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Interpersonal Problems across Levels of the Psychopathology Hierarchy

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Abstract

We examined the relationship between psychopathology and interpersonal problems in a sample of 825 clinical and community participants. Sixteen psychiatric diagnoses and five transdiagnostic dimensions were examined in relation to self-reported interpersonal problems. The structural summary method was used with the Inventory of Interpersonal Problems Circumplex Scales to examine interpersonal problem profiles for each diagnosis and dimension. We built a structural model of mental disorders including factors corresponding to detachment (avoidant personality, social phobia, major depression), internalizing (dependent personality, borderline personality, panic disorder, posttraumatic stress, major depression), disinhibition (antisocial personality, drug dependence, alcohol dependence, borderline personality), dominance (histrionic personality, narcissistic personality, paranoid personality), and compulsivity (obsessive-compulsive personality). All dimensions showed good interpersonal prototypicality (e.g., detachment was defined by a socially avoidant/nonassertive interpersonal profile) except for internalizing, which was diffusely associated with elevated interpersonal distress. The findings for individual disorders were largely consistent with the dimension that each disorder loaded on, with the exception of the internalizing and dominance disorders, which were interpersonally heterogeneous. These results

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replicate previous findings and provide novel insights into social dysfunction in psychopathology by wedding the power of hierarchical (i.e., dimensional) modeling and interpersonal circumplex assessment.

Keywords

internalizing; externalizing; psychopathology hierarchy; transdiagnostic dimensions; interpersonal problems; interpersonal circumplex

Introduction

Interpersonal interactions are at the heart of humanity's most critical endeavors. Indeed, human evolution has been driven in large part by selective pressures (e.g., threats and opportunities) associated with communal living (Chisholm, 1988; Neuberg et al., 2010). Therefore, it is no surprise that the ability to navigate social interactions in an appropriately flexible and goal-directed manner is a major component of psychological health. To the extent that individuals struggle to adapt to changes in the interpersonal environment (e.g., struggle to behave assertively when it is necessary to protect their interests or to forgive a transgression to preserve an important relationship), they are likely to experience thwarted goals, strained relationships, and psychological distress (Horowitz, 2004). Moreover, interpersonal functioning has been shown to have complex, bidirectional relationships with various forms of psychopathology. For instance, depressed individuals contribute through their behavior (e.g., lack of assertiveness and social withdrawal) to stressful interpersonal circumstances that may overwhelm their coping abilities and lead to vicious cycles of interpersonal stress and further depression (Hammen, 2006; Liu and Alloy, 2010). Similar processes are likely to occur for other disorders as well (e.g., Daley et al., 2000).

Interpersonal theory emphasizes the importance of interpersonal functioning, and theorists working within this tradition have developed the interpersonal circumplex (IPC) to organize the ways in which interpersonal functioning can be characterized (Wiggins, 1991). The IPC is a circular model that has been empirically supported by research into interpersonal traits, problems, sensitivities, values, messages, strengths, and behaviors (Pincus and Ansell, 2013). It is formed by the intersection of two bipolar dimensions (see Figure 1). Agency is the vertical dimension and describes a range of interpersonal functioning, from assertiveness to passivity, that is relevant to negotiating social hierarchies. Assertiveness manifests in displays of power, mastery, and dominance, whereas passivity manifests in displays of inaction, deference, and submission. Communion is the horizontal dimension and describes a range of interpersonal functioning, from affiliation to separation, that is relevant to negotiating social distance. Affiliation manifests in displays of solidarity, intimacy, and union, whereas separation manifests in displays of remoteness, disaffiliation, and hostility. The poles of each dimension in the IPC represent pure forms of assertiveness, passivity, affiliation, and separation, whereas the remaining space represents blends of agency and communion. The geometric properties of the IPC are such that interpersonal qualities closest to one another are the most similar conceptually and statistically.

A sizeable literature has used the Inventory of Interpersonal Problems Circumplex Scales (IIP-C) (Alden et al., 1990; Horowitz et al., 2000) to examine how interpersonal problems related to agency and communion are associated with psychiatric disorders. It yields eight subscale scores corresponding to octants of the IPC (see Figure 1). The pattern of associations between a profile of subscale scores and a measure of psychopathology (e.g., a diagnosis or symptom count) can be parsimoniously represented using the Structural Summary Method (Gurtman, 1992). This technique will be described in detail in a later section, but in brief, a profile of scores can be represented by its interpersonal style (i.e., the type of interpersonal problems it is most associated with), its elevation (i.e., the extent to which all subscales are high), and its distinctiveness (i.e., the extent to which a single subscale is high relative to the others). This method also quantifies the interpersonal prototypicality of a profile (i.e., the extent to which it has a reliable interpersonal style and distinctiveness).

The relationship between interpersonal problems and the personality disorders has received considerable research attention. A recent meta-analysis by Wilson et al. (2017), including effect sizes from 127 relevant studies, found that paranoid, schizoid, schizotypal, antisocial, borderline, histrionic, narcissistic, and avoidant personality disorders had good prototypicality, although borderline personality disorder was relatively less prototypical than the others. Dependent and obsessive-compulsive personality disorders, on the other hand, did not have even adequate prototypicality; as such, only their elevation can be interpreted. Narcissistic personality disorder had a domineering style, antisocial personality disorder had a vindictive and domineering style, paranoid and borderline personality disorders had a vindictive style, schizoid and schizotypal personality disorders had a cold style, avoidant personality disorder had a socially avoidant style, and histrionic personality disorder had an intrusive and domineering style. All of the profiles summarized above had marked interpersonal distinctiveness, although antisocial and narcissistic personality disorders had relatively more distinctiveness than the others, and schizotypal and borderline personality disorders had relatively less. Finally, all of the personality disorders (including dependent and obsessive-compulsive) had marked elevation and were therefore associated with generalized interpersonal distress. However, avoidant, borderline, and dependent personality disorders were relatively more elevated, and antisocial and schizoid personality disorders were relatively less elevated.

The relationship between interpersonal problems and syndromal disorders has typically been investigated one disorder at a time. Due to methodological and reporting limitations of many of these studies, conclusions regarding profile descriptors are difficult to draw. In general, these studies suggest that major depressive disorder has a nonassertive and socially avoidant style (Barrett and Barber, 2007; Dinger et al., 2015; Grosse Holtforth et al., 2014; Locke et al., 2016; Quilty et al., 2013; Stangier et al., 2006), social phobia has a nonassertive style (Cain et al., 2010; Kachin et al., 2001; Stangier et al., 2006), and generalized anxiety disorder has an exploitable style (Przeworski et al., 2011; Salzer et al., 2008, 2011). These disorders also seem to have marked elevation. However, many of these studies found evidence of interpersonal heterogeneity within their samples, i.e., they identified subgroups of participants with each disorder that had significantly different profiles. Some authors have interpreted this heterogeneity as evidence of the influence of *comorbidity* (e.g., Barrett and

Barber, 2007) such that a disorder gives rise to different problems depending on which other disorders are also present. Other authors have interpreted it as evidence of *pathoplasticity* (Widiger et al., 1999) in which personality traits influence the expression of interpersonal problems in the context of a given disorder.

Research on other syndromal disorders is sparser but suggests that schizophrenia-related disorders (Johansen et al., 2013) and obsessive-compulsive disorder (Grisham et al., 2008; Solem et al., 2015) may have nonassertive and exploitable styles, that posttraumatic stress disorder may have a socially avoidant style (Jepsen et al., 2009) or be interpersonally heterogeneous Thomas et al. (2014a), and that panic disorder (Zilcha-Mano et al., 2015) and bulimia nervosa (Hopwood et al., 2007; Ambwani and Hopwood, 2009) may be interpersonally heterogeneous. Research on interpersonal problems in substance use disorders (Mueller et al., 2009; Kornreich et al., 2002; Doumas et al., 2007; Weinryb et al., 1996; Hassel et al., 2013) is difficult to interpret due to methodological limitations (e.g., using the non-circumplex version of the IIP or reporting quadrant scores rather than octant scores).

When considering both personality and syndromal disorders, there are three main limitations of the interpersonal problems literature. First, whereas some disorders have been examined in multiple samples and with multiple measures, others have not been extensively examined. The findings for these disorders (e.g., panic disorder and posttraumatic stress disorder) need to be clarified and replicated. Second, although some studies examined multiple personality disorders in the same sample, very few studies have done this with multiple syndromal disorders, and no studies have yet examined the interpersonal problems associated with multiple personality and syndromal disorders in the same sample. Without such comparison, the specificity of interpersonal problems for a diagnosis cannot be evaluated. Lastly, the vast majority of studies have measured psychopathology using categorical diagnoses; however, there is growing evidence that disorders are not wholly distinct but rather are organized around transdiagnostic dimensions or spectra (Kotov et al., 2017).

Quantitative modeling of covariation (i.e., comorbidity) among syndromal disorders has converged in suggesting two broad spectra of common mental disorders (Eaton et al., 2011; Krueger et al., 1998). The *internalizing* dimension accounts for the comorbidity among affective disorders (e.g., depressive, anxiety, and posttraumatic stress disorders), whereas the *externalizing* dimension accounts for the comorbidity among disinhibitory disorders (e.g., conduct, attention-deficit-hyperactivity, and substance use disorders). There is also clear evidence for a *thought disorder* dimension, which captures comorbidity among schizophrenia-related disorders and mood disorders with psychosis (Kotov et al., 2011a; Keyes et al., 2013).

More recently, studies have investigated the joint structure of syndromal and personality disorders (Wright and Simms, 2015; Markon, 2010; Røysamb et al., 2011; Kotov et al., 2011b). These studies have found that some personality disorders fit well into the syndromal structural models (e.g., schizotypal personality disorder on the thought disorder dimension and antisocial personality disorder on the externalizing dimension), whereas other personality disorders form additional dimensions. Specifically, comorbidity between the

avoidant and schizoid personality disorders is captured by a *detachment* dimension and comorbidity between the narcissistic, histrionic, and paranoid personality disorders is captured by an *antagonism* dimension. There is also evidence that some disorders cross-load on multiple dimensions, such as borderline personality disorder on internalizing and externalizing (Eaton et al., 2011; Røysamb et al., 2011) and bipolar disorder on internalizing and thought disorder (Goldberg et al., 2009; Keyes et al., 2013).

Given the empirical support for a dimensional model of psychopathology, there is a need to study the relationship between interpersonal problems and transdiagnostic dimensions. Currently, the nature of this relationship is largely unknown. One possibility is that, by explaining covariation among diagnoses largely defined by intrapersonal symptoms, some dimensions may be related to a mixture of interpersonal styles. In this case, the dimensions would show interpersonal heterogeneity and would be characterized by low prototypicality and distinctiveness. Another possibility is that some diagnoses may covary in terms of both intra-personal and interpersonal symptoms (e.g., disorders and interpersonal problems may influence each other or share etiological factors). In this case, the dimensions would show interpersonal homogeneity and would be characterized by high prototypicality and distinctiveness.

To our knowledge, only two studies have examined these possibilities; both used the dimensional scales of the Personality Inventory for DSM-5 (PID-5; Krueger et al., 2012). This inventory is a self-report scale that was developed to measure the 25 traits and five higher-order dimensions described in the alternative DSM-5 model for personality disorders (American Psychiatric Association, 2013); these five dimensions are analogous to those described above, albeit with different labels (i.e., internalizing was termed “negative affectivity,” externalizing was termed “disinhibition,” and thought disorder was termed “psychoticism”).

In a sample of undergraduate students, Wright et al. (2012) found that all five dimensions had good interpersonal prototypicality and marked elevation, and that all dimensions except thought disorder had marked distinctiveness. In a sample of recent psychiatric patients, Williams and Simms (2016) found that all dimensions except internalizing had good interpersonal prototypicality, all had marked elevation, and that detachment and antagonism had marked distinctiveness. In both studies, externalizing and thought disorder were associated with a vindictive style, detachment with a socially avoidant style, and antagonism with a domineering style. Additionally, in the student sample, internalizing was associated with an overly nurturant style (its style could not be identified in the patient sample due to its low prototypicality). These results are quite consistent across samples and suggest that transdiagnostic dimensions may be capturing joint covariation between intra-personal and interpersonal symptoms. However, it is important to replicate these findings in a clinical sample that includes careful assessment of psychopathology and differential diagnosis via diagnostic interview, as self-report methods are often inadequate for capturing the stability, longevity, and clinical significance of symptoms and are more likely to be influenced by the reporting biases and impaired insight that may accompany certain forms of psychopathology (Wilson et al., 2017).

The current study contributes to the psychopathology and interpersonal theory literature by examining and comparing the interpersonal problems associated with sixteen carefully diagnosed syndromal and personality disorders, a larger group of disorders than those studied in previous research. Furthermore, it adopts a hierarchical model of psychopathology. Hierarchical models are powerful because they explicate psychopathology at the level of transdiagnostic dimensions, which account for covariation among diagnoses, as well as provide results for individual diagnoses, which allow for comparison with past research and may account for unique variance not explained by the dimensions. Thus, this hierarchical approach can reveal the interpersonal problems associated with both transdiagnostic dimensions and specific disorders.

On the basis of theory and previous research, we propose three hypotheses: (1) a hierarchical model of psychopathology similar to that found in previous research will be replicated in our sample; (2) previous associations between psychopathology and interpersonal problems will be replicated in our sample; and (3) whereas many individual diagnoses will be associated with interpersonal heterogeneity, the transdiagnostic dimensions will consolidate this heterogeneity into clearer interpersonal signals.

Methods

Participants

A total of 825 participants who completed diagnostic interviews and the IIP-C were drawn from five related subsamples (each corresponding to consecutive iterations of the same parent grant, which focused on the assessment and longitudinal observation of psychiatric patients with personality disorders and members of relevant comparison groups, e.g., patients without personality disorders and untreated members of the community, with and without psychiatric diagnoses). The overall sample included a combination of both outpatient and community participants (63.3 % female, 76.5 % white, average age 36.2 years old). Table 1 provides demographic and methodological information about each subsample.

Psychiatric patients were recruited from outpatient clinics at Western Psychiatric Institute and Clinic, and community participants were recruited through advertising, telephone solicitation using random-digit dialing, and mailings to staff and faculty at the University of Pittsburgh. Potential participants were excluded if they had a lifetime history of a psychotic disorder or suffered from a medical condition that compromised the central nervous system. In the fifth subsample, bipolar disorder was also an exclusion criterion.

Measures

Inventory of Interpersonal Problems (IIP-C)—The IIP-C (Alden et al., 1990; Horowitz et al., 2000) is a self-report measure of interpersonal problems. It was designed to have circumplex properties, and its 64 items are assigned to eight octant subscales corresponding to points around the IPC model (Figure 1). Items correspond to interpersonal excesses (i.e., behaviors that “you do too much”) and inhibitions (i.e., behaviors that are “hard for you to do”). Each item is rated on a 5-point scale from “not at all” to “extremely.” As recommended by Gurtman (1994), subscale scores were standardized relative to a

normative group using z-score transformations and population norms provided by Horowitz et al. (2000). Averaged across all subsamples, internal consistency (i.e., Cronbach alpha) for the subscales was .76 (domineering), .77 (vindictive), .83 (cold), .88 (socially avoidant), .90 (nonassertive), .83 (exploitable), .84 (overly nurturant), and .76 (intrusive).

Psychodiagnostic Assessment—In the first four subsamples, participants were assigned diagnoses using the "LEAD standard" (Spitzer, 1983). LEAD is an acronym for "Longitudinal, Expert, and All Data," and it requires diagnosticians who have demonstrated their reliability to come to a consensus based on data from all available sources (including structured diagnostic interviews with participants, their own firsthand experiences, and collateral data from other informants such as significant others and other mental health professionals). Each case was presented at a diagnostic conference, where all available information was reviewed and discussed by at least three members of the research team until a consensus was developed regarding diagnoses. Participants in the first subsample were assessed using DSM-III-R criteria, whereas participants in all other subsamples were assessed using DSM-IV criteria. Consensus diagnoses were not yet available for the fifth subsample, so the diagnoses assigned by the primary clinician (following a structured interview) were used instead.

Data Analyses

Confirmatory Factor Analysis (CFA)—CFA was used to build a hierarchical model of covariation among psychiatric disorders commonly diagnosed in clinical and epidemiological samples (i.e., those affecting more than 5 % of our sample). We decided a *priori* to collapse all substance use disorders into two categories: alcohol dependence and drug dependence. Table 2 presents the current (not lifetime) prevalence rates and gender ratios for each diagnosis.

After examining the pattern of associations among included diagnoses, and consulting relevant literature about the structure of psychopathology (Eaton et al., 2011; Krueger et al., 1998; Wright and Simms, 2015; Markon, 2010; Røysamb et al., 2011; Kotov et al., 2011b; Keyes et al., 2013; Kotov et al., 2011a), we built a CFA model with five factors. The individual diagnoses were grouped into the following factors: (1) social phobia and avoidant personality disorder; (2) posttraumatic stress disorder, major depression, panic disorder, borderline personality disorder, dependent personality disorder, generalized anxiety, and dysthymia; (3) antisocial personality disorder, borderline personality disorder, alcohol dependence, and drug dependence; (4) histrionic, narcissistic, and paranoid personality disorders; and (5) obsessive-compulsive personality disorder.

The CFA analyses were conducted using the lavaan package for R (Rosseel, 2012). All diagnostic categories were entered into the CFA models as binary variables, and the WLSMV estimator was used (see the supplemental materials for more details). The fit indices used for model evaluation were the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), and the root mean squared error of approximation (RMSEA). Values of CFI and TLI greater than or equal to .90 indicate acceptable fit, whereas values approaching or greater than .95 indicate excellent fit; values of RMSEA less than .08 indicate good fit,

whereas values less than .05 indicate excellent fit (Hu and Bentler, 1999). We planned to examine model fit and, if it were deemed inadequate, to explore the pattern of factor loadings and modification indices. We decided *a priori* to add any cross-loadings that were theoretically defensible and would improve model fit (i.e., modification index > 5), as well as to remove from the model any diagnoses that had weak factor loadings (i.e., $\lambda < .3$).

Structural Summary Method (SSM)—To evaluate the nature of the interpersonal problems associated with each diagnostic category and psychopathology factor, we used the SSM (Gurtman, 1992; Zimmermann and Wright, 2017). This method was chosen over alternatives, such as interpreting correlations with individual subscales or collapsing octant scores into quadrant scores, because it provides a parsimonious account of the results while still preserving much of information about different aspects of each profile. The SSM is based on the circular pattern of associations among variables comprising a circumplex inventory (e.g., the IIP-C subscales) and quantifies the extent to which correlations with an external variable (e.g., a diagnosis or factor score) conform to that same pattern. Specifically, the expected pattern of correlations should follow a sinusoidal wave, which can be represented by the equation:

$$r_i^p = e + a\left(\cos\left(\theta_i - \delta\right)\right) \quad (1)$$

where r_i^p is a construct's predicted correlation with octant *i*, given that *e* is the elevation of the curve (i.e., the average correlation across all octants), *a* is the amplitude of the curve (i.e., the distance between the average correlation and the peak correlation), θ_i is the angle of octant *i,* and δ is the angular displacement of the peak of the curve from 0° (Figure 2). In this context, elevation can be interpreted as a profile's association with generalized interpersonal distress, amplitude can be interpreted as the distinctiveness of a profile, and angular displacement can be interpreted as the predominant interpersonal style of a profile (Gurtman, 1992). Amplitude and angular displacement, but not elevation, are only interpretable when the observed profile has adequate prototypicality (i.e., goodness-of-fit to the sinusoidal wave pattern, as quantified by R^2; Wright et al., 2009).

SSM parameters were estimated in the current study using the ssm package for R (Zimmermann and Wright, 2017), which uses resampling methods to derive confidence intervals. Following previous work in this area (Zimmermann and Wright, 2017; Wright et al., 2012), we interpret prototypicality scores of .70 or higher as “adequate” and prototypicality scores of .80 or higher as “good;” we also interpret elevation and amplitude scores with absolute values less than .15 as “modest” and absolute values of .15 or higher as “marked.”

Results

The initial CFA model did not have adequate fit to the data. Its RMSEA (0.04) was excellent, but its CFI (0.87) and TLI (0.84) did not meet the threshold for acceptability. To improve the initial model, we trimmed two indicators that had low factor loadings.

Specifically, we removed generalized anxiety disorder (which had a factor loading of 0.24) and dysthymic disorder (which had a factor loading of 0.17). We also allowed major depressive disorder to cross-load on the detachment factor. This revised model had better fit to the data and was retained for further analysis[1]. Its RMSEA (0.03) was excellent and its CFI (0.93) and TLI (0.91) were acceptable. The revised model and its standardized parameter estimates are depicted in Figure 3.

Factor scores for each participant were then extracted from the revised model and used to examine the relationship between psychopathology and interpersonal problems. Associations between factor scores and the IIP-C subscales were uniformly positive but varied considerably (Table 3), ranging from $r = .02$ between domineering problems and the compulsivity factor to $r = .59$ between socially avoidant problems and the detachment factor. The largest correlations for the detachment and compulsivity factors were with the subscales that capture problems related to passivity and separation, whereas the largest correlations for the disinhibition and dominance factors were with the subscales that capture problems related to excessive assertiveness. The internalizing factor had a pattern of correlations that was elevated across all subscales.

When examined using the SSM, all factors except for the internalizing factor had good interpersonal prototypicality. Thus, the SSM parameters provide a useful summary of the observed correlations for the detachment, disinhibition, dominance, and compulsivity factors, but only the elevation parameter is interpretable for the internalizing factor. Table 5 presents the SSM parameters and confidence intervals (as well as their projections on the agency and communion dimensions). Disinhibition and dominance had a domineering style, detachment had a socially avoidant and nonassertive style, and compulsivity had a nonassertive style. The profiles for detachment, disinhibition, and compulsivity had marked distinctiveness, whereas dominance did not. Finally, all five factors had marked elevation (i.e., generalized interpersonal distress), although detachment and internalizing were relatively more elevated.

Tables 4 and 6 present the correlations and SSM parameters for each individual diagnosis, and figures 5 to 9 depict their interpersonal locations (grouped by factor). Due to the large number of diagnoses and structural summary parameters, we report results in general terms and encourage interested readers to consult Table 6 for further details.

The diagnoses loading on the detachment factor (i.e., avoidant personality disorder, social phobia, and major depression) all showed adequate prototypicality and had a socially avoidant or nonassertive style. They all had marked elevation, but only avoidant personality disorder had a profile with marked distinctiveness.

The diagnoses loading on the internalizing factor (i.e., dependent and borderline personality disorders, panic disorder, posttraumatic stress, and major depression) were interpersonally

[1]The same model was fit to the data excluding subsample 1 (DSM-III-R) as well as to the data excluding subsample 5 (non-LEAD). One parameter was changed in the model excluding subsample 1 (i.e., borderline personality disorder needed a negative loading on the detachment factor to avoid a Heywood case); its fit indices were RMSEA, 0.03, CFI, 0.95, TLI, 0.92. No parameters were changed in the model excluding subsample 5; its fit indices were RMSEA, 0.03, CFI, 0.95, TLI, 0.93.

heterogeneous. All of the disorders except posttraumatic stress disorder showed adequate prototypicality. These disorders had quite different interpersonal styles: major depression and panic disorder had a nonassertive style, borderline personality disorder had a domineering style, and dependent personality disorder had an exploitable style. None of these disorders had a profile with marked distinctiveness, but all of them were markedly elevated. In contrast, posttraumatic stress disorder was only modestly elevated.

The diagnoses loading on the disinhibition factor (i.e., antisocial personality disorder, drug dependence, alcohol dependence, and borderline personality disorder) all showed good prototypicality and were associated with a domineering style. Only antisocial personality disorder had a profile with marked distinctiveness and only borderline personality disorder was markedly elevated.

The diagnoses loading on the dominance factor (i.e., histrionic, narcissistic, and paranoid personality disorders) all showed good prototypicality. However, they had quite different interpersonal styles: histrionic personality disorder had an intrusive style, narcissistic personality disorder had a domineering style, and paranoid personality disorder had a vindictive style. None of these disorders had a profile with marked distinctiveness and none of them were markedly elevated.

Lastly, the profile for obsessive-compulsive personality disorder had good prototypicality, modest distinctiveness, and modest elevation. Differences between obsessive-compulsive personality disorder and the compulsivity factor score result from the fact that factor scores are continuous, model-based estimates of an individual's standing on a latent dimension whereas diagnoses are dichotomous, observed variables.

Discussion

The current study examined the relationship between psychopathology and interpersonal functioning in a large and carefully diagnosed sample. Specifically, we tested three hypotheses: (1) a dimensional model of psychopathology similar to that found in previous research would be replicated, (2) previous associations between interpersonal problems and psychopathology (i.e., transdiagnostic dimensions, personality disorders, and syndromal disorders) would be replicated, and (3) transdiagnostic dimensions would be more interpersonally homogeneous than individual disorders.

Structure of Psychopathology

In line with our first hypothesis, we were able to account for the covariation in diagnoses using a factor analytical model similar to those found in previous studies of the joint structure of syndromal and personality disorders (Røysamb et al., 2011; Kotov et al., 2011b; Wright and Simms, 2015). This model showed adequate fit to the data and contained five factors.

The first factor had loadings from avoidant personality disorder, social phobia, and major depression (in descending order of magnitude). The symptom areas that overlap between these disorders capture social inhibition, fears of negative evaluation, and feelings of

inferiority. This factor is conceptually similar to the *detachment* dimensions found in previous studies, although the exclusion of schizoid personality disorder from our analyses (due to its low prevalence in the sample) results in this factor representing detachment due more to fear and anxiety than to disinterest and indifference.

The second factor had as indicators dependent personality disorder, borderline personality disorder, panic disorder, posttraumatic stress, and major depression. The symptom areas that cut across these disorders capture feelings of vulnerability and negative affect (e.g., anxiety, stress, and dysphoria). This factor is conceptually similar to the *internalizing* dimensions found in previous studies, although the omission of generalized anxiety disorder and dysthymic disorder from this factor is surprising. We believe that the low factor loadings of these two disorders were due to our diagnostic approach. Rather than assigning multiple neighboring diagnoses (e.g., dysthymia, generalized anxiety, and major depression), our diagnosticians sought to assign the one that "best" described the patient. In many cases, this resulted in major depressive disorder being diagnosed and dysthymia or generalized anxiety disorder being omitted (e.g., see DSM criterion F for generalized anxiety disorder). This conservative diagnostic approach departs from the more liberal approach often used in epidemiological samples, and results in reduced rates of diagnostic overlap, and, by extension, lower factor loadings for some diagnoses.

The third factor had loadings from antisocial personality disorder, drug dependence, alcohol dependence, and borderline personality disorder. The symptom areas that overlap between these disorders seem to capture impulsiveness, irresponsibility, and substance abuse. This factor is conceptually similar to the externalizing dimensions found in previous studies, although we elect to label it *disinhibition* as some have argued that externalizing is a higher-order dimension encompassing both disinhibition and antagonism (Kotov et al., 2017).

The fourth factor included histrionic personality disorder, narcissistic personality disorder, and paranoid personality disorder. The core symptom areas that define each of these disorders include attention-seeking, grandiosity, and mistrustfulness. These behaviors share a tendency to place afflicted individuals at odds with others, and this factor is consistent with the antagonism dimensions found in previous studies. However, from an interpersonal perspective, the core features that cut across these diagnoses is *dominance* and not antagonism per se, which is a blend of interpersonal dominance and coldness.

Finally, the fifth factor had a single loading from obsessive-compulsive personality disorder. Some previous studies examining the joint structure of syndromal and personality disorders have found that obsessive-compulsive personality disorder loads on internalizing (Wright and Simms, 2015) or antagonism (Røysamb et al., 2011), whereas several studies examining the structure of personality disorders alone have found that it required its own factor (O'Connor, 2005; Wright et al., 2016). Following the example of these latter studies, we retained this single-indicator factor and labeled it *compulsivity*.

The pattern of correlations between factors reveals that internalizing was highly associated with both detachment and dominance. Detachment was also moderately associated with compulsivity, and disinhibition was moderately associated with dominance. Compulsivity

was modestly, but negatively, associated with disinhibition. Some of these associations are as expected, such as the strong association between internalizing and detachment, the disorders of which form a higher-order spectrum, and the negative association between disinhibition and compulsivity. Certain others, such as the association between dominance and internalizing, were unexpected.

Psychopathology and Interpersonal Problems

Transdiagnostic Dimensions—In line with our second hypothesis, our results regarding the association between interpersonal problems and transdiagnostic dimensions were consistent with those found by the previous two studies (Wright et al., 2012; Williams and Simms, 2016). This consistency shows that these findings have generalizability across clinical and nonclinical samples, as well as across self-reported and clinician-administered measures of symptomatology. The current study did not include a thought disorder factor and the previous studies did not include a compulsivity factor. Thus, direct comparisons are limited to the detachment, disinhibition, dominance, and internalizing factors.

The current study agreed with the previous two that most transdiagnostic dimensions had good interpersonal prototypicality and marked elevation. The specific interpersonal styles associated with each dimension were also quite consistent across studies: the disinhibition and dominance factors had a domineering style and the detachment factor had a socially avoidant style. However, interpersonal styles in the current study tended to be “warmer” (i.e., higher in communion) than those in previous studies. There was also a difference in the prototypicality of the internalizing factor across studies (and thus in whether its interpersonal style could be interpreted). Whereas the two studies using clinical samples found that internalizing had poor prototypicality, the study using a student sample found that internalizing had adequate prototypicality. This pattern of results suggests that the interpersonal heterogeneity associated with internalizing is most pronounced in clinical settings (e.g., in the context of higher symptom severity).

Finally, the current study included a compulsivity factor that has no direct analogue in the study by Wright et al. The interpersonal profile associated with this factor suggests that the latent dimension underlying obsessive-compulsive personality disorder is associated with a socially avoidant interpersonal style as well as with generalized interpersonal distress. This profile is similar to that of the detachment profile (i.e., the point estimate fell within the confidence intervals of the other spectrum) and the two factors were also moderately positively correlated in the CFA model.

Personality Disorders—In line with our second hypothesis, our results regarding the association between interpersonal problems and personality disorders were consistent with the results of Wilson et al. (2017). The current study replicated the meta-analytical finding that most personality disorders have good interpersonal prototypicality. However, the current study also found that dependent and obsessive-compulsive personality disorders had good prototypicality, which Wilson et al. (2017) did not find. It is worth noting that the current study did find that these two personality disorders had relatively lower prototypicality than

the other personality disorders, so this difference between studies may be one of degree rather than one of kind.

The current study also replicated the findings of Wilson et al. (2017) regarding the interpersonal style of all included personality disorders except borderline personality disorder. The current study found that this disorder had a domineering style, whereas Wilson et al. (2017) found that it had a vindictive style. There has been considerable inconsistency in the literature regarding the interpersonal style associated with borderline personality disorder (Wright et al., 2013b,a). Thus, this apparently small difference between findings may actually underestimate a larger issue of interpersonal instability and heterogeneity in borderline personality disorder.

The largest differences between the two studies were regarding the distinctiveness and elevation of the personality disorders loading on the dominance factor (i.e., histrionic, narcissistic, and paranoid personality disorders). Although the two studies agreed regarding the interpersonal style of these disorders, Wilson et al. (2017) found that their profiles had marked distinctiveness and elevation whereas the current study did not.

Syndromal Disorders—The current study is the most comprehensive examination to date of interpersonal dysfunction in syndromal disorders. Of the eight included syndromal disorders, four had good interpersonal prototypicality. Alcohol dependence and drug dependence both had a domineering interpersonal style and neither was markedly distinctive or elevated. Panic disorder and social phobia both had a nonassertive style and marked elevation; this interpersonal style is consistent with previous findings for both disorders (Cain et al., 2010; Kachin et al., 2001; Stangier et al., 2006; Zilcha-Mano et al., 2015).

Three of the remaining four syndromal disorders had adequate, but not good, interpersonal prototypicality. Especially when combined with low profile distinctiveness, this finding suggests that dysthymic disorder, generalized anxiety disorder, and major depression are interpersonally heterogeneous. On the whole, dysthymic disorder had a socially avoidant interpersonal style and both generalized anxiety disorder and major depression had a nonassertive interpersonal style. Additionally, major depressive disorder had marked elevation. Previous studies have found that generalized anxiety disorder, on average, has an exploitable interpersonal style (Przeworski et al., 2011; Salzer et al., 2011, 2008); our results may differ due to our diagnostic approach. Our results for major depression are consistent with sample averages from previous studies (Barrett and Barber, 2007; Dinger et al., 2015; Grosse Holtforth et al., 2014; Locke et al., 2016; Quilty et al., 2013; Stangier et al., 2006).

Finally, posttraumatic stress disorder had very low prototypicality and only modest elevation. This rather unusual pattern may be due to the fact that posttraumatic stress disorder is the only disorder among those considered here that has an external event as a diagnostic criterion. There is considerable variety among the types of events that might trigger posttraumatic stress (e.g., military combat, car accident, or sexual assault), and possibly among the types of people and interpersonal styles that are at the greatest risk of experiencing them. In other words, this low prototypicality may be due to high interpersonal

heterogeneity, which would be consistent with research on interpersonal traits associated with the disorder (Thomas et al., 2014a).

Interpersonal Heterogeneity—In line with our third hypothesis, several of the transdiagnostic dimensions were quite homogeneous. That is, they showed good prototypicality, marked distinctiveness, and similar parameters to the individual diagnoses that load on them. Figure 5, for instance, shows that diagnoses loading on the detachment factor were very similar in terms of interpersonal style and primarily differed in terms of distinctiveness (i.e., avoidant personality disorder had more distinctiveness than the others). Similarly, Figure 7 shows that diagnoses loading on the disinhibition factor were highly similar in terms of interpersonal style and distinctiveness (although antisocial personality disorder had more distinctiveness than the others). Interestingly, the diagnoses with primary loadings on these homogeneous factors all had good prototypicality.

In contrast, several dimensions were more heterogeneous. Figure 8 shows that diagnoses loading on the dominance factor were all high on agency, but differed considerably in terms of communion. Paranoid personality disorder was lower on communion with a vindictive interpersonal style, narcissistic personality disorder was relatively neutral on communion with a domineering style, and histrionic personality disorder was higher on communion with an intrusive style. The dominance factor and all diagnoses loading on it had good prototypicality but modest distinctiveness, which may suggest a moderate degree of interpersonal heterogeneity. In contrast, Figure 6 shows that diagnoses loading on the internalizing factor differed considerably. Whereas major depression and panic disorder had a nonassertive style, dependent personality disorder had an exploitable style and borderline personality disorder had a domineering style. Although it also loaded on this factor, posttraumatic stress disorder is not shown due to it having inadequate prototypicality.

Taken together, these results suggest that transdiagnostic dimensions do not always consolidate the heterogeneity among various related disorders into a clearer interpersonal signal. When the individual diagnoses that load on a transdiagnostic dimension are homogeneous themselves, that dimension can parsimoniously represent their common interpersonal profile. However, when the individual diagnoses are heterogeneous, that dimension may fail to achieve interpersonal prototypicality. These findings are consistent with previous research on pathoplasticity in depressive and anxiety disorders (e.g., Cain et al., 2012, 2010).

Research Implications

Our findings regarding the connections between psychopathology and interpersonal problems have significant implications for clinical research. First, they suggest that interpersonal heterogeneity is most common in the internalizing spectrum of disorders. This heterogeneity may be related to differences between disorders (e.g., depression versus borderline personality disorder), differences within disorders (e.g., pathoplasticity), or both. Regardless, it appears that the internalizing dimension has a less consistent interpersonal signal than the other dimensions and may be best characterized by its association with generalized interpersonal distress.

Second, whereas borderline personality disorder loaded more heavily on the internalizing factor than on the disinhibition factor, its characteristic interpersonal problems in our sample were more domineering and thus more like the interpersonal problems associated with disinhibition. These results suggest that borderline personality disorder represents a complex combination of internalizing and externalizing phenomena (e.g., disinhibition), and that it would be a mistake to ignore either component (Linehan et al., 1999). Also, given the evidence that individuals with severe borderline personality pathology vary in their self-reported problems over time (likely as a consequence of their unstable and diffuse identities; Wright et al., 2013a), re-examining interpersonal problems in a longitudinal sample will be important in the future.

Third, our results provide further evidence that the interpersonal dimension of agency has important connections to psychopathology. Numerous evolutionary theories highlight the importance of agency-related concepts (e.g., inferiority, submission, and defeat) in depression (Price et al., 1994; Gilbert, 1992; Zuroff et al., 2007). Our results suggest that this dimension extends beyond depression and has relevance for most common disorders (Blatt, 2008; Horowitz, 2004). Agency was significantly reduced for the detachment and compulsivity factors, as well as for dysthymia, major depression, panic disorder, social phobia, and avoidant personality disorder. In contrast, agency was significantly increased for the disinhibition and dominance factors, as well as for alcohol dependence, drug dependence, and antisocial, borderline, histrionic, narcissistic, and paranoid personality disorders. Communion was also related to several factors and disorders, albeit to a less consistent degree. Specifically, communion was significantly reduced for the detachment and compulsivity factors, as well as for avoidant and paranoid personality disorders. Communion was significantly increased for dependent and histrionic personality disorders.

Lastly, our study demonstrates the importance of moving “up and down” the psychopathology hierarchy. The higher level of the hierarchy (which contains the transdiagnostic dimensions) provides a parsimonious account of the broader patterns shared by related disorders, whereas the lower level of the hierarchy (which contains the individual disorders) shows how diagnoses converge and diverge. This lower level is critical for establishing the extent to which a given pattern is specific to one disorder rather than shared among similar ones. Antisocial personality disorder is a prime example of how both levels inform our understanding: as a disinhibition disorder, it is marked by a domineering interpersonal style; however, it is uniquely high among disinhibition disorders in terms of the distinctiveness of this style.

Clinical Implications

Our findings also have important implications for clinical practice. First, due to the heterogeneity evident within many disorders (especially those on the internalizing spectrum), our results suggest that explicit interpersonal assessment is warranted. For example, while it may be relatively safe to assume that a patient with alcohol dependence will show a domineering interpersonal style, it is not clear what style will be associated with posttraumatic stress disorder or even major depression. Fortunately, an IIP-C can be

administered at low cost and can provide valuable clinical information about individual patients.

Second, while we used sophisticated trigonometric calculations to take advantage of the circular structure of the IPC and discussed several structural summary parameters at length, the model can be decomposed more simply into agency and communion. Indeed, the parsimony of this representation is a large part of its appeal.

Finally, our results support the idea that interpersonal therapy techniques (e.g., communication analysis and role-playing) may benefit many different disorders (Weissman et al., 2000). While these techniques have traditionally been aimed at treating internalizing disorders (e.g., assertiveness training for depression and social phobia), disinhibition disorders may also benefit from interpersonal techniques aimed at lowering problematic levels of agency. We suspect that one of the reasons that motivational interviewing (Miller and Rollnick, 2012) is effective with substance abuse is because it honors patients' autonomy; for the same reason, this technique is likely to be an important component of treatment for antisocial and other personality disorders (Ginsburg et al., 2005).

Limitations and Future Directions

As described in section , there were several differences between the subsamples in the current study. The first subsample used diagnostic criteria from DSM-III-R, whereas all other subsamples used criteria from DSM-IV; additionally, the fifth subsample used diagnoses provided by a single clinician, whereas all other subsamples used LEAD consensus diagnoses. We note, however, that in sensitivity analyses excluding these subsamples, the results were highly consistent (see the supplemental materials). Our sample was also predominantly white, and our ability to generalize to non-white participants may be limited. Finally, psychosis was an exclusion criterion in our samples and several personality disorders (e.g., schizoid and schizotypal) were too rare in the sample to include in our analyses; as such, we were not able to model a transdiagnostic dimension corresponding to thought disorder or psychoticism.

Future work could address these limitations and expand our findings by examining how interpersonal problems relate to other disorders and transdiagnostic dimensions, as well as by moving beyond dispositional measures of interpersonal difficulties to observational and ambulatory measures that can capture interpersonal processes in daily life. Such work has yielded results that highlight the importance of contextual factors and the interpersonal behavior of one's interactants (Pincus et al., 2014; Thomas et al., 2014b; Wright et al., 2017; Zuroff et al., 2007).

Conclusions

In sum, our hierarchical approach revealed new information about the nuanced connections between psychopathology and interpersonal problems. We replicated a five-factor structure of psychiatric diagnoses including factors corresponding to detachment (avoidant personality, social phobia, major depression), internalizing (dependent personality, borderline personality, panic disorder, posttraumatic stress, major depression), disinhibition (antisocial personality, drug dependence, alcohol dependence, borderline personality),

dominance (histrionic personality, narcissistic personality, paranoid personality), and compulsivity (obsessive-compulsive personality). All of the dimensions showed good interpersonal prototypicality except for the internalizing factor, which was heterogeneous. The detachment factor had a socially avoidant and nonassertive interpersonal style, the compulsivity factor had a nonassertive style, and both the disinhibition and dominance factors had a domineering style. Finally, whereas all dimensions were markedly associated with generalized interpersonal distress, the detachment and internalizing factors were relatively more elevated than the others. These results suggest that interpersonal heterogeneity is most pronounced in the internalizing spectrum of disorders, which may be best characterized by generalized distress.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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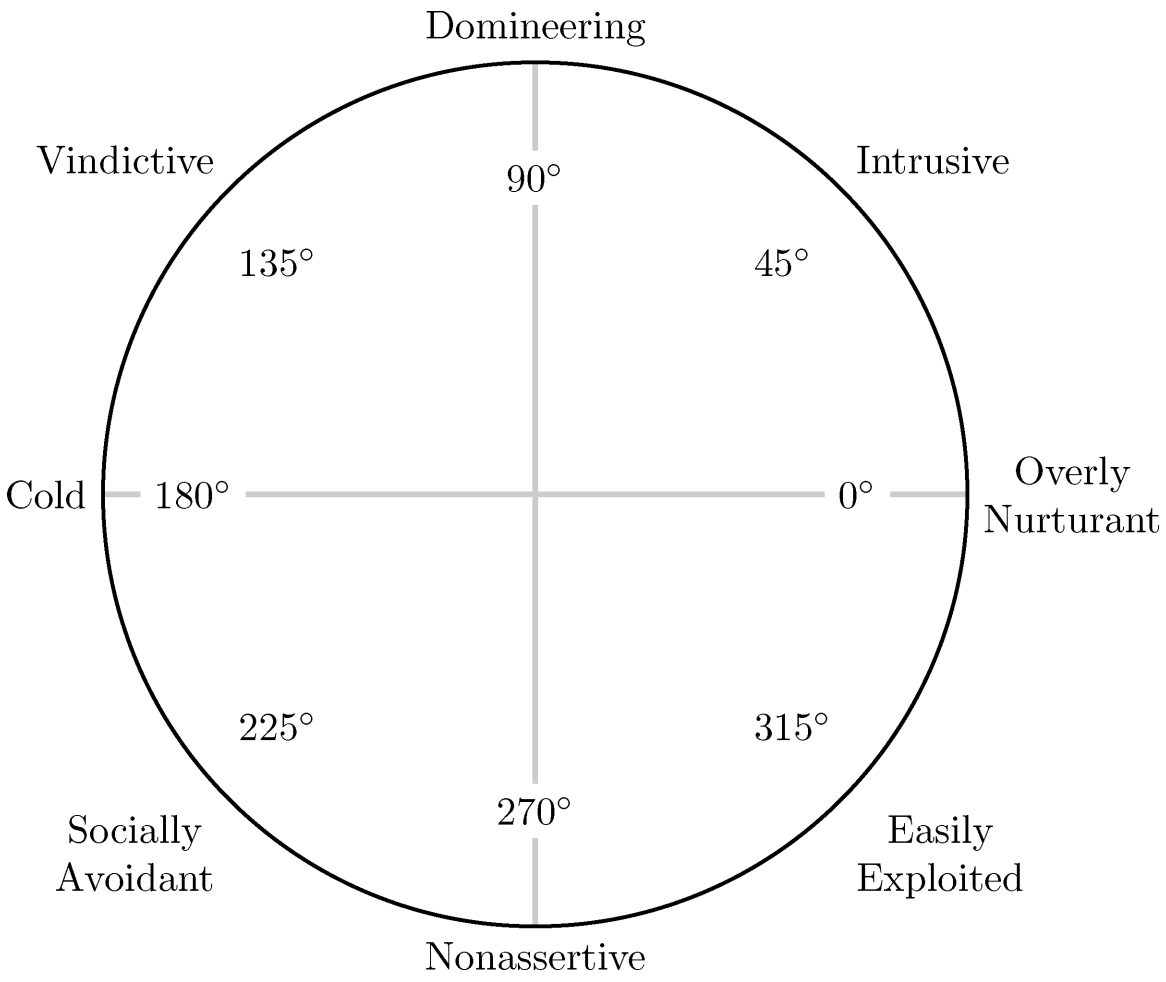

Figure 1. Representation of the IIP-C model with descriptive labels and angular displacements for each octant subscale

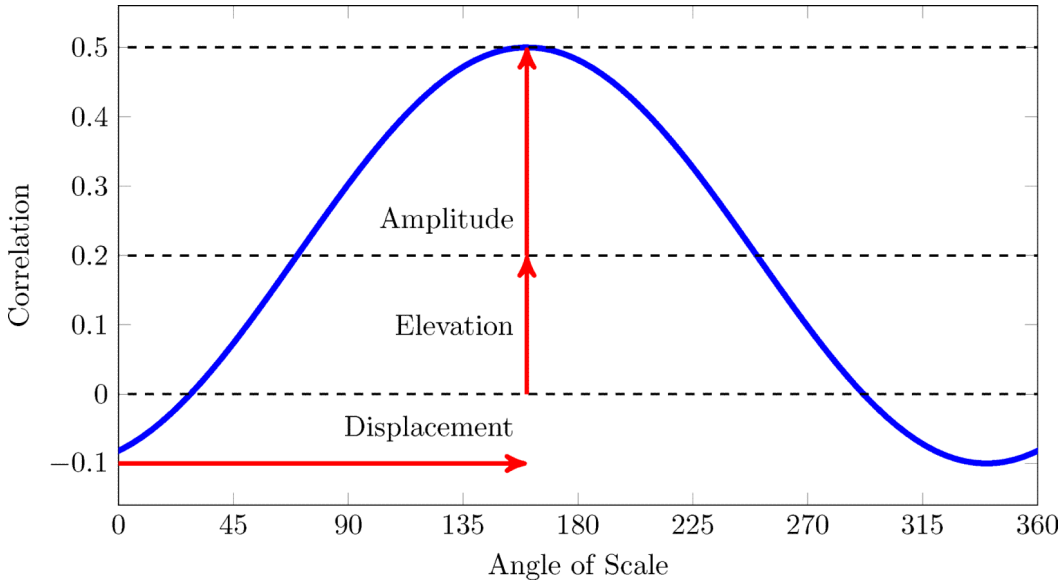

Figure 2.
Example of the structural summary parameters (in red) and the expected pattern of associations (in blue).

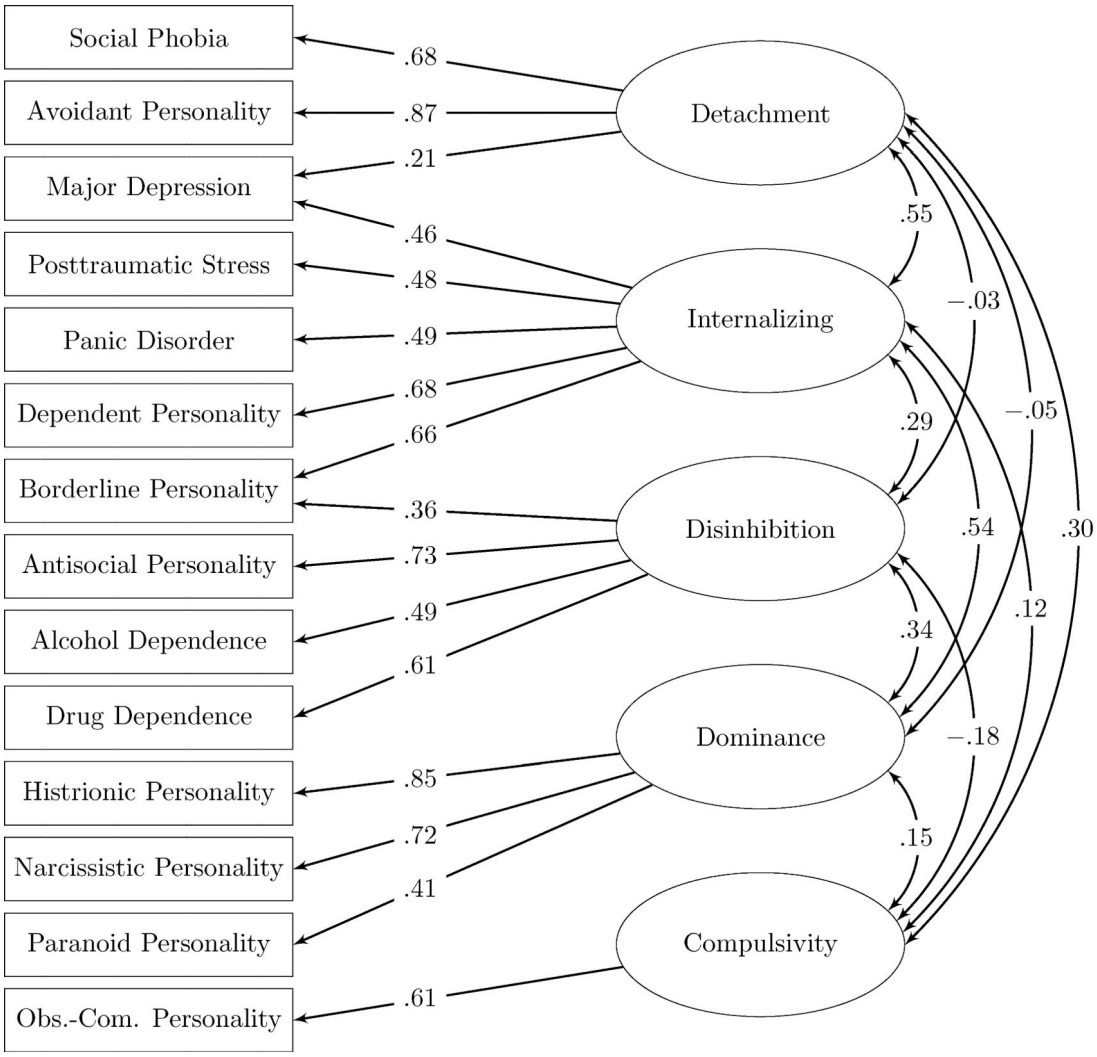

Figure 3. CFA model of diagnoses and psychopathology dimensions with standardized factor loadings and correlations

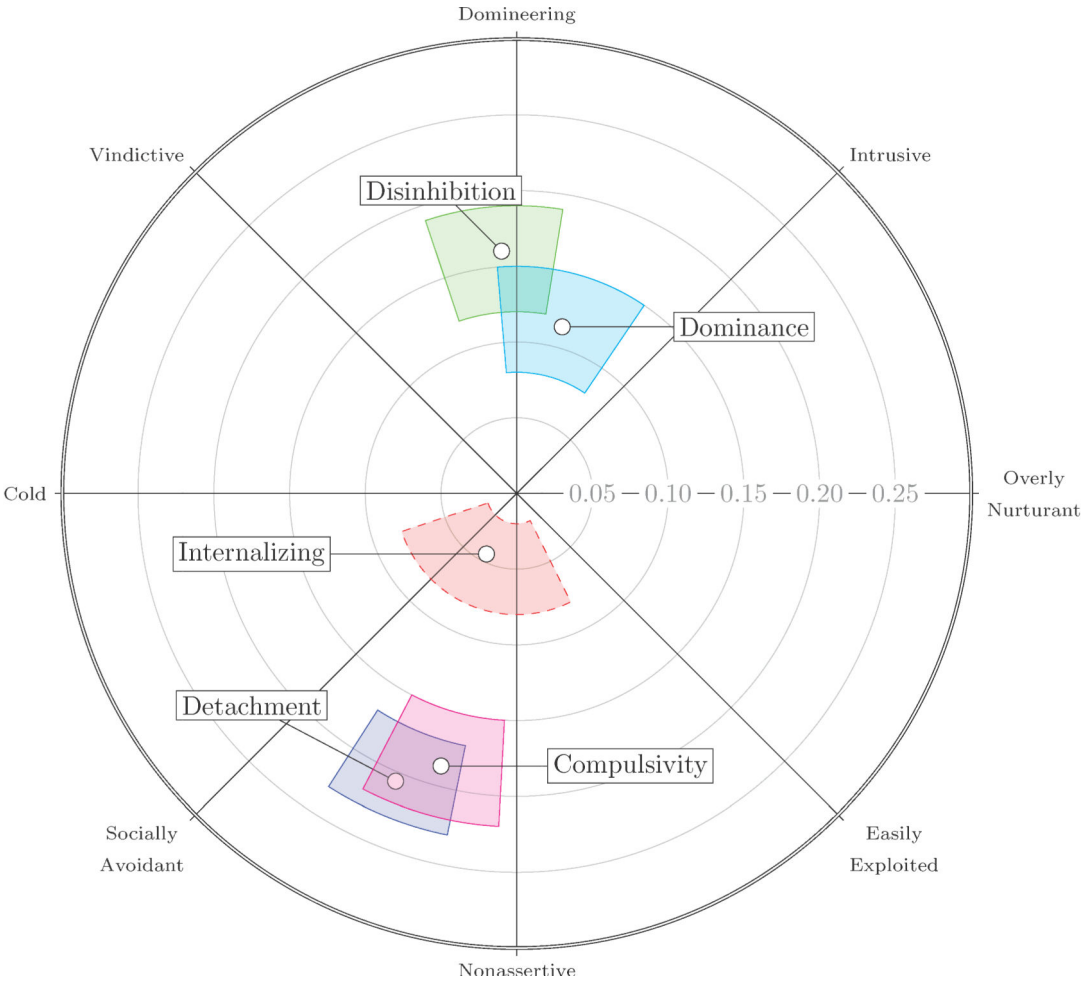

Figure 4.

Radar chart of psychopathology factor scores' projections into the IIP's interpersonal circumplex model. Dots represent mean values and colored regions represent 95% confidence intervals

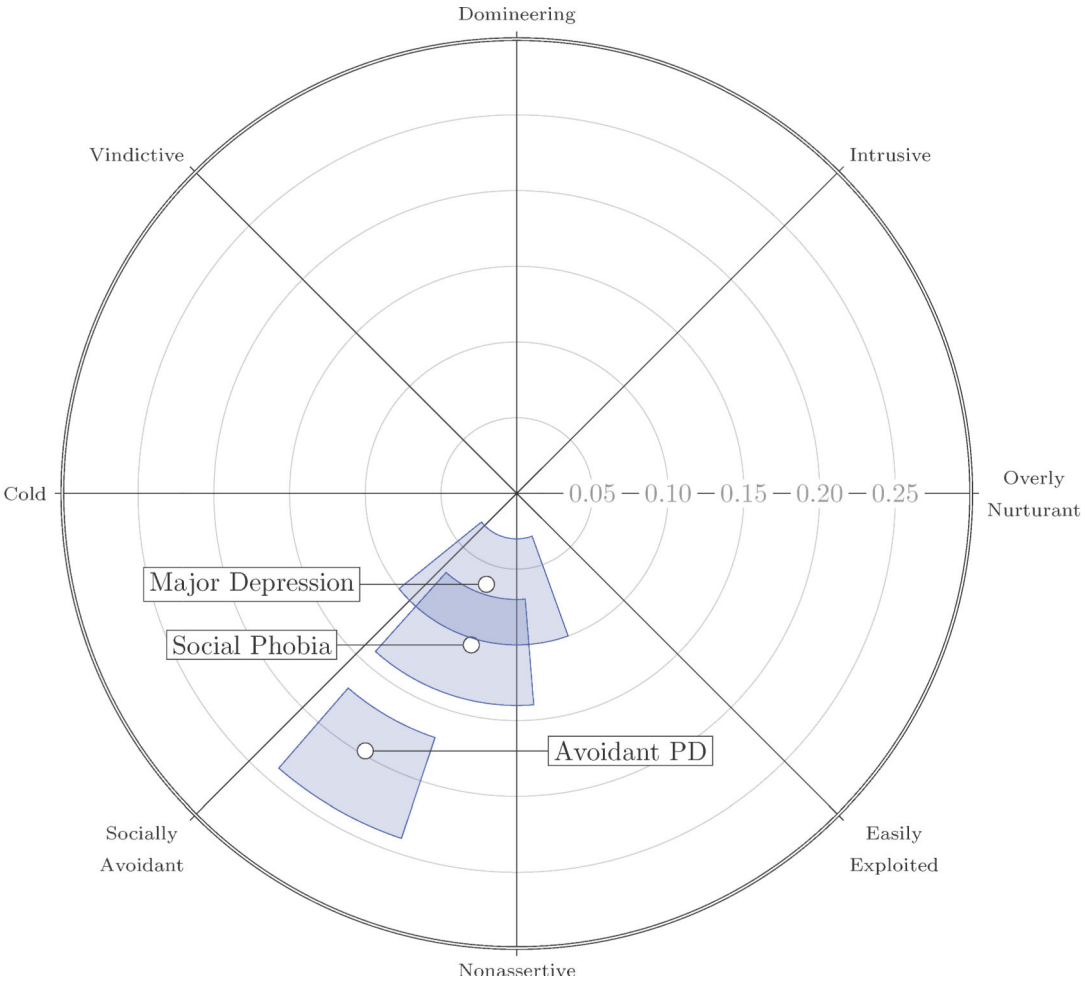

Figure 5.

Radar chart of detachment diagnoses' projections into the IIP's interpersonal circumplex model. Dots represent mean values and colored regions represent 95 % confidence intervals

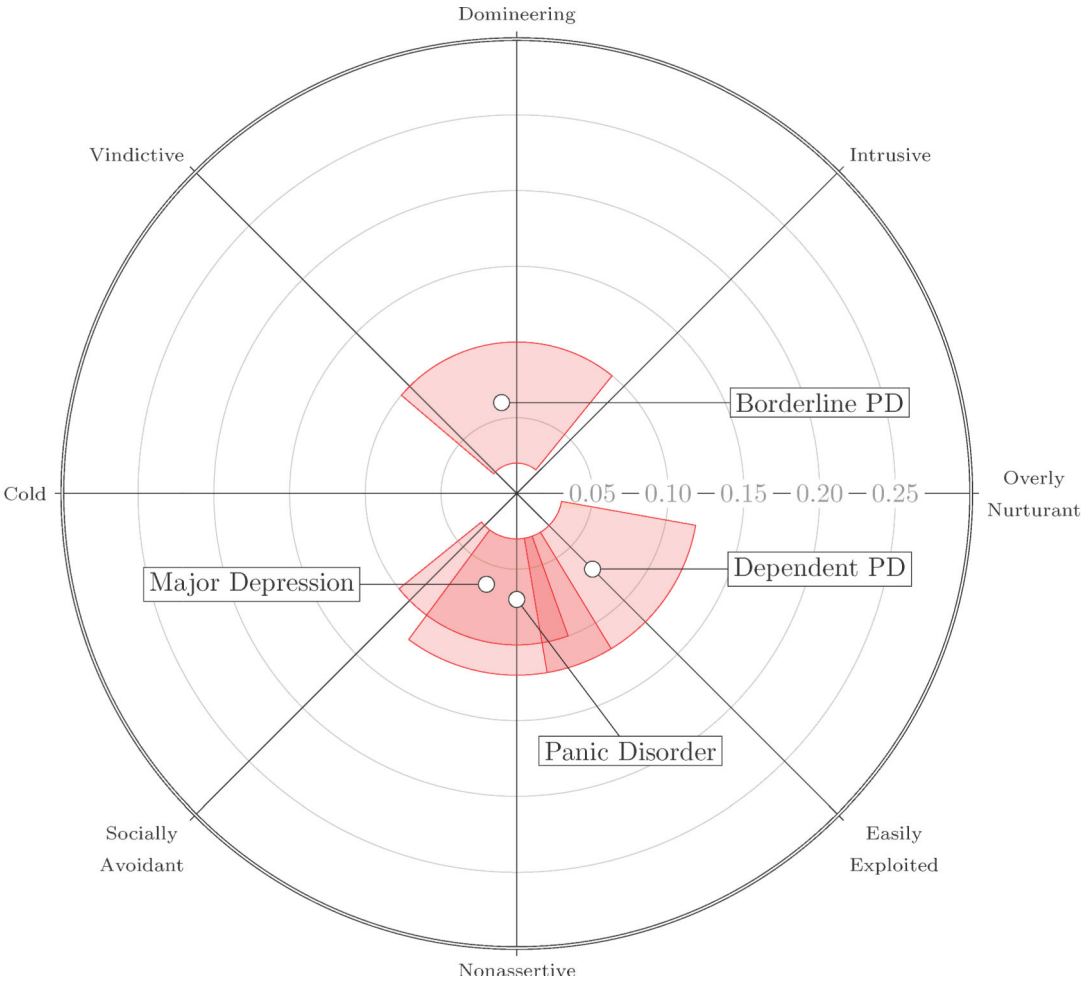

Figure 6.

Radar chart of internalizing diagnoses' projections into the IIP's interpersonal circumplex model. Dots represent mean values and colored regions represent 95 % confidence intervals

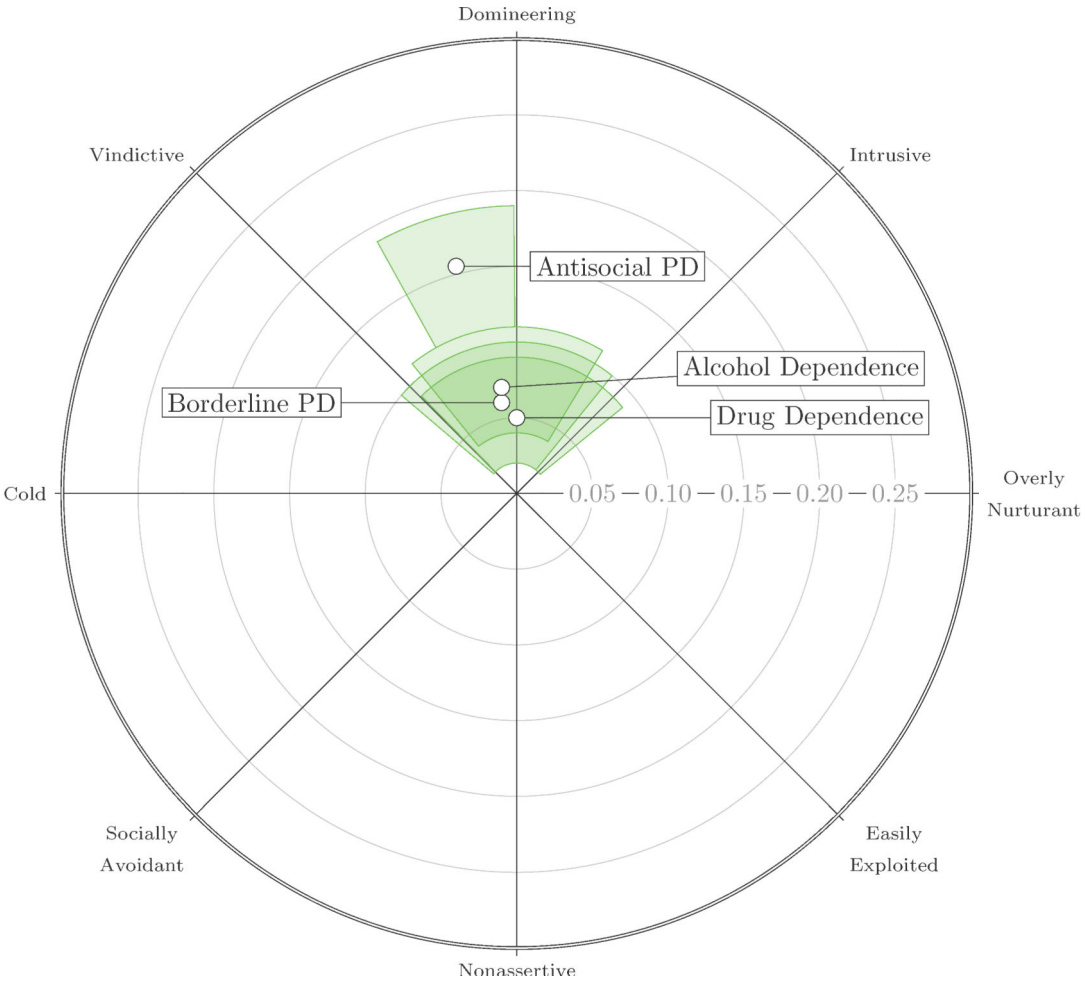

Figure 7.

Radar chart of disinhibition diagnoses' projections into the IIP's interpersonal circumplex model. Dots represent mean values and colored regions represent 95 % confidence intervals

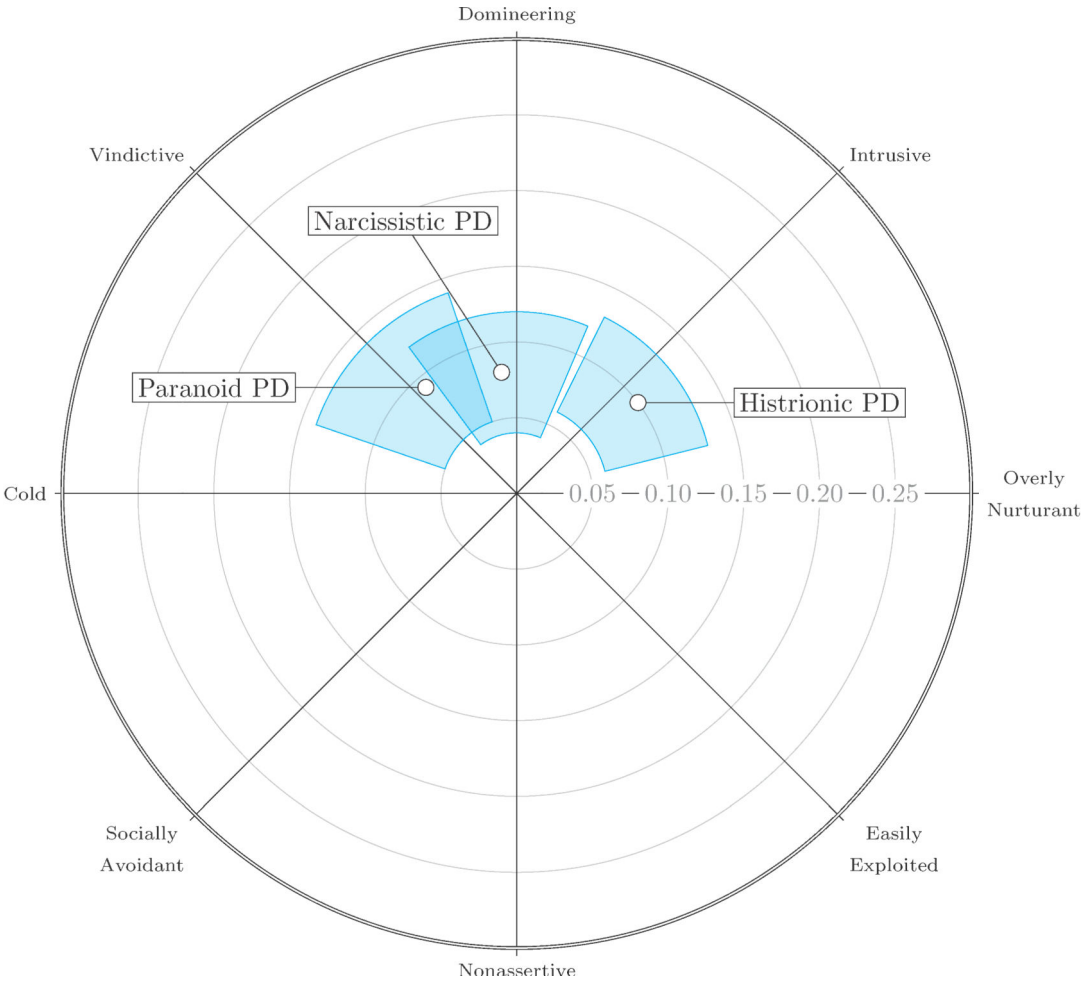

Figure 8.

Radar chart of dominance diagnoses' projections into the IIP's interpersonal circumplex model. Dots represent mean values and colored regions represent 95 % confidence intervals

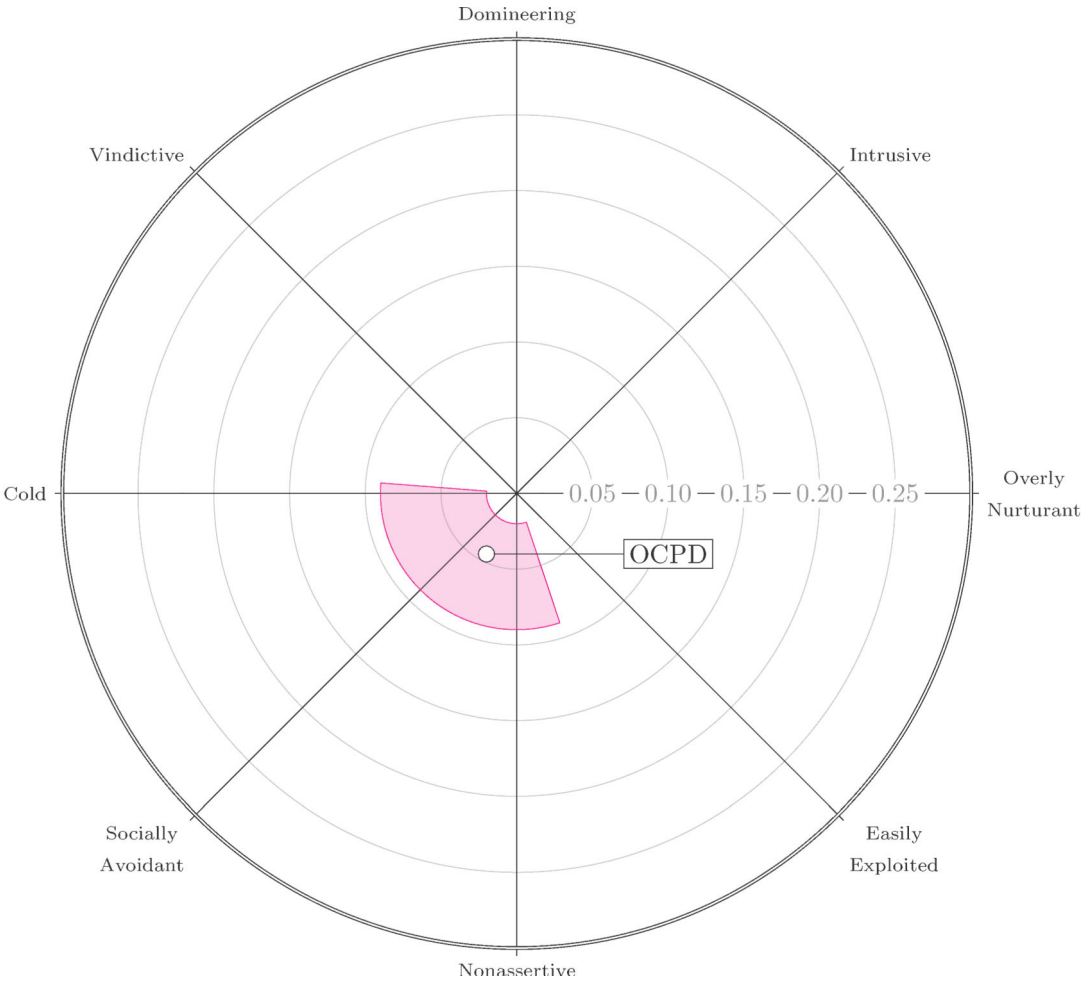

Figure 9.

Radar chart of compulsivity diagnoses' projections into the IIP's interpersonal circumplex model. Dots represent mean values and colored regions represent 95 % confidence intervals

Table 1

Demographic and Methodological Information about Subsamples

Subsample	n	Age Mean (SD)	Female (%)	White (%)	DSM	Diagnosis Type
1. Validity	145	34.7 (9.3)	57.2	89.0	III-R	LEAD Consensus
2. Screening	146	38.9 (11.3)	68.5	87.0	IV	LEAD Consensus
3. Interpersonal Functioning	138	37.9 (10.5)	76.1	73.9	IV	LEAD Consensus
4. Emotion and Interpersonal Functioning	141	45.0 (10.4)	64.5	87.0	IV	LEAD Consensus
5. Couples	255	29.8 (7.1)	56.1	75.3	IV	Structured Interview
Overall	825	36.2 (10.9)	63.3	76.5		

Table 2
Prevalence Rates and Gender Ratios for Each Diagnosis

Diagnosis	Prevalence (%)	Female (%)
Alcohol Dependence	12.0	46.5
Drug Dependence	8.5	58.6
Dysthymia	8.8	63.0
Generalized Anxiety	10.5	71.3
Major Depression	41.1	73.5
Panic Disorder	10.7	81.8
Posttraumatic Stress	7.0	84.5
Social Phobia	9.3	71.4
Antisocial Personality	9.2	50.0
Avoidant Personality	18.5	58.8
Borderline Personality	23.4	75.6
Dependent Personality	7.6	73.0
Histrionic Personality	8.4	73.9
Narcissistic Personality	12.1	41.0
Obs.-Com. Personality	13.5	61.3
Paranoid Personality	6.3	65.4

Table 3

Product-Moment Correlations between Psychopathology Factor Scores and IIP-C Octant Scores

	IIP-C Scales							
	PA	**BC**	**DE**	**FG**	**HI**	**JK**	**LM**	**NO**
Detachment	.13	.27	.42	**.59**	.49	.40	.33	.17
Internalizing	.34	.40	.43	**.49**	.43	.40	.45	.37
Disinhibition	**.39**	.32	.22	.11	.06	.09	.20	.29
Dominance	**.33**	.30	.21	.14	.13	.17	.28	.34
Compulsivity	.02	.16	.28	**.44**	.38	.30	.24	.10

Note. $N = 825$. IIP-C = Inventory of Interpersonal Problems–Circumplex Scales; PA = Domineering; BC = Vindictive; DE = Cold; FG = Socially Avoidant; HI = Nonassertive; JK = Exploitable; LM = Overly Nurturant; NO = Intrusive.

Table 4

Biserial Correlations between Diagnoses and IIP-C Octant Scores

	IIP-C Scales							
	PA	**BC**	**DE**	**FG**	**HI**	**JK**	**LM**	**NO**
Alcohol Dependence	**.22**	.20	.15	.04	.02	.02	.13	.19
Drug Dependence	**.18**	.15	.08	.03	−01	.07	.06	.15
Dysthmyia	.01	.05	**.28**	.24	.21	.15	.10	.10
Generalized Anxiety	.09	.11	.08	.21	**.24**	.18	.17	.10
Major Depression	.21	.33	.37	.43	**.39**	.36	**.39**	.27
Panic Disorder	.10	.18	.29	**.39**	.33	.34	.32	.18
Posttraumatic Stress	.12	.14	.16	.15	.04	.07	**.20**	.11
Social Phobia	.09	.17	.33	**.54**	.44	.33	.26	.19
Antisocial Personality	**.48**	.36	.20	.05	−10	−05	.08	.25
Avoidant Personality	.05	.29	.50	**.71**	.53	.41	.27	.08
Borderline Personality	**.51**	.47	.42	.38	.35	.33	.43	.45
Dependent Personality	.19	.21	.20	.38	**.45**	.42	.43	.40
Histrionic Personality	.24	.15	.02	.02	.10	.15	.29	**.41**
Narcissistic Personality	**.28**	**.28**	.20	.11	.02	.07	.19	.23
Obs.-Com. Personality	.07	.05	.16	**.17**	.16	.10	.08	.02
Paranoid Personality	.25	**.37**	.22	.14	.00	−01	.00	.13

Note. N = 825. IIP-C = Inventory of Interpersonal Problems–Circumplex Scales; PA = Domineering; BC = Vindictive; DE = Cold; FG = Socially Avoidant; HI = Nonassertive; JK = Exploitable; LM = Overly Nurturant; NO = Intrusive.

Table 5

Structural Summary Parameters for Psychopathology Factor Scores with Bootstrapped 95 % Confidence Intervals

	Elevation (*e*)	Communion	Agency	Amplitude (*a*)	Displacement (*δ*)	R^2	Prob.
Detachment	.35 [.31,.39]	−.08 [−11,−04]	−.19 [−22,−15]	.20 [.17,.23]	248.0 [237.3,258.5]	.94	1.00
Internalizing	.41 [.37,.45]	−.02 [−05,.02]	−.04 [−08,−01]	.05 [.02, .08]	249.9 [198.3,296.4]	.57	.74
Disinhibition	.21 [.16,.26]	−.01 [−05,.02]	.16 [.12,.19]	.16 [.12,.19]	95.1 [80.8,108.5]	.99	1.00
Dominance	.24 [.19,.28]	.03 [−01,.07]	.11 [.07,.15]	.11 [.08,.15]	74.7 [55.9,94.9]	.98	1.00
Compulsivity	.24 [.19,.29]	−.05 [−09,−01]	−.18 [−21,−14]	.18 [.15,.22]	255.5 [242.5,266.9]	.94	1.00

Note. N = 825. R^2 = Prototypicality; Prob. = Probability of accurate bootstrap confidence intervals.

Table 6

Structural Summary Parameters for Individual Diagnoses with Bootstrapped 95 % Confidence Intervals

	Elevation (*e*)	Communion	Agency	Amplitude (a)	Displacement (*δ*)	R^2	Prob.
Alcohol Dependence	.07 [+.02, +.12]	−.01 [−.05, +.04]	.07 [+.03, +.10]	.07 [+.04, +.11]	95.2 [59.0,128.9]	.97	.98
Drug Dependence	.05 [.00, +.10]	.00 [−.03, +.04]	.05 [+.01, +.08]	.05 [+.02, +.09]	88.8 [39.1,134.4]	.91	.80
Dysthymia	.08 [+.04, +.13]	−.03 [−.07, +.01]	−.05 [−.09, −.01]	.06 [+.02, +.10]	240.8 [196.3,280.6]	.72	.82
Generalized Anxiety	.09 [+.04, +.14]	.01 [−.03, +.04]	−.04 [−.08, .00]	.04 [+.01, +.09]	283.3 [206.0,339.7]	.79	.66
Major Depression	.27 [+.23, +.32]	−.02 [−.05, +.02]	−.06 [−.10, −.02]	.06 [+.03, +.10]	256.6 [219.0,289.8]	.71	.94
Panic Disorder	.16 [+.11, +.21]	.00 [−.04, +.04]	−.07 [−.12, −.03]	.07 [+.03, +.12]	269.0 [233.5,301.3]	.85	.96
Posttraumatic Stress	.07 [+.01, +.12]	−.01 [−.04, +.03]	.01 [−.03, +.06]	.01 [+.01, +.06]	110.1 [311.8,275.7]	.15	.22
Social Phobia	.17 [+.12, +.22]	−.03 [−.07, +.01]	−.10 [−.15, −.06]	.11 [+.07, +.14]	254.5 [228.2,274.6]	.89	1.00
Antisocial Personality	.09 [+.03, +.15]	−.04 [−.08, .00]	.15 [+.11, +.18]	.15 [+.11, +.19]	104.6 [90.6,119.0]	.97	1.00
Avoidant Personality	.24 [+.20, +.29]	.24 [+.20, +.29]	−.17 [−.21, −.14]	.20 [+.17, +.24]	239.9 [229.1,251.5]	.95	1.00
Borderline Personality	.30 [+.26, +.35]	−.01 [−.05, +.03]	.06 [+.02, +.09]	.06 [+.02, +.10]	97.5 [51.0,139.6]	.92	.87
Dependent Personality	.18 [+.14, +.23]	.05 [+.01, +.10]	−.05 [−.09, +.01]	.08 [+.03, +.12]	316.2 [279.6,349.9]	.85	.84
Histrionic Personality	.10 [+.05, +.14]	.08 [+.04, +.12]	.06 [+.02, +.10]	.10 [+.06, +.13]	37.4 [14.1, 63.6]	.92	.99
Narcissistic Personality	.11 [+.06, +.16]	−.01 [−.05, +.03]	.08 [+.03, +.11]	.08 [+.04, +.12]	98.8 [67.0,126.4]	.95	.98
Obs.-Comp. Personality	.07 [+.01, +.12]	−.02 [−.06, +.01]	−.04 [−.08, .00]	.05 [+.02, +.09]	238.4 [175.6,288.4]	.85	.62
Paranoid Personality	.07 [+.01, +.12]	−.06 [−.10, −.02]	.07 [+.02, +.11]	.09 [+.05, +.14]	133.8 [108.9,161.1]	.95	.93

Note. N = 825. R^2 = Prototypicality; Prob. = Probability of accurate bootstrap confidence intervals.