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Detecting the presence of a personality disorder using interpersonal and self-dysfunction

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Abstract

Calls have increased to place interpersonal and self-disturbance as defining features of personality disorders (PDs). Findings from a methodologically diverse set of studies suggest that a common factor undergirds all PDs. The nature of this core of PDs, however, is not clear. In the current study, interviews were completed for DSM-IV PD diagnosis and interpersonal dysfunction independently with 272 individuals (PD = 191, no-PD = 91). Specifically, we evaluated interpersonal dysfunction across social domains. In addition, we empirically assessed the structure of self-dysfunction in PDs. We found dysfunction in work and romantic domains, and unstable identity uniquely predicted variance in the presence of a PD. Using receiver operating characteristic analysis, we found that the interpersonal dysfunction and self-dysfunction scales each predicted PDs with high accuracy. In combination, the scales resulted in excellent sensitivity (.90) and specificity (.88). The results support interpersonal and self-dysfunction as general factors of PD.

Keywords

identity; self; interpersonal; criterion validity; DSM-5

A confluence of evidence underscores the lack of empirical support and clinical utility of the categorical approach of 10 personality disorders (PDs), recently carried unchanged into the DSM-5, Section 2 (Morey, Benson, Busch, & Skodol, 2015). The extensive overlap of PD diagnoses is among the most vexing problems with the model (Grant, Stinson, Dawson, Chou, & Ruan, 2005). PDs co-occur more often than not, and a high proportion of individuals with severe personality dysfunction fall outside these strict categories (Verheul & Widiger, 2006). At the same time, more support is needed for alternative models of PDs that might supplant the current approach. A major change proposed by the Personality and

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Personality Disorders Work Group for the DSM-5 (American Psychiatric Association, 2013; Bender, Morey, & Skodol, 2011), was to create a two-step diagnostic process in which presence of PD is determined – defined as moderate to severe impairment in self and interpersonal functioning (Criterion A) – followed by evaluation of the specific type of PD, based on pathological trait elevations (Criterion B). Though such a model would explain the common link among PDs and high rates of comorbidity, researchers have yet to define the commonalities among PDs.

A number of studies have provided preliminary evidence supporting an interpersonal core of PDs (Clark & Ro, 2015; Few et al., 2013; Hentschel & Livesley, 2013; Hentschel & Pukrop, 2014; Hopwood et al., 2011; Hutsebaut, Kamphuis, Feenstra, Weekers, & Saeger, 2016; Morey et al., 2011; Morey, Bender, & Skodol, 2013; Sharp et al., 2015; Zimmermann et al., 2014), and at the same time, suffer from limitations. The purpose of the current study was an attempt to examine whether interpersonal and self-dysfunction correctly classify the presence of a PD – using a design that employed a rigorous, independent assessment of interpersonal dysfunction and empirically-derived factors of self-dysfunction within a sample with high rates of Cluster B and C PD diagnoses.

PD experts have long contended that problems in realms such as identity, love and work are fundamental to the nature of PDs (Jang & Livesley, 2000; Kernberg, 1967; Rutter, 1987). Consistent with such thought, the alternative DSM-5 model defines Criterion A as moderate or worse impairment in self and interpersonal functioning. Using a variety of methods, research has generally supported self and interpersonal dysfunction as central to PDs (Berghuis, Kamphuis, & Verheul, 2012; Clark & Ro, 2015; Few et al., 2013; Hentschel & Livesley, 2013; Hentschel & Pukrop, 2014; Morey et al., 2011, 2013). For instance, Morey and colleagues (Morey et al., 2013) collected ratings from 337 community clinicians regarding personality characteristics and functioning of one identified patient, using an online survey, and found moderate sensitivity (84.6%) and specificity (72.7%) with a single rating of personality functioning predicting presence of a PD. Few and colleagues asked graduate student clinicians to assess 109 participants, who were currently receiving mental health treatment, on factors related to Criterion A and B. The authors found that general personality impairment correlated strongly with overall PD severity and other relevant variables. There are mixed findings regarding whether self and interpersonal factors are simply closely related or actually indistinguishable. Zimmerman and colleagues (2015) gathered online ratings from 145 clinicians reporting on a patient and 515 laypeople reporting on another person. The authors found evidence for two correlated, but separate factors, representing self and interpersonal functioning. In contrast, other researchers were able to construct a single psychometrically sound index of personality functioning consisting of items assessing both self and interpersonal functioning (Morey et al., 2011). It is unclear whether personality functioning should be considered a unitary or two-factor construct.

Separately, some studies have evidenced less than ideal reliability in assessment self and interpersonal functioning using interviews meant to assess self and interpersonal functioning (Few et al., 2013; Thylstrup et al., 2016; Zimmermann et al., 2014), though a recent article reported excellent interrater reliability using a new measure (Hutsebaut et al., 2016). Other limitations are also clear from the extant work, including reliance on self-report measures,

absence of standardized assessments or reliability data, lack of independence between ratings of self and interpersonal functioning and diagnoses, and use of samples with low personality pathology.

Interpersonal Dysfunction

Interpersonal dysfunction is defined as problems with Empathy and Intimacy within Criterion A. In this model, empathy refers to the ability to understand and tolerate others' experiences, recognize and tolerate differing perspectives and understand the effect of one's actions on others. Intimacy refers to wanting and developing long-term, consistent, emotionally close relationships that are reciprocal and interdependent. Empathy and intimacy represent interesting possibilities for the core dysfunction of PDs. However, this conceptualization of interpersonal dysfunction is not built upon extensive empirical work.

Relatedly, other researchers have emphasized the interpersonal aspects of personality disorders, but have come up with somewhat different models of interpersonal dysfunction in PDs (Hopwood, Wright, Ansell, & Pincus, 2013; Pincus & Wiggins, 1990). Influenced by Rutter's description of interpersonal dysfunction as the core aspect of PDs, Hill and colleagues (Hill et al., 2007) concentrated on interpersonal difficulties within the distinct social domains of work, romance, friendships and non-specific relationships (such as neighbors or people encountered in daily life). Each social domain has its own set of implicit social rules and norms, requiring intact social cognitive abilities to detect one's own deviations. For instance, the romantic domain commonly involves emotional and sexual intimacy, exclusivity, and clear delineations marking the start and end to relationships. In contrast, friendships may involve closeness and intensity, but are not sexual, exclusive or consistently marked by clear beginnings and ends. Interpersonal Dysfunction is thought to arise when a person lacks understanding and ability to organize his/her behavior within a social domain.

Self-Dysfunction

In their review documenting the development of the Level of Personality Functioning Scale (LPFS), Bender and colleagues (Bender, Morey, & Skodol, 2011) detail instruments that have been used to examine problems with self and self-in-relation to others. Though the resulting LPFS is a logical distillation of these measures, there is little empirical justification to privilege the proposed Criterion A constructs (identity and self direction) over other self-related problems. A number of constructs related to self-dysfunction have been proposed as key to understanding personality disorders (Westen, 1992; Wilkinson-Ryan & Westen, 2000), though theory has often outpaced research in this area. Self-related constructs include identity diffusion (Erikson, 1968; Kernberg, 1985), unstable identity (Wilkinson-Ryan & Westen, 2000), self-other differentiation (Piaget, 2013), accurate self-representation (Fonagy & Luyten, 2009) and self-directedness (Marcia, Waterman, Matteson, & Archer, 2012), all of which have at least some mention in the LPFS. Identity diffusion refers to an impoverished sense of self (Akhtar, 1984). Self-other differentiation is evidenced by a strong sense of a unique self and clear boundaries between self and others, shown in the ability to navigate between intimacy and separation from others (Blatt & Auerbach, 2003). Unstable identity refers to incoherence in thought, feeling and behavior (Wilkinson-Ryan & Westen,

2000), such as contradictory, mood-dependent mental states, inconsistency between self-concept and behavior or fluctuations in identity over time. Self-directedness refers to clarity on short and long term goals, morals and values, evidenced by life and career goals and steps taken to accomplish these goals (Bender, Morey, & Skodol, 2011). Accurate self-representation is the ability to make meaning of internal experience, such as emotions, mental states, and influences on behavior. It is not yet clear, however, whether each of these variables characterize PDs generally and which may be best suited for differentiating PDs from other mental health problems. Examining a broad group of constructs is needed to derive an empirically supported definition of interpersonal and self-dysfunction in PDs.

Current Study

In the current study, we examined the criterion validity of interpersonal and self-dysfunction as central variables underlying the presence and severity of PDs. We measured interpersonal dysfunction independently from PD diagnosis, using an interview measure. We did not attempt to define interpersonal and self-dysfunction according to the approach specifically delineated in the alternative section of the DSM-5. Rather, we focused on a conceptual, rather than literal interpretation of Criterion A; we utilized a well-established measure of interpersonal dysfunction, and sought to determine empirically the nature of self-disturbance related to PDs, at least in sample with high rates of cluster B and C diagnoses. Because little empirical work has been done to assess the structure of self-dysfunction in PDs generally, we employed a factor-analytic approach to define our measure of self-dysfunction. We examined which aspects of interpersonal and self-measures explained unique variance, beyond psychiatric symptom measures, in predicting the presence and severity of PD. To determine the value of interpersonal dysfunction and self-dysfunction as predictors of PD, we used receiver operating characteristics (ROC) analyses to determine the sensitivity, specificity and area under the curve of these measures.

Method

Participants

The final sample ($N = 272$) consisted of individuals recruited from psychiatric outpatient clinics and the community across two separate research protocols. We enrolled participants in the first protocol ($n = 123$) from three groups: individuals with BPD, individuals with another PD, and those without a PD. In the second protocol ($n = 150$), participants were screened according to three strata derived from the McLean Screening Instrument (MSI-BPD; Zanarini et al., 2003): 0–2, 3–4, and five or more BPD symptoms. Psychiatric patients ($n = 197$ across both protocols; 72.4%) were recruited from general adult outpatient psychiatric clinics and were receiving treatment. The remaining participants ($n = 75$; 27.6%) represented a demographically representative community sample recruited through random digit telephone dialing within the catchment area by the University Center for Social and Urban Research at the University of Pittsburgh. For both protocols, participants with psychotic disorders, organic mental disorders, severe developmental disability, and major medical illnesses that influence the central nervous system were excluded.

Recruitment efforts resulted in a sample with high rates of PD (66%, $n = 191$) and current DSM-IV Axis I disorders (81%, $n = 220$). Frequencies of PD diagnoses were as follows: paranoid ($n = 11$), schizoid ($n = 6$), schizotypal ($n = 4$), histrionic ($n = 11$), narcissistic ($n = 25$), antisocial ($n = 22$), borderline ($n = 85$), avoidant ($n = 65$), dependent ($n = 14$), obsessive compulsive ($n = 26$) and PD NOS ($n = 34$). Substantial psychopathology was evident in both the psychiatric and community samples (likely reflecting a bias for individuals with mental health problems to enter a psychiatric study). For instance, only 18 of the 75 community participants did not have a current or past Axis I disorder. In addition, 42 psychiatric participants were not diagnosed with a PD, insuring variability within each sample and good coverage of all levels of severity. Previous publications provide additional information regarding these specific samples (Hill et al., 2011; Scott, Stepp, & Pilkonis, 2014).

Participants were between 21 and 61 years of age ($M = 41.5$; $SD = 11.04$). A majority of the sample was female ($n = 187$; 69.0%). Participants primarily identified as White ($n = 180$; 66.2%) or Black ($n = 81$; 30.1%), and remaining participants identified as more than one race ($n = 8$; 2.9%) or Asian ($n = 2$; 0.7%). Seven participants (2.6%) identified their ethnicity as Hispanic. Although 76.1% ($n = 206$) of the sample obtained education beyond high school, the economic disadvantage among participants was high: 59.9% ($n = 163$) of the sample was unemployed and/or receiving disability.

Measures

Consensus PD diagnosis and severity—During at least four sessions, participants completed a self-report battery and four clinical interviews. The first interviews focused on the assessment of Axis I disorders using the Structured Clinical Interview for DSM Disorders (SCID; First, Spitzer, & Williams, 1997) and the Structured Interview for DSM-IV Personality (SIDP-IV; Pfohl, Blum, & Zimmerman). In the third interview, a thorough social and developmental history was collected using the Interpersonal Relations Assessment (Heape, Pilkonis, Lambert, & Proietti, 1989). Finally, information regarding participants' behavior across several domains of functioning was gathered through the Revised Adult Personality Functioning Assessment (RAPFA; Hill, Harrington, Fudge, Rutter, & Pickles, 1989). In order to evaluate interpersonal dysfunction separately from PD symptoms, the RAPFA was conducted independently from other interviews. Specifically, each participant was assigned two primary interviewers with separate case conference teams, one for the RAPFA and one for the remaining three clinical interviews. During each case conference, interviewers presented all information from the assessment(s) to three or more judges, and final ratings were made via consensus (Pilkonis, Heape, Pilkonis, Lambert, & Proietti, 1989).

All interviews were conducted by trained research staff with a minimum of a master's degree in social work or clinical psychology and had at least five years of assessment/clinical experience. The University of Pittsburgh Institutional Review Board approved all study procedures, and participants provided informed, voluntary, written consent before enrollment.

During case conference, interviewers presented - to three or more judges - participants' developmental history as determined via the Interpersonal Relations Assessment (IRA;

Pilkonis et al., 1989) and responses to the SCID Axis I interview (Spitzer, First, & Williams, 1997) and SIDP-IV (Zimmerman, Blum, & Pfohl, 1997) PD interview, as well as interviewers' impressions. This information was used to determine PD and DSM-IV Axis I diagnoses by consensus. Judges agreed on PD symptoms and diagnoses, and PD severity using a PD severity scale (below). A total of fifteen cases were rated by five or more raters to assess reliability of PD diagnoses. Intraclass correlation (ICC; case 2, 1 from Shrout & Fleiss, 1979) on the current samples demonstrated high reliability for PD dimensional scores (ICC = .78).

Clinical severity scores were also derived from this consensus meeting. The Global Assessment of Functioning scale (GAF; Endicott, Spitzer, Fleiss, & Cohen, 1976) was used to evaluate functioning in three domains over the past month: symptoms, occupational and social functioning. Scores range from 0 to 100; higher scores indicate superior functioning, whereas lower scores denote impairment. The inter-rater reliability was $\alpha = .92$ for the psychiatric symptoms, the only scale used in the current study. The consensus group also rated PD severity using a 100-point PD Severity Scale (Morse & Pilkonis, 2007). This scale was based on the GAF in that it considers degree of impairment as a result of PD symptoms and social and occupational functioning based on the SCID-I and SIDP-IV. Interrater reliability for PD severity scale, based on 15 cases, was high (ICC = .86).

Interpersonal dysfunction—The Adult Personality Functioning Assessment (APFA; Hill, Harrington, Fudge, Rutter, & Pickles, 1989) and revised version (RAPFA; Hill et al., 2007) were influenced by Rutter's (Rutter, 1987) thinking that interpersonal dysfunction defines PDs. The semi-structured, clinician-rated interview focuses on assessing interpersonal dysfunction within specific social domains, which include work, romance, friendship and non-specific relationships (e.g., neighbors, sales interactions) over the past five years. Based on an interview with the participant, clinicians rated on self-directedness and quality of relationships in the work domain; development and depth of intimacy in the romantic domain; development of supportive and healthy friendships within the friendship domain; and ability to navigate basic societal relationships with neighbors, sales people, and others within the non-specific interpersonal domain. Severity of dysfunction is also rated within each domain. Ratings for each domain are made on a nine-point scale, where '1' reflects no dysfunction and '9' reflects very poor functioning. Ten cases were selected at random and rated by an average of seven judges. The ICCs were .90 for work, .87 for romantic relationships, .82 for friendships, and .75 for non-specific relationships.

Self-dysfunction—We developed empirically derived factors of self-dysfunction based on measures available across two large assessment batteries. Our item search was partly informed by a previous factor analysis of one of the samples, in which we identified factors representing self-other differentiation, identity diffusion and mentalization (Beeney et al., 2015). For the current study, we conducted an expansive search within two large assessment batteries and identified items available across the two samples that measured any aspect of self-dysfunction. In our search we sought to identify any items that assessed identity diffusion (impoverished identity), problems with self-reflection, unstable identity, self-other differentiation, mentalization, brittle/affectively volatile character, grandiosity, unstable self-

esteem, or negative self-concept. Items identified for the current study are presented in Table 1. Items were drawn from measures including items assessing self-other boundaries from the Inventory of Interpersonal Problems (IIP; Horowitz, Rosenberg, Baer, Ureño, & Villaseñor, 1988), mood dependent and impoverished self from the Hierarchy of Attachment Organization (HAO; Beeney et al., 2016), good sense of self and dependent self from Adult Attachment Ratings (AAR; Pilkonis, Kim, Yu, & Morse, 2014), mentalization consistent with Fonagy and colleagues' (Fonagy, Steele, Steele, & Moran, 1991) account from Kobaks Q-sort, and items focused on lack of character and exploitative character from the Alternative Aspects measure (Pilkonis, n.d.).

Brief Symptom Inventory—The Brief Symptom Inventory (BSI; Derogatis, 1993) is a self-report measure that assesses psychological distress and psychopathology over the past week. The BSI includes nine specific symptom scales and a global severity index (GSI). We used the GSI to control for participant-reported psychiatric symptoms. In the current sample, the internal consistency of the GSI was high ($\alpha = .96$).

Results

Measurement Model of Self-Dysfunction

Table 1 shows a summary of the initial 24 items identified that matched the criteria above. Two datasets from our group were used to develop this measurement model. The first dataset included 123 participants (detailed in the methods section). Using this sample, we ran an exploratory factor analysis (EFA, principal factor analysis using maximum likelihood estimation and promax rotation) on the entire pool of 24 items. The EFA was run in Mplus 7.1 and all other analyses were run in the R, including the confirmatory factor analysis, analyzed using the lavaan package (Rosseel, 2012). A scree plot suggested a three-factor solution. We also ran a parallel analysis, another approach for determining the number of factors to retain for factor analysis, which suggested a maximum of 4 factors. We ran the EFA using both three- and four-factor solutions. The four-factor solution yielded two factors with a correlation greater than .8. Because of this high correlation, we retained the three-factor solution. The initial EFA with three factors yielded adequate fit indices, although several items evidenced high cross loadings or loadings of less than .40 on any factor. Four items from the Inventory of Interpersonal Problems (IIP) and one item from the Adult Attachment Ratings (AAR) measuring lack of identity due to dependency did not load adequately onto any factor. Items with high cross loadings were impoverished mental states from the Hierarchy of Attachment Organization (HAO), two items assessing a strong sense of self from the secure attachment factor of the AAR, and maladaptive personality style from the Alternative Aspects (AA) measure. These nine items were removed, and the EFA was re-run. Factor indices from this EFA generally indicated a good fit: CFI = .99, TLI = .97, RMSR = .03, RMSEA = .05, though the χ^2 test was significant $p = .007$.

In order to validate this three-factor solution in an additional sample, we ran a confirmatory factor analysis (CFA) with a second sample of 150 participants. Fit indices indicated the CFA provided good fit to the data: CFI = .96, TLI = .95, SRMR = .06, RMSEA = .06, though again the χ^2 test was significant $p < .001$. Next, we re-ran this CFA with all

participants for whom complete data were available ($n = 262$) which again yielded comparable fit indices. The three factors reflected (a) self-report of difficulties with boundaries between self and others, (b) clinician-rated items assessing mentalization, (c) clinician-rated items focused on unstable identity, including both impoverished and unstable identity and mental states. Self-other boundaries and mentalization were almost identical to factors identified in our previous study (Beeney et al., 2015). Unstable identity was conceptually similar to a third factor of identity diffusion identified in the previous study, though the items from this latter factor were not available across both samples. Derived factor scores were then used in subsequent analyses as the measure of self-dysfunction. Factors, items and factor loadings are listed in Table 2.

Mean interpersonal dysfunction and associations between self and interpersonal factors

A box-and-whisker plot (Figure 1) depicts that participants diagnosed with a PD ($n = 191$) evidenced higher dysfunction across all social domains ($t_s > 5$; all p -values $< .001$) compared to participants with no-PD ($n = 91$). Participants diagnosed with a PD also evidenced greater problems with self-other boundaries, unstable identity, and poorer mentalization ($t_s > 8$; all p -values $< .001$ (no figure shown). Inter-correlations among all interpersonal and self-dysfunction variables and PD severity are displayed in Table 3.

Criterion validity of interpersonal and self-dysfunction for PD and PD Severity

Interpersonal dysfunction—Our primary aim was to examine how well interpersonal- and self-dysfunction predicted PD and PD severity, both separately and in combination. To test this, we ran logistic and multiple regressions and plotted receiver operating characteristic (ROC) curves. In a logistic regression, we used RAPFA scores in the domains of work, romantic, friendship, and non-specific social domains as predictors of PD, a binary variable (yes or no) indicating the presence or absence of PD derived from consensus diagnosis. Work, romantic and friendship dysfunction all predicted unique variance in PD status ($z_s > 2.2$, p -values $< .05$), whereas non-specific interpersonal dysfunction did not. We entered the same variables as predictors of PD severity in a multiple ordinary least squares (OLS) regression and the same three variables significantly predicted PD severity and accounted for 56% of the variance.

We ran additional models (see Table 4), in which we included clinician assessment of psychiatric symptoms using GAF symptom scores, and self-report symptoms using the BSI general severity index. We chose these measures both to examine which variables predicted PD status and severity over and above psychiatric symptoms and to attempt to control for method variance. In addition, we sought to control for depression, anxiety and general distress, which could also affect interpersonal and self-functioning. Results from these models are shown in Table 4. With symptom measures in the model, work and friendship remained significant predictors of PD status and work and romantic domain dysfunction remained significant predictors of PD severity.

Self-dysfunction—Next, we tested the relationship of self-other differentiation, mentalization and unstable identity from our CFA model with PD diagnosis and PD severity. In two separate models predicting presence of PD and PD severity, all three self-dysfunction

measures were unique predictors ($z_s > 2.6$, p -values $< .05$). The three self variables predicted 64% of the variance in PD severity. When adding symptom measures to predict presence of PD, only unstable identity remained a significant predictor over and above the two symptom measures. For the model predicting PD severity, when including symptom measures, both unstable identity and mentalization remained significant predictors.

Combined models—To compare the predictive validity of self and interpersonal dysfunction for PD status and PD severity, we included both sets of variables alongside psychiatric symptom measures. In models predicting presence of PD, work dysfunction, self-other differentiation and unstable identity uniquely predicted PD diagnosis. With symptom measures in the model, work dysfunction and unstable identity were the only unique predictors. In predicting PD severity, without symptom measures in the model, work and romantic dysfunction and all three self-dysfunction measures were predictors of unique variance ($z_s > 2.94$, $p < .005$) and the total model predicted 76% of the variance in severity. With symptom measures in the model, work dysfunction, romantic dysfunction, mentalization and unstable identity predicted unique variance.

Receiver Operating Characteristic (ROC) curves—ROC analysis is an approach to examine the ability of criterion variables to correctly classify participants on a dependent, frequently binary, variable. We sought to identify cutoffs for the maximum sensitivity and specificity values. Curves for interpersonal dysfunction, self-dysfunction and their combination are presented in Figure 2. Area under the curve (AUC) ranges from zero to one and is used in ROC models to compare model prediction accuracy. Significance of the difference between the AUC of different ROC models can be compared statistically. Interpersonal dysfunction variables combined to correctly classify participants with PD diagnoses at .81 sensitivity and .81 specificity. The positive predictive value (PPV) was .89 and the negative predictive value (NPV) was .69. Work dysfunction and romantic dysfunction were the two most useful variables for determining presence or absence of a PD. AUC analysis with all RAPFA interpersonal domains as predictors revealed a value of .88 (95% Confidence Interval: .83–.92), which was a significantly greater AUC than any single interpersonal domain (e.g., work; $z_s > 2.96$, $p < .01$).

Self-dysfunction variables combined to correctly classify presence or absence of a PD with .76 sensitivity and .97 specificity, yielding an AUC of .94 (95% Confidence Interval: .91–.96). The PPV was .98 and NPV was .67. Unstable identity was the best predictor from this group – the AUC for unstable identity was not significantly different from the combined model. The combination of interpersonal and self-dysfunction further increased accuracy of prediction, with .90 sensitivity and .89 specificity, yielding an AUC of .96 (95% Confidence Interval: .94–.98). The AUC of the combined model was significantly higher than the self-dysfunction ($z = 2.51$, $p = .012$) or interpersonal dysfunction ($z = 4.37$, $p < .001$) models alone. The PPV for the combined model was .94 and the NPV was .79.

Discussion

We sought to examine the proposition emphasized in theory (Livesley, Jang, & Vernon, 1998) and the alternative DSM-5 model, that the presence of a PD can be correctly classified

through assessment of interpersonal and self-dysfunction alone. Within a large sample with extensive PD pathology (though more cluster B and C pathology than Cluster A), we found support for the criterion validity of interpersonal and self-dysfunction as indicators of the presence of a PD; classification even exceeded previous reports that relied on self-report (Morey et al., 2011) and non-independent clinician measures of Criterion A-related constructs (Morey et al., 2013). Using the RAPFA, an interview of interpersonal dysfunction, conducted independently from assessment of PD diagnosis, we found our indicators of work and romantic dysfunction accurately predicted the presence and absence of a PD in our sample. Among variables assessing self-dysfunction, unstable identity was the most accurate predictor. However, interpersonal and self-dysfunction measures in combination provided the most accurate classification of presence of a PD, exceeding the predictive value of either domain alone. Though other studies have examined classification of the presence of a PD using interpersonal and/or self-disturbance criteria, this study is the first to demonstrate accurate classification using a rigorous assessment of interpersonal functioning derived independently from diagnosis.

Many theorists have posited that interpersonal dysfunction is a primary indicator of PD (Rutter, 1987). Based on ROC curve analyses, which identify the maximum sensitivity and specificity in predicting a dependent variable, interpersonal dysfunction demonstrated high sensitivity (.81) and specificity (.81). The implication of these results is that when clinicians rate interpersonal functioning, this may alone be sufficient to indicate the presence or absence of a PD, particularly with the use of multiple-item inventories and a structured interview. Though this finding is most consistent with Rutter's (Rutter, 1987) position that PDs are best understood as disorders of interpersonal dysfunction, the result is also consistent with other theoretical proposals (Hopwood, Wright, Ansell, & Pincus, 2013b) and complements research regarding interpersonal dysfunction as the core of PDs (Morey et al., 2011; Sharp et al., 2015).

Research on self-dysfunction in PDs is scarce. Therefore, we used an empirical approach for our assessment of self-dysfunction. With this approach, we found a factor structure that resembles parts of the self-dysfunction construct defined in Criterion A. One factor, self-other differentiation is explicitly described as part of the Identity aspect of Self-Functioning on Criterion A. Bender and colleagues (Bender, Morey, & Skodol, 2011) describe a second factor, mentalization, in their manuscript explaining their rationale for Criterion A, as a key ability linked to the regulation of the self. The construct is also represented in the alternative DSM-5 model spanning both aspects of self and interpersonal dysfunction, including adequate self-reflection, quality of self-representation, and understanding of the motivations for others' behavior and the effects of one's own behavior on others. Our third factor, unstable identity, represented several aspects of identity disturbance that have been reported in the theoretical literature (Gunderson & Lyons-Ruth, 2008) and some empirical work (Beeney et al., 2016; Wilkinson-Ryan & Westen, 2000). Unstable identity is not explicitly part of the definition of Self on Criterion A, though it is included in the description of self-difficulties specific to BPD. Researchers have often suggested that such features may underpin all PDs. For instance, Kernberg (1985) conceptualized all severe personality disorders as having borderline personality organization, which he defined as possessing a fragmented sense of self and tendency toward thinking about self and others as "all good" or

“all bad”. Kernberg’s view, and the current research, is consistent with research that has found, using bi-factor models, that BPD symptoms do not load onto any specific factor, but load only on a general factor (Sharp et al., 2015; Wright, Hopwood, Skodol, & Morey, 2016). At the same time, each of these studies, and the current study, have utilized samples that include more full representation of Clusters B and C personality disorders, compared to Cluster A. A different structure of self-dysfunction could be found within a sample including high rates of schizoid, schizotypal and paranoid PD symptoms. In total, though we did not seek to explicitly test the specifics of self-dysfunction as defined by Criterion A, many of our findings are consistent with its definition.

As with interpersonal dysfunction, self-dysfunction predicted presence of PD with high accuracy, though this was almost wholly due to the predictive value of unstable identity. Though both self-other differentiation and mentalization were unique predictors of the presence of PD when considered in a logistic regression without symptom variables, their moderate overlap with unstable identity and the better predictive power of unstable identity limited their influence in the combined models. Self-dysfunction has seldom been studied among PDs generally (Wilkinson-Ryan & Westen, 2000), or even among specific PDs. The current findings broadly support the role of self-dysfunction in PDs proposed within Criterion A. Additionally, both mentalization and unstable identity explained unique variance in PD severity. This was true even after controlling for both self-report and clinician ratings of general symptoms, suggesting, like interpersonal dysfunction, self-dysfunction may index PD severity.

Though we did not attempt a literal test of the LPFS, our measures of self and interpersonal functioning overlapped considerably with the LPFS and potentially demonstrate constructs most useful for indicating the presence and severity of a PD. Empathy and intimacy are the LPFS facets comprising interpersonal function. There is likely a large amount of overlap between these facets and mentalization and romantic functioning. Empathy has been described as an aspect of the larger construct of mentalization (Choi-Kain & Gunderson, 2008). The ability to form intimate bonds, and engage in close, caring, mutually beneficial relationships overlaps, to a large degree, with romantic functioning on the RAPFA. Identity and Self-Direction are the LPFS facets comprising self-function. Identity in the LPFS includes problems with self-other differentiation, identity diffusion, self-reflection, emotion regulation, and emotional stability. Derived from our empirical investigation of self-dysfunction, mentalization is likely to overlap considerably with self-reflection and perhaps identity diffusion, whereas unstable identity captures aspects of emotion regulation and emotional stability. Self-other differentiation, though not explicitly identified within the LPFS, is largely similar within both approaches. Self-directedness is a major component of work functioning on the RAPFA. We should note, that though both the LPFS and the RAPFA assess aspects of social cognition and behavior, the RAPFA has a greater emphasis on behavior. In addition, at the same time as we appear to cover the LPFS well, our results suggest that Work Functioning and Unstable Identity were the best predictors of the presence of a PD, and these two constructs plus Mentalization were the best predictors of PD severity. Given Work Functioning could be understood as a problem of Self-Directedness (self-function on the LPFS), this result mirrors Zimmerman and

colleagues (2014) finding that self-directedness and unstable identity performed better than interpersonal functioning in this regard. Still additional research is needed in this realm.

Design choices allowed us to assess interpersonal dysfunction independently from self-dysfunction. This permitted the analysis of associations between aspects of both types of difficulties and the ability of each to predict PD. Interrelationships between factors of interpersonal and self-dysfunction ranged from small-to-large. Work dysfunction was moderately-to-strongly associated with indices of self-dysfunction. Within Criterion A, one of the aspects of self-dysfunction is self-directedness, which includes ability to make and carry out short and long term career goals. Perhaps supporting dysfunction in the work domain as an aspect of self-functioning, we found work function and unstable identity were strongly correlated. However, we also found a similar association between unstable identity and romantic domain functioning, which is intended to measure ability to develop and maintain intimate and mutually beneficial romantic relationships. These strong associations may suggest a complex, reciprocal relationship between interpersonal and self-dysfunction. Interpersonal and attachment theorists have long argued that a strong sense of self is developed from interactions with others; we learn about ourselves through the mirror others provide to us (Target, Fonagy, Gergely, & Jurist, 2002). Erikson's (1968) theory of identity development details identity as arising from interpersonal interactions (particularly with caregivers) and necessarily intertwined with development in career, romance and friendships. Given these accounts of the interrelationship between self and interpersonal development, and our current findings, it is likely that self and interpersonal problems frequently coexist. More research is needed to understand what aspects of self most impact interpersonal functioning and whether assessment of distinct self and interpersonal problems is redundant or synergistic.

It is important to note that the current study utilizes the DSM-IV-TR categorical diagnoses as both an indicator of the presence of a PD, and the "gold standard" with which to evaluate an alternative model. This is paradoxical, given the categorical system is simultaneously being critiqued as deficient, and used to validate an empirically-based approach. This paradox is not unique to the present study, and the field has yet to generate a less contradictory alternative. As the field transitions to a new diagnostic approach, and greater support for this approach is developed, the categorical diagnoses will likely not need to be used as a tool for validation.

Strengths and Limitations

The current study builds upon recent research focused on core features of PDs. We sought to overcome the limitations of several studies, which have utilized samples with only minor problems in personality functioning. In addition, rather than using self-report measures alone, our study employed clinician and self-report assessment. This design insured that interpersonal dysfunction was evaluated by a clinician unaware of details about the patient over and above those directly relevant to interpersonal dysfunction. A limitation of the study is that assessment of self-functioning was done by evaluators who were aware of other features of the participant, including PD diagnosis. However, design choices may have made this limitation more minor. We controlled for both clinician-rated and self-reported

psychiatric symptoms to account for general mental health problems as well as same-method variance. In addition, self-functioning was assessed using many different measures, including both self-report and clinician-rated measures and the strength of correlations were not necessarily method-dependent. Two of the measures using different methods (unstable identity and self-other differentiation) were highly associated, whereas another, conceptually more distant pair, (mentalization and self-other differentiation) were not, supporting discriminant validity of the constructs. Despite these efforts, the high predictive power of self-dysfunction found in the current study should be considered as more tentative compared to findings regarding interpersonal dysfunction. Still, future studies should employ a multitrait-multimethod framework (Eid et al., 2008), which could more capably distinguish construct and method variance. Because the IRA interview focuses on relationships throughout the lifetime and informed PD diagnosis, it is possible this interview could inflate the relationship between PD diagnosis and the RAPFA. In addition, the recruitment efforts for the two samples used were focused on recruitment of individuals with BPD, although one sample included sampling individuals with another PD. This sampling feature could influence our findings and lead to identifying more BPD-specific findings, particularly related to self-factors. However, as reported, our sample evidenced high rates of psychopathology, particularly across clusters B and C. In fact, 106 participants (36% of the total sample) had a personality disorder, but not BPD. Despite this, it is likely wise to consider the self factors derived from the current sample as preliminary. Much more research is needed to identify the nature of identity problems in PDs, particularly given the low number of participants with Cluster A diagnoses.

Conclusion

Theoretical accounts promoting interpersonal and self-dysfunction as core difficulties of all PDs have generally been more prominent than empirical investigations. The DSM-5 alternative model has brought greater focus to this hypothesis. The current study provides additional support for interpersonal and self-dysfunction as a common core of PDs. The current results suggest that interpersonal and self-dysfunction are accurate predictors of the presence of PD and useful indicators for the severity of personality dysfunction.

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Figure 1. Severity of domain dysfunction for participants diagnosed with and without a personality disorder.
Note. Revised Adults Personality Functioning (RAPFA) scores range from 1–9.

Figure 2.

Receiver Operating Curve Analyses: Interpersonal and Self Dysfunction

Note. All models are based on logistic regression analyses predicting presence of PD. AUC = Area under the curve.

Table 1

Items assessing aspects of identity

Construct	Measure	Aspect Assessed
Mentalization: ability to understand the behavior of self and others in terms of intentional mental states.	Attachment Q-sort (Kobak, 1989)	Influence of relationships on relationship, influence of parental mental states on children, opaqueness of mental states
Unstable and/or mood dependent identity: mood-dependent oscillations in mental states; tendency toward extremes in interpreting self and others; identity characterized by volatility or severe inflexibility.	Adult Attachment Ratings (AAR; Pilkonis, Kim, Yu & Morse, 2013)	Inability to integrate positive and negative feelings; black and white thinking
	Hierarchy of Attachment Organization (HAO; Beeney, et al., 2015)	Items assessing multiple, mood-dependent mental states
	Alternative Aspects (AA; Pilkonis, unpublished)	Bad character expressed by cruel, exploitative behavior; maladaptive character style expressed by lack of flexibility, heightened defensiveness.
Self-Other Differentiation: boundaries between self and other in which individual can maintain individuality inside close, emotional relationships, without being overwhelmed by the thoughts and feelings of others.	Inventory of Interpersonal Problems (IIP; Horowitz, Rosenberg, Baer, Ureno, & Villaseñor, 1988)	Items assessing difficulties with emotional and cognitive contagion; difficulty spending time alone; difficulties feeling like separate person; tendency to be too open with others
	Adult Attachment Ratings (Pilkonis, Kim, Yu & Morse, 2013)	Difficulty establishing self outside of relationships (due to dependency needs)
Identity Diffusion: lack of definition in terms of self, evident in difficulty expressing a rich or coherent and consistent identity. Feelings of emptiness or lack of authenticity are often believed to be expression of identity diffusion.	Alternative Aspects (AA; Pilkonis, unpublished)	Lack of character: self characterized by poor tolerance of relatively minor stressors
	Adult Attachment Ratings (Pilkonis, Kim, Yu & Morse, 2013)	Good sense of identity; ability to maintain clear sense of self and value others
	Hierarchy of Attachment Organization (HAO; Beeney, et al., 2015)	Inadequate/impoverished mental states; lack of psychological curiosity

Table 2

Factor loadings of self-related items

EFA Factor Loadings	1	2	3
Self-Other Differentiation			
IIP36 – Hard for me to feel separate from others	.49	.05	.12
IIP66 – Affected too much by other's moods	.79	.11	.14
IIP69 – I am too gullible	.65	–.14	–.13
IIP74 – Influenced too much by others	.82	.03	.03
IIP87 – Affected too much by other's misery	.68	.06	.07
Unstable Identity			
AA – lack of character, poor tolerance for minor stresses	.14	.53	–.19
AA – bad character, cruelty, exploitative	–.21	.59	–.01
HAO – multiple, mood dependent mental states	.00	.86	.16
AAR-Ambivalence3 – Inability to integrate positive and negative feelings	.07	.55	–.12
AAR-Ambivalence10 – all-or-none, black and white thinking	.10	.63	.00
Mentalization			
Q-sort12 – Acknowledges limitations in view of parents	.04	–.09	.66
Q-sort29 – Presents objective picture of relationship influences	.03	.07	.92
Q-sort62 – Understands parents' limitations in light of own experience	.06	.06	.90
Q-sort65 – Able to discuss the influence of relationships on relationships	–.04	.00	.88

Note. All bold items significant at $p < .001$. IIP = Inventory of Interpersonal Problems; AA = Alternative Aspects; HAO = Hierarchy of Attachment Organization; AAR = Adult Attachment Ratings; Q-sort = Kobak's Attachment Q-sort.

Table 3

Correlations between interpersonal- and self-dysfunction variables

	1	2	3	4	5	6	7
1. Self-Other Differentiation							
2. Mentalization	-.20 ***						
3. Unstable Identity	.63 ***	-.56 ***					
4. Work	.25 ***	-.35 ***	.51 ***				
5. Romantic	.29 ***	-.33 ***	.47 ***	.49 ***			
6. Friendship	.16 **	-.08	.23 ***	.19 **	.20 **		
7. Non-specific	.07	-.14 *	.17 **	.06	.12 *	.04	
8. PD Severity	.54 ***	-.53 ***	.79 ***	.65 ***	.61 ***	.23 ***	.16 **

Note.

* $p < .05$,

**

$p < .01$,

$p < .001$.

1–3 are factors derived from the CFA described within. 4–7 are RAPFA domain severity scores.

Table 4

Regression Analyses: Interpersonal and Self-Dysfunction Predicting Unique Variance in PD and PD Severity

Interpersonal	PD Diagnosis			PD Severity		
	Est.	Std. Error	t-value	Est.	Std. Error	Z-value
GAS Symptoms	-0.14	.04	-3.83 ***	-0.66	0.07	-11.06 ***
BSI Global Severity	0.28	.34	0.81	1.16	0.77	2.41 *
Work Domain	0.46	0.12	3.86 ***	1.72	0.28	6.23 ***
Romantic Domain	0.21	0.14	1.57	1.69	0.30	5.67 ***
Friendship Domain	0.25	0.13	1.97 *	0.11	0.08	1.42
Non-specific Domain	0.04	0.07	0.56	0.08	0.07	1.12
Self						
GAS Symptoms	-0.13	0.04	-3.80 ***	-0.57	0.05	-11.07 ***
BSI Global Severity	0.42	0.42	1.02	1.84	0.76	2.41 *
S-O Differentiation	0.04	0.62	0.60	-0.47	1.18	-0.69
Mentalization	-0.63	0.41	-1.53	-2.96	0.75	-3.92 ***
Unstable Identity	4.08	0.80	5.07 ***	6.54	0.95	6.69 ***

Note.

* $p < .05$,

** $p < .01$,

*** $p < .001$.

Significant negative correlations reflect the healthier functioning (fewer GAS Symptoms and better mentalization) that is negatively associated with PD diagnosis.

GAS = global assessment scale; BSI = brief symptom inventory; Depression = Hamilton Depression Inventory Score; S-O = Self-Other. In interpersonal model without simultaneously estimating symptom variables, work, romantic and friendship RAPFA scores all significant. In interpersonal model without symptom variables, the same self-variables are significant.