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Objective: The identification of reliable predictors of course in major depressive disorder (MDD) has been difficult. Evidence suggests that the co-occurrence of personality pathology is associated with longer time to MDD remission. Interpersonal pathoplasticity, the mutually influencing nonetiological relationship between psychopathology and interpersonal traits, offers an avenue for examining specific personality vulnerabilities that may be associated with depressive course. ***Method:*** This study examined 312 participants with and without a co-occurring personality disorder diagnosis who met criteria for a current MDD episode at baseline and who were followed for 10 years in the Collaborative Longitudinal Personality Disorders Study. ***Results:*** Latent profile analysis (LPA) identified 6 interpersonal groups (extraverted, dominant, arrogant, cold, submissive, and unassuming), and circular statistical profile analysis confirmed group interpersonal distinctiveness. No significant differences between groups were found in comorbid Axis I disorders or baseline MDD severity. Chronicity and functioning analyses found significantly greater chronicity and poorer functioning in individuals with a submissive interpersonal style over 10 years. ***Conclusions:*** These findings support the relevance of interpersonal pathoplasticity in depressive course and that this heterogeneity has clinical significance. This study is the first to use LPA and circular profiles to examine interpersonal heterogeneity within a diagnostic group. The implications of these findings for therapeutic intervention, interpersonal functioning, and psychopathological course are discussed.

Keywords: major depressive disorder, interpersonal circumplex, pathoplasticity

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The National Comorbidity Survey–Replication (Kessler et al., 2003) identified major depressive disorder (MDD) as the most common mental disorder in the United States with a lifetime prevalence rate of 16.6%. MDD often follows a chronic course, substantially impairing psychosocial functioning. One issue in the assessment and treatment of MDD is the need to identify reliable predictors of MDD course and outcome. Previous research has identified several potential predictors of longer time to remission and lower rates of remission, such as female gender (Kornstein et al., 2000), presence of dysthymia (Keller, Shapiro, Lavori, & Wolfe, 1982), and Axis I comorbidity (Keller et al., 1992). Grilo et al. (2005, 2010) investigated the influence of comorbid personality disorder (PD) diagnosis on the prospective course and outcome of MDD and found that patients with MDD with existing PD pathology had a significantly longer time to remission from MDD than patients with MDD without any PD, even when controlling for prognostic predictors. The presence of a PD at baseline or recurrent MDD but not gender or dysthymic disorder significantly predicted time to relapse. These studies demonstrate the importance of examining predictors over long-term follow-up and underscore the need to delineate specific baseline characteristics that influence course and outcome of MDD.

Interpersonal functioning may prove clinically useful in predicting the course of MDD. Pincus and Wright (2010) argued that evaluating interpersonal functioning is an essential part of the diagnostic process, beyond symptom assessment. Empirical and theoretical formulations have emphasized interpersonal functioning in the etiology and maintenance of major depression (see Joiner & Timmons, 2009, for a review). In particular, research has associated interpersonal dependency with increased vulnerability for major depression (see Zuroff, Mongrain, & Santor, 2004, for a review) and increased depressive symptoms over time (Mongrain, Lubbers, & Struthers, 2004). Although research suggests that dependent interpersonal styles may represent a risk factor for poorer course and functioning in depression, the current study aimed to assess whether a specific interpersonal style represents a negative prognostic risk factor over 10 years.

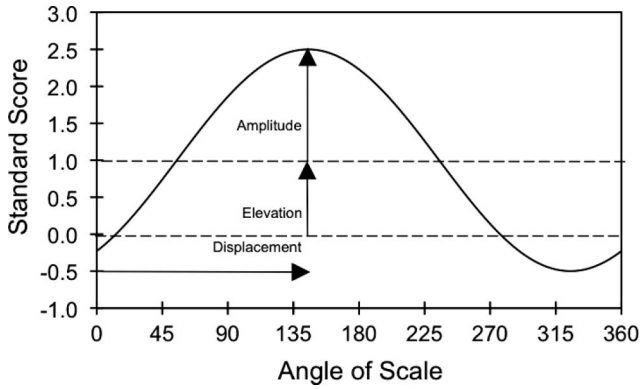

Figure 1. An example of a circumplex structural summary. *x*-axis = circumplex angle in degrees; *y*-axis = standard (*z*) score on the NEO Personality Inventory–Revised Form R interpersonal circumplex (IPC) octant. *Angular displacement* = the person's interpersonal "central tendency," signifying the individual's "typology" (Leary, 1957). *Amplitude* = measure of profile differentiation. It is viewed as a measure of the profile's "structured patterning" or degree of differentiation, indicating the extent then to which the predominant trend "stands out." An amplitude value of 0 indicates a flat (i.e., undifferentiated) profile; high amplitude indicates a profile with a clear interpersonal peak (and trough). *Elevation* = an index of stylistic response to IPC measures that do not contain a general substantive factor (Ansell & Pincus, 2004).

Table 1
Demographic and Clinical Characteristics

Variable	*n*	%
Sex		
Female	199	63.8
Male	113	36.2
Age, *M* (*SD*)	33.27 (6.92)	
Ethnicity		
Caucasian	230	73.7
African American	47	15.1
Hispanic	28	9.0
Asian	4	1.3
Other	3	0.9
Axis I comorbidity		
Substance abuse/dependence	137	43.9
Alcohol abuse/dependence	122	39.1
Posttraumatic stress disorder	106	34.0
Panic disorder	99	31.7
Social phobia	76	24.4
Generalized anxiety disorder	74	23.7
Dysthymic disorder	55	17.6
Obsessive compulsive disorder	50	16.0
MDD specifier		
Melancholic type	105	33.7
Atypical type	65	20.8
CLPS group assignment		
No PD/positive for MDD	77	24.7
Borderline PD	75	24.0
Avoidant PD	62	19.9
Obsessive compulsive PD	56	17.9
Schizotypal PD	42	13.5

Note. MDD = major depressive disorder; CLPS = Collaborative Longitudinal Personality Disorders Study; PD = personality disorder.

One method for examining interpersonal functioning as a predictor of MDD course and outcome is the interpersonal circumplex (IPC; Leary, 1957). The IPC is rooted in interpersonal theory, which posits one's interpersonal style can be described using two orthogonal dimensions: warmth and dominance. This model permits the description of individual or group data by locating them in the two-dimensional space created by the orthogonal dimensions. The IPC model of interpersonal style is applicable to understanding pathoplasticity in MDD course. Pathoplasticity is characterized by a mutually influencing nonetiological relationship between psychopathology and personality (Widiger & Smith, 2008). In this way, psychopathology and personality influence the expression of each other, but neither exclusively causes the other, as might occur in an etiological or spectrum relationship. Pathoplasticity recognizes that psychopathology occurs in the larger context of an individual's personality, making it unreasonable to assume that the expression of pathology would not be influenced by one's characteristic manner of perceiving, thinking, feeling, and relating to the environment (Widiger & Smith, 2008). Interpersonal pathoplasticity describes the observed heterogeneity in the phenotypic expression of psychopathology within the IPC model (e.g., Cain, Pincus, & Grosse Holtforth, 2010) and can predict variability in

response to psychotherapy within a disorder (e.g., Borkovec, Newman, Pincus, & Lytle, 2002).

To demonstrate interpersonal pathoplasticity in MDD, three criteria should be met: (a) the identification of distinct and homogeneous interpersonal groups of depressed individuals, (b) interpersonal group classification is not accounted for by features of psychopathology (e.g., symptom severity or Axis I comorbidity), and (c) evidence of differential expression of the disorder (e.g., chronicity) across subgroups. Accordingly, we first aimed to identify distinct, prototypical interpersonal subgroups in participants with MDD by applying latent profile analysis (LPA) to IPC octant scores. Second, we tested for differences on baseline depression symptom severity and Axis I comorbidity. Third, we examined interpersonal subgroup differences in MDD chronicity and functioning over a 10-year period while controlling for the presence of PD diagnosis. This study serves as an important first step in determining whether a specific interpersonal style is a reliable predictor of MDD course and outcome—over and above PD diagnosis—over a 10-year period. Identifying baseline characteristics predicting differential MDD outcomes are an important area of much needed research. If interpersonal style can account for some of the observed heterogeneity in MDD course, then further research on baseline assessments may prove useful in personalizing treatment interventions.

Method

Participants and Procedures

Study participants were drawn from the Collaborative Longitudinal Personality Disorders Study (CLPS), a multisite, prospective, naturalistic study designed to assess the course and outcome of 668 patients 18–45 years of age diagnosed with one of four PDs (schizotypal PD, borderline PD, avoidant PD, and obsessive compulsive PD) and a comparison group of patients diagnosed with current MDD but no PD.[1] Details of CLPS methods and participants have been previously reported (e.g., Gunderson et al., 2000).[2]

The current study includes 312 participants assessed over a 10-year period who met criteria for current MDD at baseline and completed the self-report measures (see Table 1 for demographic and clinical characteristics). Participants provided written informed consent. Interviewers were experienced clinicians with master's or doctoral degrees in mental health disciplines who underwent training across sites to achieve and maintain reliability in diagnostic measures. Participants were interviewed at baseline, 6 and 12 months, and yearly thereafter.

Table 2
Latent Profile Analysis Model Fit Indices and Entropy Statistic

Solution type	AIC	BIC	Entropy
One-profile solution	7,055.82	7,115.71	—
Two-profile solution	6,687.12	6,780.70	.80
Three-profile solution	6,542.97	6,670.23	.79
Four-profile solution	6,456.37	6,617.32	.82
Five-profile solution	6,390.84	6,585.48	.83
Six-profile solution	**6,351.22**	**6,579.54**	**.81**
Seven-profile solution	6,319.74	6,581.75	.84
Eight-profile solution	6,295.47	6,591.17	.83

Note. AIC = Akaike information criterion; BIC = Bayesian information criterion; Entropy = a measure of classification certainty, with values > .80 reflecting acceptable certainty. A dash indicates that no entropy is calculated for a one-profile solution (i.e., classification certainty is perfect by definition). Bold type indicates the preferred model. Nine-profile models failed to converge.

Measures

At baseline, interviewers administered the Structured Clinical Interview for *DSM–IV* Axis I Disorders–Patient Version (SCID-I/P; First, Spitzer, Gibbon, & Williams, 1996) to assess current and lifetime Axis I psychiatric disorders. The kappa coefficient for MDD interrater reliability was .80, and the test–retest kappa was .61 (Zanarini et al., 2000). Course of MDD was assessed using the Longitudinal Interval Follow-Up Evaluation (LIFE; Keller et al., 1987) across 12 assessments. The LIFE is a semistructured interview rating system for assessing the longitudinal course of mental disorders.[3] In this study, the LIFE measured the presence and severity of MDD over the 10-year follow-up period using weekly psychiatric status ratings (PSRs) ranging from PSR = 1 (*no symptoms*) to PSR = 6 (*severe symptoms and dysfunction*).[4] The LIFE also assesses monthly the Global Assessment of Functioning (GAF; American Psychiatric Association, 1994) scale ranging from 0 to 100.

The Diagnostic Interview for *DSM–IV* Personality Disorders (DIPD-IV; Zanarini, Frankenburg, Sickel, & Yong, 1996) assessed PD diagnosis at baseline. Participants also completed the self-report version of the NEO Personality Inventory–Revised Form R (NEO-PI-R; Costa & McCrae, 1992) at baseline. The current study used a scoring procedure for the NEO-PI-R that derives IPC octant

[1] Participants were assigned to a primary PD diagnostic group on the basis of a semistructured diagnostic interview (Diagnostic Interview for *DSM–IV* Personality Disorders; Zanarini et al., 1996) with support from at least one of two other PD instruments. The MDD comparison group consisted of participants who met criteria for current MDD according to the Structured Clinical Interview for *DSM–IV* Axis I Disorders–Patient Version (First, Spitzer, Gibbon, & Williams, 1996), had no more than two criteria of any PD diagnosis, and had less than 15 PD criteria in total.

[2] The CLPS co-occurrence patterns (e.g., Grilo et al., 2005) are similar to those reported for other clinical samples (Becker, Grilo, Edell, & McGlashan, 2000), thus increasing confidence in the generalizability of this sample to other clinical samples.

[3] The LIFE has served as the primary measure for major longitudinal studies of psychopathology (e.g., Bruce et al., 2005) and has demonstrated good-to-excellent reliability (Warshaw, Dyck, Allsworth, Stout, & Keller, 2001). The LIFE developers and official training staff at the Brown site trained and certified interviewers across sites and provided ongoing training and consultation for the interview and ratings. These methods maintain long-term reliability and prevent drift (Warshaw et al., 2001).

[4] The complete 6-point rating scale for MDD is as follows: PSR = 1, *no symptoms*; PSR = 2, *residual symptoms, but less than full diagnostic criteria*; PSR = 3, *mild symptoms, partial remission*; PSR = 4, *marked symptoms but not full diagnostic criteria*; PSR = 5, *symptoms meeting full diagnostic criteria*; PSR = 6, *severe symptoms and dysfunction*.

Table 3
Probability of Most Likely Latent Class Membership and Interpersonal Characteristics of the Groups

			Structural summary parameters				Circular statistics		
Group	*N*	Probability	Angle	Elevation	Amplitude	R^2	Circular *M*	Circular variance	95% circular CI
Whole sample	312		191.62°	−0.09	0.22	.32			
Group 1 (Extraverted)	69	0.87	35.86°	−0.08	0.99	.98	36.56°	22.11°	[31.34°, 41.77°]
Group 2 (Dominant)	10	0.93	91.53°	0.31	1.91	.97	90.76°	14.89°	[81.50°, 99.97°]
Group 3 (Arrogant)	60	0.87	127.55°	0.03	0.63	.95	127.47°	34.65°	[118.70°, 136.24°]
Group 4 (Cold)	29	0.90	194.68°	−0.13	1.4	.99	194.89°	14.72°	[189.53°, 200.25°]
Group 5 (Submissive)	54	0.84	256.33°	0.04	1.16	.98	253.94°	21.04°	[248.33°, 259.56°]
Group 6 (Unassuming)	90	0.87	307.76°	−0.03	0.62	.98	303.56°	33.89°	[296.58°, 310.58°]

Note. Probability in the table refers to the average latent class probability for most likely latent class membership. Angle = circumplex location of the predominant interpersonal trait in degrees; Elevation = average octant endorsement; Amplitude = a measure of profile differentiation; R^2 = interpersonal prototypicality; Circular *M* = the average of the angular displacements for each individual within the group; Circular variance = the dispersion of the angular displacements of individuals within a group around the circular mean; 95% circular CI = 95% circular confidence intervals that identify reliable differences in circular means.

scores (see Figure 1; Traupman et al., 2009).[5] In the current sample, Cronbach alphas for the NEO-PI-R IPC octants were .58 (JK; unassuming–ingenuous), .63 (HI; lazy–submissive), .67 (PA; ambitious–dominant), .69 (FG; aloof–introverted), .70 (LM; warm–agreeable), .73 (BC; arrogant–calculating), .74 (DE; cold–quarrelsome), and .78 (NO; gregarious–extraverted), consistent with prior research.

Data Analysis

LPA was conducted using Mplus 6 (Muthén & Muthén, 1998–2010) to classify depressed individuals into latent groupings based on their interpersonal profile. LPA is a person-specific technique that establishes latent groups of individuals who share a similar profile on a given set of observed variables. The IPC octant scales were used as the observed variables for the LPA models. Model fit was compared using the Akaike information criterion (AIC) and the Bayes information criterion (BIC), smaller values of which indicate better fit to the data.

The structural summary approach for circumplex data models an interpersonal profile of octant scores with a cosine-curve function. As Figure 1 shows, the parameters of this curve are its (a) angular displacement, (b) amplitude, and (c) elevation. The goodness-of-fit of the modeled curve to the actual scores can be evaluated by calculating an R^2 value, which quantifies the degree to which the profile conforms to prototypical circumplex expectations. Detailed descriptions of the structural summary, procedures for solving for the various parameters, and interpretive guidelines that relate each of these summary features to clinical hypotheses have been reported (Ansell & Pincus, 2004; Wright, Pincus, Conroy, & Hilsenroth, 2009).

External validation of interpersonal pathoplasticity was conducted, and analysis of covariance (ANCOVA) with Bonferroni post hoc analyses was employed to examine depression chronicity and functioning over the 10-year period while controlling for PD diagnosis.

Results

Using the structural summary method, an interpersonal profile was calculated for the sample of 312 depressed participants at baseline. The interpersonal profile of this sample was, on average, located in the DE octant (191.62°), reflecting a cold interpersonal style. However, the structural summary parameters of amplitude (0.22) and R^2 (.32) indicate that the overall group exhibits low interpersonal differentiation and prototypicality. Therefore, to test the nature of the interpersonal heterogeneity, participants' IPC octant scores were subjected to LPA. Models were estimated ranging from one to eight profiles. Table 2 summarizes model fit and entropy statistics. Six- and seven-profile solutions were given close consideration, and we retained a six-profile solution based on fit and subsequent circumplex analyses.[6] The entropy for the six-profile solution (0.81) suggested well-differentiated profiles for subsequent classification. The resulting subgroups of the six-profile solution were subjected to circumplex group comparison techniques (Wright et al., 2009; see Table 3). All groups exhibited highly

[5] Previous research by Traupman et al. (2009) identified a subset of NEO-PI-R items to identify IPC octants and established the internal consistency of the NEO-PI-R IPC octant scales and their goodness of fit to circumplex structure. Previous research using the NEO-PI-R IPC octant scales reported Cronbach alphas ranging from .58 (JK; unassuming–ingenuous) to .77 (BC; arrogant–calculating).

[6] As is commonly the case in LPA modeling, the AIC and BIC differ in the model they suggest is best. Moving vertically down the columns in Table 2, the AIC and BIC decrease as profiles are added (suggesting improved fit), with the BIC increasing again after 6. However, the increase to seven profiles is very small. Here, the BIC supports a model with fewer profiles compared to the AIC. This is due to the fact that the BIC provides a more conservative estimate of fit than the AIC because of the more stringent penalty imposed for more estimated parameters. The eight-profile solution resulted in some very small classes (i.e., less than 2% of the sample) and therefore was not given serious consideration. We closely examined the classes that emerged from the six- and seven-profile solutions using the circumplex modeling techniques. In the seven profile solution, a smaller (n = 8) Cold (DE [cold–quarrelsome] octant) class emerged that was not overlapping but highly redundant with a larger class. Therefore, we chose to retain the six-profile solution based on both fit and class structure.

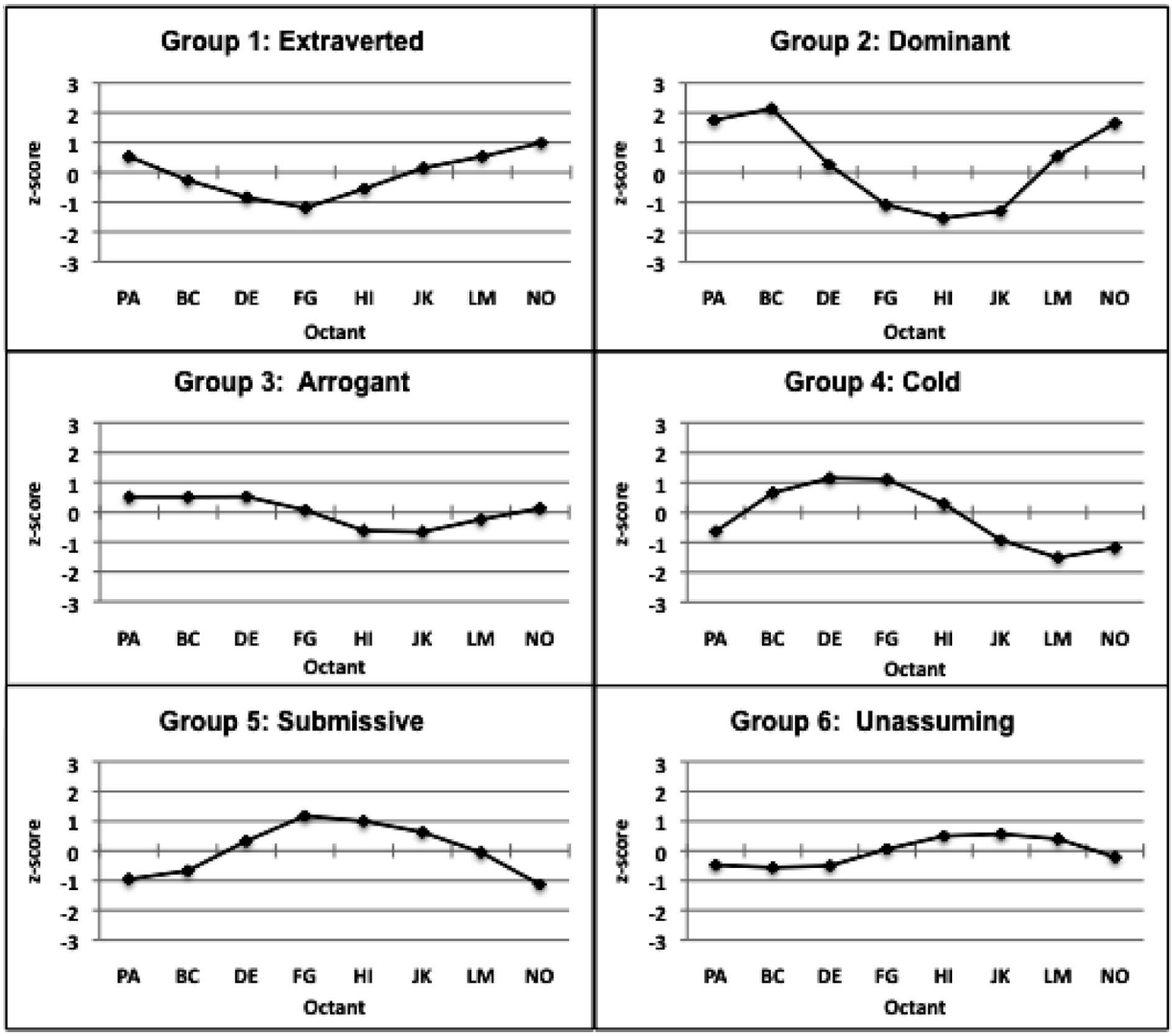

Figure 2. Circumplex structural summary profiles of the interpersonal subtypes in depression. *x*-axis = interpersonal circumplex (IPC) octant; *y*-axis = standard (*z*) score on the IPC octant of the NEO Personality Inventory–Revised Form R: PA (ambitious–dominant), BC (arrogant–calculating), DE (cold–quarrelsome), FG (aloof–introverted), HI (lazy–submissive), JK (unassuming–ingenuous), LM (warm–agreeable), and NO (gregarious–extraverted).

prototypical circumplex profiles (all R^2 values $>$ .90, and all amplitude values $>$ .60). Figure 2 provides a visual representation of the interpersonal profiles for each group. Figure 3 depicts the circumplex locations of the predominant interpersonal traits reported by the whole sample, as well as each interpersonal LPA group. For between-group statistical comparisons of interpersonal groups, circular means, circular variances, and 95% circular confidence intervals (CIs) were calculated for each group.[7] Table 3 presents the circular means, variances, and 95% CIs for the six interpersonal MDD groups. The angular CIs of the interpersonal groups do not overlap, demonstrating that individuals within each of these groups reported distinct interpersonal styles. For further evidence of interpersonal pathoplasticity, we compared the six interpersonal groups on Axis I comorbidity and baseline depression severity (see Table 4). There were no significant differences among the six groups on Axis I comorbidity or baseline depression sever-

[7] It is important to note that the angular locations of each group as defined by a circular mean will differ slightly from the angular displacement given by the structural summary method. The reason is that circular means are calculated using only angular locations and not the vector length from the origin of the circle. By not taking vector length into account, all angles are accorded equal weight in the equation. The structural summary method accounts for data that not only differ in angular location but also vector length, thus according differing weights to each participant's angle when calculating the overall displacement for the group. In defining groups based on circular statistics, some of the information given by the structural summary method is lost, but what is gained is the ability to statistically compare separate groups (Wright et al., 2009).

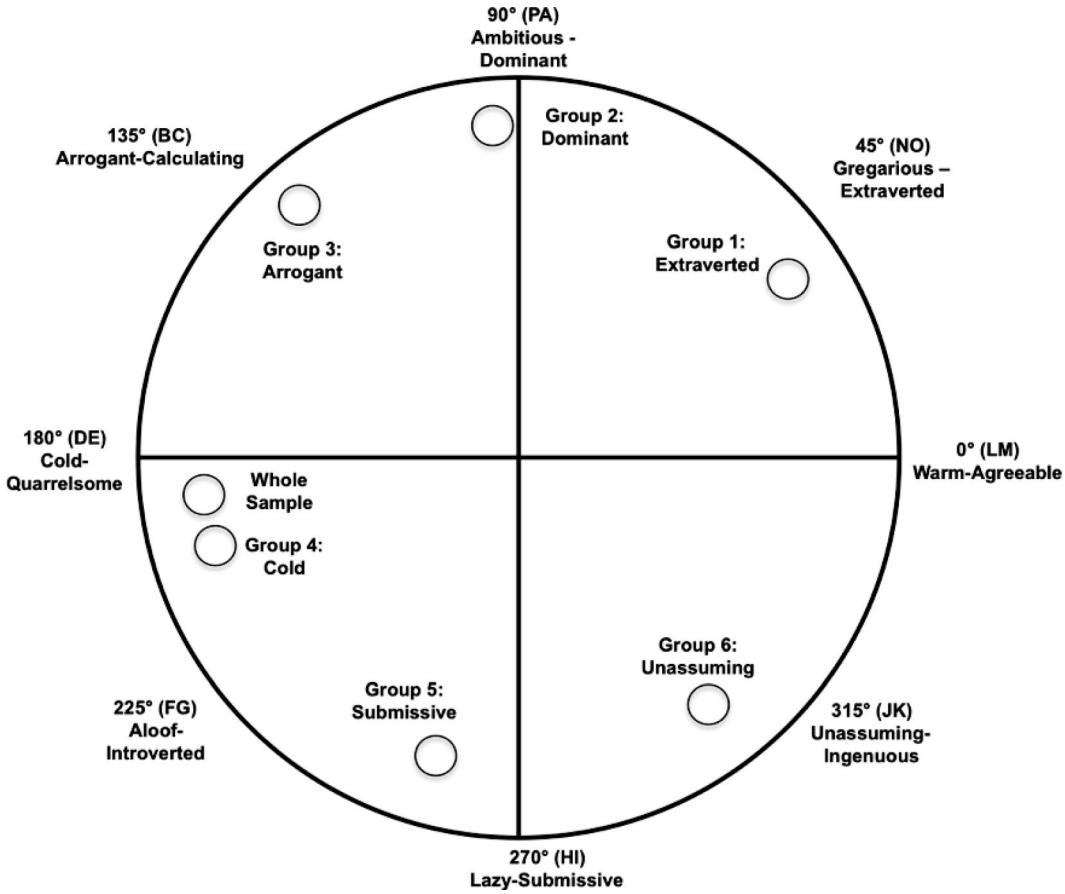

Figure 3. Circumplex locations of the predominant interpersonal trait reported by the interpersonal subtypes in depression. An example of the eight octants found in the interpersonal circumplex adapted from Leary (1957). Octants are labeled with the alphabetical notation originally provided by Leary (PA, BC, DE, etc.). Circumplex locations for the whole sample of depressed patients ($n = 312$) located at 191.62°; Group 1: Extraverted ($n = 69$) located at 35.86°; Group 2: Dominant ($n = 10$) located at 91.53°; Group 3: Arrogant ($n = 60$) located at 127.55; Group 4: Cold ($n = 29$) located at 194.68°; Group 5: Submissive ($n = 54$) located at 256.33°; and Group 6: Unassuming ($n = 90$) located at 307.76°. All circumplex locations are approximate.

ity, such as number of previous major depressive episodes, age of onset of MDD, and current MDD severity, providing support for interpersonal pathoplasticity in depression.

Finally, to demonstrate the incremental clinical value of assessing interpersonal traits along with *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM–IV*; American Psychiatric Association, 1994) diagnosis, we compared the six interpersonal groups on depression symptom chronicity as measured by number of weeks spent at a 5 or 6 on the LIFE PSR scale and on functioning as measured by number of months with a LIFE GAF score below 70 over the 10-year period. We performed between-subjects ANCOVAs controlling for the presence of PD diagnosis using a single dummy coded variable (0 = *no PD*, 1 = *PD*) with Bonferroni post hoc tests. There were significant group differences for chronicity after controlling for the effect of PD diagnosis, $F(5, 305) = 5.21$, $p < .001$, $\eta^2 = .08$ (see Table 5). The submissive group spent significantly more weeks at a 5 or 6 PSR ($\mu = 177.09$) compared to all groups except the cold group ($\mu = 166.69$). Similarly, we found significant group differences on functioning after controlling for the effect of presence of PD diagnosis, $F(5, 305) = 4.81$, $p < .001$, $\eta^2 = .07$ (see Table 5), with the submissive group spending significantly more months with a GAF score below 70 ($\mu = 52.13$) than the extraverted and unassuming groups.

Discussion

The current study represents an important step in identifying reliable predictors of MDD course and is the first to use IPC octants and LPA to examine interpersonal pathoplasticity in MDD course. The identification of six distinct, homogeneous interpersonal groups of depressed individuals that do not differ on baseline symptom severity provides evidence supporting the importance and applicability of interpersonal pathoplasticity in this clinical sample. Additionally, we found significant differences in depression symptom chronicity and on a measure of functioning, with individuals endorsing a submissive interpersonal style reporting a more chronic depressive course and poorer functioning over the

Table 4
Comparisons of the Interpersonal Subgroups in Depression on Diagnostic Comorbidity and Baseline MDD Severity

Variable	Group 1: Extraverted (n = 69)	Group 2: Dominant (n = 10)	Group 3: Arrogant (n = 60)	Group 4: Cold (n = 29)	Group 5: Submissive (n = 54)	Group 6: Unassuming (n = 90)	χ^2	df	V
Comorbidity, n (%)									
Mood disorders	3 (4.3)	2 (20.0)	15 (25.0)	6 (20.7)	18 (33.3)	11 (12.2)	1.58	10	.16
Anxiety disorders	6 (8.7)	1 (10.0)	12 (20.0)	6 (20.7)	9 (16.7)	26 (28.9)	2.37	20	.14
Alcohol/substance use disorders	11 (15.9)	1 (10.0)	8 (13.3)	4 (13.8)	8 (14.8)	21 (23.3)	1.63	10	.16
MDD melancholic type	23 (33.3)	2 (20.0)	21 (35.0)	9 (31.0)	22 (40.7)	28 (31.1)	2.79	5	.10
MDD atypical type	11 (15.9)	2 (20.0)	11 (18.3)	9 (31.0)	7 (13.0)	25 (27.8)	7.39	5	.16
MDD severity, M (SD)							$F(5, 306)$		η^2
No. of previous MDEs	40.96 (45.27)	25.70 (39.36)	46.93 (46.74)	46.97 (47.85)	46.83 (46.15)	46.14 (46.69)	0.54		.01
Age of onset	18.63 (7.81)	17.30 (9.56)	17.87 (8.93)	18.21 (7.30)	19.80 (10.08)	19.39 (10.00)	0.41		.01
Current severity	2.42 (1.41)	2.20 (1.55)	2.62 (1.40)	2.55 (1.30)	2.70 (1.18)	2.64 (1.15)	0.54		.01

Note. MDD = major depressive disorder; V = Cramer's V (measure of effect size in chi-square analysis); η^2 = measure of effect size in analysis of variance; Comorbidity = Axis I comorbidity diagnosed using the Structured Clinical Interview for *DSM–IV* Axis I Disorders–Patient Version (SCID-I/P); melancholic type and atypical type = specifiers of MDD assessed in SCID-I/P; MDD severity = baseline depression severity; MDE = major depressive episode.

Table 5
Mean Comparisons of the Interpersonal Subtypes in Depression on Depression Symptom Chronicity and Functioning Over a 10-Year Period While Controlling for the Presence of a PD Diagnosis

	Group 1: Extraverted (n = 69)	Group 2: Dominant (n = 10)	Group 3: Arrogant (n = 60)	Group 4: Cold (n = 29)	Group 5: Submissive (n = 54)	Group 6: Unassuming (n = 90)		
Variable	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	$F(5, 306)$	η^2
Chronicity	62.99_{c} (13.80)	$49.00_{b,c}$ (36.24)	$97.57_{b,c}$ (14.79)	$166.69_{a,b}$ (21.28)	177.09_{a} (15.60)	$114.84_{b,c}$ (12.08)	5.21*	.08
Functioning	30.45_{a} (2.52)	$32.70_{a,b,c,d}$ (6.62)	$43.03_{b,c,d}$ (2.70)	$50.17_{b,c,d}$ (3.88)	$52.13_{b,c}$ (2.85)	40.67_{d} (2.21)	4.81*	.07

Note. Chronicity is measured by the number of weeks spent at a 5 or 6 on the Psychiatric Status Rating scale. Functioning is measured by the number of months with a Global Assessment of Functioning score below 70. PD = personality disorder; η^2 = measure of effect size in analysis of covariance. Post hoc significant differences are noted by different subscripts.
* $p < .001$.

10-year follow-up period, even after controlling for the effects of PD diagnosis. This finding extends prior research on dependency and depression by clarifying the specific interpersonal style associated with the worst outcomes in prospective course and functioning within depression (e.g., Mongrain et al., 2004; Pincus & Wilson, 2001). A submissive interpersonal style may represent a fundamental risk factor for poorer outcomes in major depression, thus providing a first step toward identifying a reliable predictor for MDD course. Whereas Grilo et al. (2005, 2010) found that MDD combined with baseline PD pathology results in significantly longer time to remission from MDD, the current study delineates the specific interpersonal style, submissiveness, most associated with poorer MDD outcome, and establishes that interpersonal style increments PD pathology in predicting course of MDD symptoms and functioning.

Our results suggest that using the IPC model to assess interpersonal functioning may increment diagnostic categories in explaining heterogeneity in course of psychiatric disorder. The interpersonal styles associated with MDD are notably diverse (i.e., a single interpersonal style does not adequately describe the potential diversity in MDD presentation), and the average interpersonal style, cold/unaffiliative, is not the interpersonal style associated with the poorest outcome. These findings highlight the importance of examining the pathoplastic expression of interpersonal style within depression and the incremental information garnered by examining outcomes at the interpersonal level, rather than by diagnosis alone. Further research is needed to determine whether interpersonal heterogeneity is associated with pathoplastic effects on functioning across diagnoses.

The current study and its conclusions have several limitations. First, the majority of participants had a co-occurring PD diagnosis, limiting generalizability to MDD samples without co-occurring PD pathology. However, we believe this heterogeneity may accurately reflect the variety of interpersonal functioning found in treatment-seeking patients with MDD. Second, two of the subgroups identified by LPA had a small number of participants (e.g., dominant subgroup = 10; cold subgroup = 29). Despite limited statistical power, we nonetheless detected large effects across our chronicity and functioning analyses; however, future studies should include a larger sample size to ensure that each interpersonal group has an adequate number of participants. Third, this study used a naturalistic design of treatment-seeking individuals, yielding greater variability among participants than what a controlled treatment protocol might offer. However, our findings may not generalize to depressed individuals who are not treatment-seeking or who refuse to participate in research. The ethnic composition of our sample was mostly Caucasian (73.7%) and female (63.8%); however, we highlight that the ethnic distribution of our participants reflects the geographic areas sampled, and our gender distribution reflects treatment-seeking populations. Finally, although well-validated and reliable, the LIFE methodology may be vulnerable to bias or inaccurate recall of symptoms.

In conclusion, our results identify six distinct, interpersonally prototypical groups in MDD. The six distinct groups reported differential depression symptom chronicity and differential functioning over a 10-year follow-up period not attributable to differences in symptom severity or diagnostic comorbidity. These findings indicate that interpersonal style may account for some of the heterogeneity observed in the course of MDD. Future studies of MDD should integrate analyses testing interpersonal styles as predictors and moderators of outcomes and should investigate psychotherapy interventions that specifically target at-risk interpersonal styles in depressed patients. Baseline assessments of interpersonal style may inform personalized interventions targeting specific interpersonal mechanisms thereby reducing the chronicity of depressive symptoms and improving functioning over time. For example, depressed patients with a submissive interpersonal style may require a therapeutic focus on assertiveness skills and encouragement for self-direction before undertaking behavioral activation to reduce depressive symptom chronicity and improve functioning. Accounting for distinct interpersonal styles underlying a common Axis I diagnosis may improve treatment and outcome across diagnoses.

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