PI-R, the HEXACO-60 showed

reasonably high levels of internal consistency with Cronbach's alphas ranging from .80 to .84 (Moshagen, Thielmann, Hilbig, & Zettler, in press).

International Checklist for Personality Disorder (IDCL-P). The IDCL-P is an assessment tool (Bronisch, Garcia-Borreguero, Flett, Wolf, & Hiller, 1992) measuring DSM-III-R Personality Disorders. Each PD criterion is coded with 0 = *no*, 1 = *yes*, or 99 = *probably* by clinicians. In a clinical sample ($N = 80$), the psychometric properties for the presence of PD have been reported to be acceptable, with Kappa (κ) of .62 (Bronisch et al., 1992). IDCL-P was also validated with the interview version of the questionnaire (IPDE interview), and agreement with the IDCL-P was found to be substantial with $\kappa = .75$ (Bronisch & Mombour, 1994).

Table S1
Sample characteristics

	Sociodemographic variables									Questionnaires									
	N	Age		Gender			Education			Severity of personality pathology				Symptom burden distress			Personality traits	
		M	*SD*	female	male	other	Secondary school	A-level	Other	SASPD	PID-5 SF	OPD-SQS	IPO-16	SCL-9	ISR	PHQ-9	HEXACO-60	NEO-PI-R
Sample 1 (non-clinical)	219	36.04	14.15	150	69	0	80	138	1	X		X	X	X				
Sample 2 (clinical)	300	43.65	15.05	225	75	0	90	209	1	X		X	X	X				
Sample 3 (non-clinical)	133	22.38	5.09	115	18	0	0	133	0	X	X		X	X			X	
Sample 4 (non-clinical)	582	25.94	6.37	519	22	1	n.a.			X					X			
Sample 5 (clinical)	622	24.72	5.39	521	10	1	n.a.			X					X			
Sample 6 (clinical)	181	48.76	10.32	129	52	0	n.a.			X		X				X		X

Note. SASPD = Standardized Assessment of Severity of Personality Disorder. OPD-SQS = Operationalized Psychodynamic Diagnosis-Structure Questionnaire Short. IPO-16 = Inventory of Personality Organization – 16-item version. SCL-K-9 = Symptom Checklist-Kurz-9. ISR = International Classification of Diseases-10-Symptom-Rating. PHQ-9 = Patient Health Questionnaire-9. NEO-PI-R = NEO-Personality Inventory-Revised. PID-5 SF = Personality Inventory for DSM-5 Short Form. n.a. = not assessed.

Table S2
Item Statistics of the SASPD in the combined clinical and non-clinical samples

Item	Item content	Missings		*M*		*SD*		Skewness		Kurtosis	
		Non-clinical	Clinical	Non-clinical	Clinical	Non-clinical	Clinical	Non-clinical	Clinical	Non-clinical	Clinical
1	Avoiding others	0.00 %	0.09 %	0.34	0.60	0.56	0.66	1.46	0.89	1.60	0.68
2	Not trusting others	0.23 %	0.09 %	1.12	1.33	0.80	0.84	-0.06	-0.27	-1.09	-0.91
3	Having no friends	0.11 %	0.36 %	0.66	0.92	0.87	0.96	0.77	0.43	-1.05	-1.24
4	Easily losing temper	0.11 %	0.18 %	0.26	0.56	0.53	0.77	2.03	1.23	3.98	0.69
5	Acting on impulse	0.00 %	0.18 %	0.74	0.98	0.59	0.74	0.53	0.78	1.47	0.93
6	Permanently worrying	0.00 %	0.00 %	1.16	1.74	0.78	0.85	0.21	-0.18	-0.44	-0.64
7	Being excessively organized	0.00 %	0.00 %	0.94	1.05	0.55	0.63	0.54	0.87	2.63	2.15
8	Being callous	0.00 %	0.00 %	0.17	0.22	0.58	0.65	3.93	3.28	15.28	10.31
9	Feeling helpless	0.00%	0.18 %	0.17	0.26	0.39	0.56	2.07	2.24	3.23	4.84
	Sum of all items	0.05%	0.12%	5.58	7.68	2.59	3.43	1.28	1.03	2.85	1.87

Table S3
Polychoric correlations among SASPD items in the combined non-clinical and clinical samples

Item	Non-clinical sample (N = 888)								Clinical sample (N = 1,103)							
1 Avoiding others	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
2 Not trusting others	.20								.33							
3 Having no friends	.43	.30							.50	.40						
4 Easily losing temper	.13	.11	.21						.01	.25	.23					
5 Acting on impulse	-.03	.15	.04	.54					.03	.13	.13	.60				
6 Permanently worrying	.12	.23	.19	.26	.07				.22	.33	.29	.24	.16			
7 Being excessively organized	.16	.14	.12	.12	.08	.26			.10	.15	.10	.15	.12	.33		
8 Being callous	.13	.34	.17	.23	.22	-.03	.14		.32	.27	.28	.26	.16	.02	.05	
9 Feeling helpless	.06	-.12	.06	.09	.12	.13	-.16	-.05	.08	.20	.14	.17	.15	.20	.15	.07

Table S4

Correlations of SASPD with measures of PD severity, symptom distress and (maladaptive) personality traits in the six samples.

Sample	1 non-clinical	2 clinical	3 non-clinical	4 non-clinical	5 clinical	6 clinical
IPO-16	.59**	.65**	.55**	.33**	.42**	
OPD-SQS	.68**	.77**		.38**	.37**	.52**
PID-5 SF total score			.68**			
SCL-K-9	.51**	.68**	.58**			
PHQ-9						.38**
PID-5 SF						
Negative Affectivity			.70**			
Detachment			.69**			
Antagonism			.40**			
Disinhibtion			.39**			
Psychoticism			.34**			
HEXACO-60						
Honesty			-.17*			
Emotionality			.14			
Extraversion			-.56**			
Agreeableness			-.38**			
Conscientiousness			-.11			
Openness			-.12			
NEO-PI-R						
Neuroticism						.55**
Extraversion						-.53**
Agreeableness						-.29**
Conscientiousness						-.38**
Openness						-.28**

Note. SASPD = Standardized Assessment of Severity of Personality Disorder. Proxy measures of PD severity: IPO-16 = Inventory of Personality Organization - 16-item version. OPD-SQS = Operationalized Psychodynamic Diagnosis-Structure Questionnaire Short. PID-5 SF = Personality Inventory for DSM-5 Short Form. Measures of symptom distress: SCL-K-9 = Symptom Checklist-Kurz-9; PHQ-9 = Patient Health Questionnaire-9. Measure of personality traits: NEO-PI-R = NEO-Personality Inventory-Revised. Measure of maladaptive personality traits: PID-5 SF = Personality Inventory for DSM-5 Short Form. ** $p < .001$

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