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Heterogeneity of interpersonal problems among depressed young adults: Associations with substance abuse and pathological personality traits

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Abstract

This study extended previous theory and research on interpersonal heterogeneity in depression by identifying groups of depressed young adults who differ in their type and degree of interpersonal problems, and by examining patterns of pathological personality traits and alcohol abuse among these groups. We examined the interpersonal problems, personality traits, and alcohol-related problems of 172 college students with at least moderate levels of self-reported depression on the Patient Health Questionnaire (Spitzer, Kroenke, & Williams, 1999). Scores from the Inventory of Interpersonal Problems – Short Circumplex (Soldz, Budman, Demby, & Merry, 1995) were subjected to latent profile analysis, which classified individuals into five distinct groups defined by the types of interpersonal problems they experience (dominant, warm, submissive, cold, and undifferentiated). As hypothesized, groups did not differ in depression severity, but did show predicted patterns of differences on normative and maladaptive personality traits, as well as alcohol-related problems. The presence of clinically meaningful interpersonal heterogeneity in depression may have important implications for designing more individualized treatments and prevention efforts for depression that target diverse associated interpersonal problems.

Keywords

depression; personality; interpersonal problems circumplex; pathoplasticity; latent profile analysis; diagnostic heterogeneity; alcohol

Major depression is one of the most common, distressing, and costly illnesses worldwide (World Health Organization, 2002). Risk for depression is increased during young adulthood (Furr, Westefeld, McConnell, & Jenkins, 2001) due to both the normative course of temperamental risk factors (Hopwood et al., 2011) and environmental stressors associated with young adulthood (Westefeld & Furr, 1987). According to the 2008 National College Health Assessment survey, one in three undergraduates reported “feeling so depressed it was difficult to function” at least once in the past 12 months (ACHA-NCHA, 2008). Depression among young adults impairs relationship functioning, work functioning, quality of life, and mortality (Beck & Alford, 2009; Friis, Wittchen, Pfister, & Lieb, 2002; Furr et al., 2001; Kendler, Karkowski, & Prescott, 1999; Pearlin & Johnson, 1977; Westefeld & Furr, 1987). Subclinical depression—a condition in which a person has symptoms of depression but fails to meet diagnostic threshold for a depressive disorder—has similar negative consequences

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for a young adult's quality of life (Gollust, Eisenberg, & Golberstein, 2008; Hill & Kemp-Wheeler, 1986; Kisch, Leino, & Silverman, 2005; Mackenzie et al., 2011).

Depressed individuals tend to differ in the kinds of interpersonal problems they experience (e.g., Cain et al., 2012). Better understanding the heterogeneity in interpersonal problems among depressed individuals would allow for the identification of risk for other problematic outcomes, such as alcohol abuse and pathological personality features. For example, young adults with problems related to dominance have been found to have a higher rate of antisocial personality disorder and alcohol problems, whereas those with problems related to submissiveness tend to have higher rates of dependent personality disorder (Matano & Locke, 1995; Pincus & Wiggins, 1990). Thus, understanding heterogeneity in interpersonal problems among depressed individuals may be clinically useful in indicating other kinds of problems.

Individual Differences in the Expression of Depression

The differential expression of depressive symptoms can impede the identification of the disorder and frustrate efforts to prevent or treat it (Clark, Watson, & Reynolds, 1995). As 'one-size-fits-all' treatments may fail to address the significant heterogeneity among depressed individuals, several theorists have advocated tailoring treatments of depression to individuals who express it differently. For example, Beck (1983) proposed distinguishing between autonomous and sociotropic depressed individuals. Autonomous individuals are oriented by need for achievement, independence, and mobility, and are presumed to become prone to depression when they believe they have failed in these areas. Conversely, sociotropic individuals have a strong need for close relationships, sharing, and affiliation, and are sensitive to interpersonal deprivation or exclusion. Essentially, Beck proposed that individuals who are either autonomous or sociotropic are likely to present differently when depressed, and these differences may have important implications for the course, correlates, and effective treatment of depression.

Blatt's (1974, 1991) psychoanalytic theory of depression is similar to Beck's (1983) in articulating two dimensions that depict the variability in depressed patients. He labeled these dimensions introjective (or self-critical, like Beck's autonomy) and anaclitic (or dependent, like Beck's sociotropy). Self-critical individuals are characterized by concerns of self-worth and self-definition, and are disposed to feel guilty when they fail to meet their unrealistically high personal expectations. Dependent individuals are characterized by interpersonal concerns related to approval and care, and are inclined to feel helpless and to fear rejection in social relationships. Significantly, both Beck's cognitive and Blatt's psychoanalytic models are organized by depressed person's interpersonal motives, behaviors, and attributions rather than the severity or type of depression symptoms the individual exhibits (Blatt & Zuroff, 1992).

An Interpersonal Model of Heterogeneity among Depressed Individuals

It would seem worthwhile to take advantage of the apparent similarity of these models toward the development of an integrative framework for individual differences in interpersonal manifestations of depression (Pincus, 2005; Wiggins, 2003). Interestingly, the dimensions in Beck's (1983) and Blatt's (Guisinger & Blatt, 1994) models bear a strong resemblance to two dimensions—agency and communion—that are considered by interpersonal theorists to be fundamental for describing social behavior in general (Wiggins, 1991). The dimension of agency (dominance to submission) refers to individual differences in individuality, separation, dominance, and self-determining achievement, whereas the dimension of communion (warmth to coldness) articulates variability in affiliation and the sense of closeness and belonging to others.

The interpersonal circumplex (IPC; Leary, 1957) defines the interpersonal behavior, strengths, weaknesses, and attributions of an individual or group based on the combination of warmth and dominance it reflects (see Figure 1). Previous research suggests that one's placement in the IPC has implications for the expression of other personality features (Kiesler, 1996; Slaney, Pincus, Uliaszek, & Wang, 2006; Wright, Pincus, Conroy, & Elliot, 2009), treatment response (Salzer et al., 2010), and the course of depression (Cain et al., 2012). Moreover, groups with the same clinical diagnosis, such as generalized anxiety (Przeworski et al., 2011; Salzer et al., 2008), social phobia (Kachin, Newman, & Pincus, 2001), and bulimia nervosa (Ambwani & Hopwood, 2009) tend to array around the entire circle. Importantly, in these studies various groups tend to have the same overall amount of interpersonal problems, suggesting that their location in the space defined by the IPC provides incremental clinical information about patients that is not provided by diagnosis alone.

This finding has two important implications for psychiatric taxonomy and clinical practice. First, the IPC can be used to identify depressed individuals with various combinations of communal and/or agentic tendencies. Thus the IPC may offer a more comprehensive model of individual differences in interpersonal functioning among individuals with depression than is provided by models, such as Beck's or Blatt's, that propose two types. This is important because increased specificity in the heterogeneity among depressed individuals may allow for more nuanced clinical predictions. For instance, some disorders, particularly the personality disorders, are associated with particular interpersonal behaviors and problems (Pincus & Wiggins, 1990). Thus, the assessment of interpersonal behavior allows clinicians to make inferences about underlying personality features and risks for personality disorders among depressed individuals. Alcohol abuse may also be associated with particular interpersonal styles, such as dominance (e.g., Markey, Markey, & Tinsley, 2005). Given the importance of personality pathology (Trull, Ueda, Conforti, & Doan, 1997) and alcohol abuse (Knight et al., 2002) for college student functioning; this pattern of findings implies that some young adults with depression are more at risk for dysfunction than others, despite similar levels of depression.

That individuals with a wide range of pathology can be categorized using the IPC also suggests that heterogeneity in interpersonal functioning (i.e., symptom expression and maintenance) among depressed individuals may generalize to other diagnoses. Thus, the IPC can be understood to provide a transdiagnostic model for understanding individual differences in interpersonal dysfunction within most forms of psychopathology. Such an understanding could augment clinical practice. For instance, some evidence suggests that interpersonal style is related to treatment response (Constantino et al., 2012; Salzer et al., 2010). This indicates that there may be clinical potential in matching treatment approaches to patient's transdiagnostic interpersonal style in addition to matching treatment to their psychiatric diagnosis. Indeed, evidence-based models of effective psychotherapy process based on the interpersonal patterns that occur between clinician and client appear to apply regardless of diagnosis or therapeutic orientation (Tracey, Sherry, & Albright, 1999; Tracey, 1993).

Cain et al. (2012) identified six groups of depressed individuals who did not vary in depression severity or age of onset but did differ in interpersonal style. Relative to other groups, individuals with a submissive interpersonal style had more chronic depression and poorer functioning over a 10-year follow-up. These findings suggest that specific interpersonal styles such as submissiveness may represent important risk factors for predicting the course of MDD symptoms and dysfunction above and beyond MDD symptom severity (Cain et al., 2012). Overall, the IPC has the potential to offer valuable information that would supplement the diagnosis of depression for predicting clinical functioning.

Unlike most previous research on interpersonal heterogeneity among individuals with clinical disorders, the study by Cain et al. (2012) focused on interpersonal traits as opposed to interpersonal problems. Someone with a particular interpersonal style may not necessarily manifest interpersonal problems that correspond with the same interpersonal trait (Hopwood, Koonce, & Morey, 2009). For instance, a person may be warm and appropriately assertive generally, but under stress may become hostile and domineering. The advantage of an interpersonal problems measure is that it can assess the kinds of interpersonal problems a person experiences most frequently as well as the severity of interpersonal dysfunction a person experiences. Therefore, the examination of interpersonal problems, in addition to traits, can augment previous research by developing a better understanding of interpersonal heterogeneity in depression.

The Current Study

To extend previous research, we sampled college students above a recommended clinical cut score on a self-report measure of depression to determine the heterogeneity in interpersonal problems in this population and its relevance for understanding personality features and risk for alcohol problems. We examined personality and alcohol abuse for two reasons. Depression has been linked to student drinking, with some research suggesting a causal relationship among subsets of college student drinkers who drink to cope with depression (Aneshensel & Huba, 1983; Camatta & Nagoshi, 1995; Gonzalez, Reynolds, & Skewes, 2011; Kushner & Sher, 1993; Park & Levenson, 2002; Wood, Nagoshi, & Dennis, 1992). It has been estimated that 84% of college students drink alcohol with 25% drinking at least once per week (Fromme & Corbin, 2004), and research has shown that drinking behavior may lead to problems of its own, including academic trouble, legal problems, unplanned sexual activity, and personal injuries (e.g., Syre, Pesa, & Cockley, 1999; Wechsler, Dowdall, Davenport, & Castillo, 1995). Therefore more effectively identifying college students at risk for depression-related drinking may help address the problem of student drinking. We propose, given the association of certain kinds of interpersonal problems to substance abuse (Matano & Locke, 1995) that interpersonal problems may be a key variable for predicting which depressed students are at greatest risk for alcohol abuse.

Depression is associated with personality pathology in general (Fava et al., 2002), but individuals with different interpersonal problems may also be at risk for different personality disorders, given robust evidence regarding the links between interpersonal style and personality disorders (Pincus & Wiggins, 1990). Thus, identifying depressed students with particular kinds of maladaptive interpersonal functioning may pinpoint those at risk for the development of certain personality disturbances. On the basis of the studies we previously described, we predicted that depressed young adults would vary in the types of interpersonal problems they experience. We further predicted that this heterogeneity would not be explained by depression severity, but that it would be linked to risk for alcohol abuse and personality disorders.

Given our general expectation that groups would be identified across the IPC, we also made specific predictions about how these groups would tend to differ in terms of personality traits and alcohol problems. We evaluated two personality trait models. The Five Factor Model (FFM; McCrae & Costa, 1990) is currently the most well-established trait model in personality psychology and provides a fairly comprehensive depiction of broad individual differences in stable, normative behavioral tendencies (Costa & McCrae, 1994), as well as systematic links to personality disorders (Samuel & Widiger, 2008). Among FFM traits, extraversion and agreeableness consistently relate to interpersonal style (Costa & McCrae, 1980; McCrae & Costa, 1989), whereas the neuroticism, openness, and conscientiousness do not. We therefore predicted that, among FFM traits, only extraversion and agreeableness

would differ across interpersonal groups. Specifically, we expected extraversion to be highest in groups characterized by high warmth and dominance and agreeableness to be highest in groups characterized by high warmth and low dominance.

Given that the focus of the FFM is on normal personality traits but the clinical relevance of interpersonal heterogeneity in depression involves evaluating risk for personality disorders, we also sought to evaluate group differences using a pathological trait system. We examined the DSM-5 pathological trait model, which depicts 25 traits proposed to capture phenotypic heterogeneity in the expression of personality disorders (Krueger, Derringer, Markon, Watson, & Skodol, 2012; Krueger et al., 2011). Initial research suggests that the higher order structure of these traits is organized by five factors that bear a strong resemblance to the FFM (Krueger et al., 2012; Krueger et al., 2011; Wright et al., 2012b; Thomas et al., 2012). We accordingly predicted that the DSM-5 domains would show a similar pattern to the FFM with respect to interpersonal groups. We also made facet-level predictions for the DSM-5 model. For instance, we did not expect interpersonal groups to differ in depressivity given our general expectation that depressive features would not be associated with a particular interpersonal style (Wright et al., 2012a). We likewise did not expect distractibility, which is more cognitive than interpersonal and is symptomatic of depression, to differ across interpersonal groups. In contrast, we expected manipulativeness, deceitfulness, and callousness to differ among interpersonal groups because these traits tend to be associated with cold-dominance. Similarly, we hypothesized that groups high in cold and dominant interpersonal problems would have greater alcohol-related problems given research on the association of externalizing problems with cold-dominant (antagonistic) personality features (Krueger, 1999; Markey, Markey, & Tinsley, 2005).

Method

Participants

Participants were drawn from a larger sample of 808 undergraduates at a large Midwestern University who completed self-report questionnaires online for course credit. We selected participants whose self-reported depression score was at least 10 (selected range = 10 – 27, $M = 22.94$, $SD = 3.62$), signifying the presence of moderate to severe depression (Kroenke & Spitzer, 2002). This resulted in a final sample of 172 participants (71.50% females, 28.50% males), who ranged in age from 18 to 33 years ($M = 20.10$, $SD = 2.11$). The ethnic make-up of the sample was as follows: 75.00% Caucasian, 6.40% Asian American, 5.81% African American, 12.21% reported other ethnicities and .58% did not report ethnicity.

Measures

The *Patient Health Questionnaire* (PHQ-9; Spitzer, Kroenke, & Williams, 1999) is a nine-item self-report questionnaire used to screen and diagnose depression. For each item (e.g., “Feeling down, depressed, or hopeless”), response options range from “Not at all” (0) to “Nearly every day” (3) on a four-point Likert scale. Sensitivity (88%) and specificity (88%) for major depression were both found to be high at a PHQ-9 cut-off of 10 using the Mental Health Professional Interview as a criterion measure of depression (Kroenke, Spitzer, & Williams, 2001). Cronbach’s alpha for the PHQ-9 was .89 in the full sample.

The *Inventory of Interpersonal Problems – Short Circumplex* (IIP-SC; Soldz, Budman, Demby, & Merry, 1995) is a 32-item self-report measure of interpersonal problems that has been validated in college students (Hopwood, Pincus, DeMoor, & Koonce, 2008). These items describe interpersonal behaviors which participants report that they find “hard to do” or that they “do too much.” There are eight four-item scales arrayed around the IPC structured by the two dimensions of agentic and communal problems (see Figure 1). The

internal consistency of the IIP-SC scales ranged from .63 to .80 (Mdn $\alpha = .72$). The mean IIP-SC elevation score was higher than average ($M = .42$, $SD = .56$, where the average in students is 0.00; c.f. Hopwood et al., 2008), suggesting a level of interpersonal dysfunction that might be expected from a depression-selected group (e.g., Barrett & Barber, 2007).

The *Five Factor Model Rating Form* (FFMRF; Mullins-Sweatt, Jamerson, Samuel, Olson, & Widiger, 2006) is an abbreviated measure of the Five Factor Model (FFM) of personality. The FFMRF has one item for each of the 30 FFMRF facets, which are rated using a 5-point Likert scale with trait descriptive adjective anchors for both high and low scores. These facets were summed to derive domain scores, which had internal consistencies as follows: neuroticism=.61, extraversion=.67, openness=.69, agreeableness=.70 and conscientiousness=.74.

The *Personality Inventory for DSM-5* (PID-5; Krueger et al., 2012) is a 220-item self-report questionnaire that measures the proposed DSM-5 traits on a four-point response scale. This measure has 25 primary scales that map onto five higher-order dimensions: negative affectivity, detachment, antagonism, disinhibition, and psychoticism (Krueger et al., 2012; Thomas et al., 2012; Wright et al., 2012b). The internal consistency of the scales ranged from .61–.94 in the full sample (Mdn $\alpha = .82$). The scales of the PID-5 were scored by averaging the items.

The *Alcohol Use Disorder Identification Test* (AUDIT; Saunders, Aasland, Babor, De La Fuente, & Grant, 1993) is a self-report measure of an individual's harmful use of alcohol in the past year (Kokotailo et al., 2006). Scores were obtained by summing items. Cronbach's alpha for the AUDIT was .80.

Data Analysis

We conducted a latent profile analysis (LPA) using Mplus 6.1 (Muthén & Muthén, 2010) to classify depressed individuals into distinct interpersonal problems groups. LPA is a person-oriented analytic technique that determines underlying (i.e., latent) groups of individuals who share similar profiles on designated observed variables. This LPA model used IIP-SC octant scores (i.e., PA, BC, DE, FG, HI, JK, LM, & NO; see Figure 1) as the observed variables. Bayesian Information Criteria (BIC) and Akaike Information Criteria (AIC), with small sample correction (AIC_c; Burnham & Anderson, 2004), were used to evaluate models with different numbers of classes and to select a final model (Nylund, Asparouhov, & Muthén, 2007). Given that BIC places a higher value on parsimony, we chose to use BIC in selecting the best-fit model. We also evaluated entropy, which served to indicate whether subsequent analyses with individuals assigned to the most likely class were warranted (Clark & Muthén, 2009). A high entropy value (>.80) indicates an acceptable classification of individuals (Burnham & Anderson, 2004).

The structural summary method for circumplex data developed by Gurtman and Balakrishnan (1998) was used to examine the nature and level of interpersonal problems in each group. This approach models the pattern of octant scores from the group-average interpersonal profile as a cosine-curve function (Figure 2). The parameters of this curve are its (a) *angular displacement*, or the angular shift from 0° for the peak of the curve; (b) *elevation*, or mean level of octant scores; and (c) *amplitude*, or the variability across octant scores. Interpretive guidelines that link each of these summary features to clinical hypotheses have been provided by Gurtman & Balakrishnan (1998) and Wright, Pincus, Conroy, & Hilsenroth (2009). The *angular displacement* indicates a person's primary or most prominent interpersonal style (Kiesler, 1996). Displacement values are only interpretable when the pattern of octant scores conforms to circumplex assumptions. We thus evaluated the prototypicality (i.e., goodness-of-fit) and profile differentiation of the

overall sample and each subgroup using the structural summary approach to determine whether structural summary parameters were interpretable. The R^2 , or goodness-of-fit to the cosine-curve model, was calculated to indicate the degree to which the profile conforms to circumplex expectations (Wright et al., 2009). A good fit demonstrates that the profile can be efficiently described by its parameters as opposed to all eight octant scores. In other words, a high R^2 value ($>.80$) indicates a group with high interpersonal prototypicality. A low R^2 ($<.80$) may be suggestive of an interpersonally heterogeneous group, which can be assessed directly with angular variance. We calculated variances and 95% circular confidence intervals (CI) for displacement values to test whether groups with R^2 values $>.80$ overlapped in terms of prominent interpersonal problems (Wright et al., 2009). We also estimated amplitude and elevation values for these groups in order to compare them in terms of the specificity of interpersonal problems and overall distress, respectively. Finally, we compared mean differences across IIP-SC defined groups on FFMRF, PID-5, and AUDIT scales using a series of one-way analyses of variance (ANOVA) with Duncan's post hoc tests.

Results

Structural summary parameters were computed for the average interpersonal problems profile of 172 depressed young adults. As expected, the R^2 (.77) value indicated low interpersonal prototypicality, suggesting the potential existence of more homogeneous subgroups. We therefore used LPA to classify individuals with depression into distinct groups based on IIP-SC octant scores. A five profile solution was selected based on BIC (see Table 1). Additionally, the AIC_C was within a value of 2, suggesting that there is substantial support for the 5-class model by either metric (Burnham & Anderson, 2002). These groups were labeled dominant, warm, submissive, cold, and undifferentiated (see Figure 1) based on their structural summary parameters (Table 2). Four of the five IIP-SC subgroups demonstrated interpersonal prototypicality (i.e., $R^2 > 0.86$) and varied significantly in terms of angular displacements (i.e., dominant, warm, submissive, and cold). Conversely, the relatively low amplitude and R^2 values of the fifth group limit the interpretive value of the displacement parameter, justifying the label 'undifferentiated'. Unlike the other groups, which were quite similar in terms of interpersonal distress, the elevation parameter was also lower for the undifferentiated group. Overall this pattern suggests that, whereas members of the first four groups endorsed a specific pattern of interpersonal problems that varied about the IPC, the undifferentiated group can be characterized as reporting relatively few, non-specific interpersonal problems. Based on the high entropy value (.86), we classified individuals using the model estimated posterior probabilities to their most likely class.

We next compared normative and maladaptive traits across groups (Table 3). As predicted given robust relations between extraversion and agreeableness with interpersonal styles (Costa & McCrae, 1980; McCrae & Costa, 1989), these traits showed significant differences across interpersonal groups. Specifically, individuals who reported problems related to warmth and dominance tended to have higher levels of extraversion and individuals with problems related to warmth tended to have the highest level of agreeableness compared to other groups. Also as expected, groups did not significantly differ from each other with regard to neuroticism, openness, or conscientiousness.

A series of one-way between groups ANOVAs revealed that the five interpersonal subgroups significantly differed from one another in regards to three of the five higher-order PID-5 trait domains: antagonism, detachment, and disinhibition (Table 3). Differences for antagonism and detachment corresponded to effects seen for FFM domains, whereas

disinhibition differed significantly across IIP-SC groups, thus distinguishing the pathological trait model from the normative trait model.

In terms of primary pathological traits, both submissiveness and anxiousness were highest in both warm and submissive groups. Hostility and restricted affectivity were highest in the cold group, and separation insecurity was highest in the cold group. Withdrawal and anhedonia were highest in the cold and submissive groups, whereas intimacy avoidance was highest in the dominant group. Antagonism and its related traits of manipulateness, deceitfulness, and callousness were highest in the cold group. Meanwhile, attention-seeking and grandiosity were lowest in the submissive group. As expected, groups did not differ in depressivity or distractibility, two traits with strong links to depression. Disinhibition traits, including irresponsibility, impulsivity, and risk taking, were highest in the dominant group, as were unusual beliefs.

Finally, we compared alcohol-related problems across interpersonal groups (Table 3). The one-way between groups ANOVA indicated that IIP-SC groups significantly differed from one another with regards to alcohol abuse. Specifically, the dominant group tended to have higher rates of alcohol-related problems, whereas the submissive group tended to have the least amount of alcohol problems. The warm, cold, and undifferentiated groups did not differ from each other on alcohol abuse.

Discussion

The purpose of this study was to examine interpersonal problem heterogeneity in a sample of depressed college students and to explore personality trait and alcohol abuse differences among interpersonal groups. We identified five groups (dominant, warm, submissive, cold, and undifferentiated) of depressed individuals that did not differ in depressive severity but did differ in the nature of characteristic interpersonal problems. Cain and colleagues (2012) identified six groups with different interpersonal styles (extraverted, dominant, arrogant, cold, submissive, and unassuming), and no significant differences between interpersonal groups were found in depressive symptom severity in that study either. Although the number of groups were somewhat different, this may have been due to sampling or measurement variability, and the broader point is that in both studies depressed individuals array around the circle whether they represent an older and more clinically severe population measured by interpersonal traits or a non-clinical young adult population measured by interpersonal problems.

The findings in the present study support previous literature suggesting that interpersonal functioning provides a useful means for depicting the heterogeneity among individuals with depression (Cain et al., 2012) and extends this observation to a sample of depressed young adults. The identified interpersonal subgroups also significantly differed from each other in terms of normative and maladaptive personality features, as well as alcohol-related problems, supporting the clinical relevance of demarcating subgroups of young adults with depression.

The Dominant Group

Individuals in the dominant group were more likely to have alcohol-related problems and to engage in impulsive, irresponsible, and attention-seeking behaviors than members of other groups. These individuals may tend to be aggressive or irritable when under stress, such as when others challenge or provoke them. Previous research suggests modest to moderate associations between depression and aggressive or impulsive behavior (Apter et al., 1990; Perroud, Baud, Mouthon, Courtet, & Malafosse, 2011); the current results may suggest a subgroup of depressed individuals who are particularly at risk for such behaviors.

The Warm Group

We found that depressed individuals who tend to have problems related to excessive warmth were more likely to be friendly, sociable and outgoing, and to have concerns about rejection and approval by others. Overall this pattern suggests that the predominant concerns among such individuals may involve separation from individuals in their support network. We also found that individuals in the warm group were more likely to experience anxiety and separation insecurity relative to the other groups. This pattern of results may suggest that warm depressed individuals tend to internalize negative affects rather than expressing them to others, a strategy for maintaining close bonds which may have negative personal consequences.

The Submissive Group

Individuals in the submissive group reported being least likely to draw attention toward themselves or reach out to others. They were also relatively anxious and unlikely to engage in potentially harmful or dangerous behaviors. This pattern suggests that depressed individuals who report interpersonal problems related to submissiveness may tend to see themselves as inferior to others and to behave in a manner that avoids social risks. One could infer from this pattern that someone with these sorts of personality features may be become depressed when others blame them or hurt their feelings in some way, and that such problems would persist to the degree that submissive individuals are unlikely to confront others about this sort of behavior.

The Cold Group

Individuals in the cold group were relatively more likely to manipulate others and enjoy taking advantage of others' weaknesses, deliberately lie to others, and show little interest in or regard for others' feelings or relationships in general than members of other groups. This pattern suggests that depressed individuals with cold problems may tend to lash out at or distance themselves from others during negative mood states, and that efforts by others to support or become close to them may actually worsen distress, symptoms, and maladaptive behavior.

The Undifferentiated Group

Unlike the other groups, the undifferentiated group had relatively few interpersonal problems, and could not be well-characterized in terms of any particular type of problem. It is possible that individuals in this group experience conflictual patterns of interpersonal problems (e.g., being both too warm and too cold) that average to a middling value. Clinically, it is generally worth investigating the specific pattern of octant scores and item responses for individuals that do not have interpretable structural summary coefficients, such as may be the case with a sizeable proportion of this group.

Clinical and Research Implications

Overall, these results have a number of clinical implications. A primary implication is the utility of interpersonal problems for understanding clinically relevant individual differences among individuals with depression. Particular subgroups may be at risk for certain kinds of associated problems. For instance, depression and alcohol abuse commonly occur together among college students (e.g., Wood et al., 1992). In the present study, we found a significant correlation between depression scores (as measured by the PHQ) and alcohol problem scores (as measured by the AUDIT) for the total sample ($r = .29, p < .001$). These findings suggest that some, but not all depressed persons, experience alcohol-related problems. The likelihood of depressed individuals experiencing alcohol-related problems may in part be identified by interpersonal problems related to dominance.

In general, research using interpersonal assessments to understand individual differences among individuals with shared diagnoses has been generative (Ambwani & Hopwood, 2009; Barrett & Barber, 2007; Borkovec, Newman, Pincus, & Lytle, 2002; Cain et al., 2012; Cain, Pincus, & Holtforth, 2010; Constantino et al., 2008; Constantino et al., 2012; Kachin, Newman, & Pincus, 2001; Przeworski et al., 2011; Salzer et al., 2008; Thomas et al., in review; Wright et al., 2009). Given the typical finding that individuals with many disorders experience a wide range of interpersonal styles and problems, and that these interpersonal differences are likely to influence symptom expression and treatment, this research points toward the possibility of transdiagnostic treatment principles based on interpersonal functioning. For example, Tracey and colleagues (1994, 1999) have found a particular treatment process tends to be associated with successful treatment across diagnoses and treatment orientation. This approach involves supporting the client's interpersonal style to develop an alliance, subsequently challenging that style to effect change, and then resolving the relationship with a smoother, more complementary interaction pattern. Employing this evidence-based strategy may heighten the impact of other evidence-based techniques, but it is only possible with an initial assessment of interpersonal functioning.

It is also possible that young adults with depression but with different interpersonal problems may differentially benefit from certain treatment goals and techniques. For instance, someone with depression who has a cold interpersonal style may benefit greatly from learning how to obtain and maintain social support given their tendency to be withdrawn from others. Conversely, someone who is warm and tends to be drawn to social networks may gain more in therapy by learning how to become more independent and less emotionally dependent on others. Overall, the finding of interpersonal heterogeneity in depression suggests the potential for developing and tailoring individualized treatment and prevention. Future research should explore the clinical implications of interpersonal heterogeneity in depression and other disorders.

A consideration of interpersonal heterogeneity may also benefit research on the etiology of depression, as there may be different pathways to depression for individuals with different interpersonal styles (see Ambwani & Hopwood, 2009). For example, findings in this study suggest that depressed young adults with interpersonal problems related to dominance may become more prone to alcohol abuse, raising the possibility that such alcohol-related problems may lead to further depression. Likewise, temperament models suggest that high neuroticism and low extraversion predispose depression (reviewed by Clark, Watson, & Mineka, 1994); however, given that these FFM traits are elevated in different interpersonal groups, depression may have a stronger effect on individuals with a particular interpersonal style. Future research should explore the etiological implications of interpersonal heterogeneity in depression and other forms of psychopathology.

Given that only a small percentage of depressed young adults seek counseling services even though college campuses often provide them for free (e.g., Furr et al., 2001), it is important to implement prevention and treatment interventions that target these individuals with depression. Currently, screening for depression on college campuses has yielded mixed results in terms of effective treatment for depression (e.g., Chung et al., 2011; Farr, Dietz, Gibbs, Williams, & Tregear, 2011). Incorporating measures of interpersonal problems into screening efforts may provide a more extensive assessment of depressed individuals because these measures capture interpersonal problems, distress, and maladaptive behaviors that other measures do not (e.g., Soldz et al., 1995).

Limitations

The findings in this study must be interpreted in view of several limitations. Although the number of individuals with moderate to severe depression in this sample was sufficient for

LPA given the number of parameters we estimated, the sample was nonetheless not large. The cold subgroup identified by LPA had a particularly small number of participants compared to the other groups, limiting power to find group differences and decreasing our confidence in the generalizability of effects found for this group. In addition, participants were largely white (75.00%) and female (71.50%). Future studies should examine interpersonal heterogeneity in depression in larger and more diverse samples. It is also important to note that the findings in this study are based on self-report measures; research using other kinds of measures would be useful to extend the current results.

There are notable challenges in classifying individuals with depression into distinct groupings. One issue involves the tendency of empirical typologies to vary across samples based on sampling characteristics (Eaton, Krueger, South, Simms, & Clark, 2011). In interpersonal typologies, this tendency leads to a certain arbitrariness in the labeling of groups across studies that masks the more general finding of heterogeneity across the entire IPC. Isolating and labeling interpersonal groups has the advantage of readily depicting individual differences and comparing groups on outcome variables. However it would be misleading to think that interpersonal groups reflect natural clusters or types rather than a shorthand for interpersonal heterogeneity more generally. Figure 1 makes this clear – the overall pattern is a cloud about the center of the circle, not distinct groups with zones of rarity between them (see Kendell & Jablensky, 2003). Thus, while it is convenient and efficient to talk about people as cold, dominant, warm, or submissive, it should be kept in mind that these groups are relative and coarse approximations of the more fine grained distinctions that can be observed individually.

Conclusion

The purpose of this study was to examine interpersonal problem heterogeneity in depressed young adults. Our results are generally consistent with Cain et al.'s (2012) findings of interpersonal heterogeneity in individuals with depression that has important clinical and research implications. We demonstrated that the differences in interpersonal functioning are present among a sample of depressed young adults using a measure of interpersonal problems rather than styles. These differences were related to risks for certain forms of personality problems and alcohol abuse. These findings strongly support the importance of interpersonal heterogeneity in psychopathology and suggest that incorporating interpersonal measures with clinical practice and research involving depression would be advantageous. In the future, such research can form an empirical basis for individualized prevention and intervention efforts to target the interpersonal expressions of depression.

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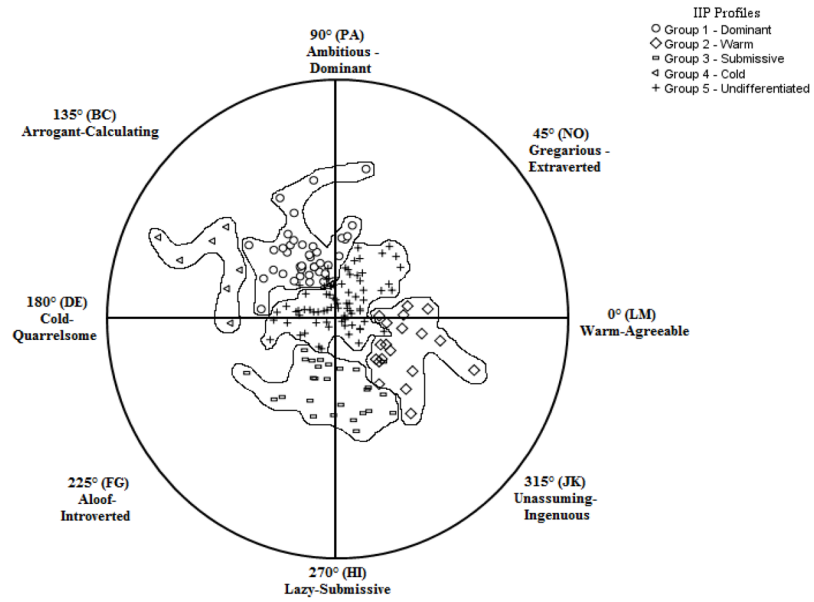


Figure 1. IIP-SC Placements of All Individuals Organized by Group
 Note: This figure shows every individual in the sample represented on the IIP-SC and denoted by the group they were placed in.

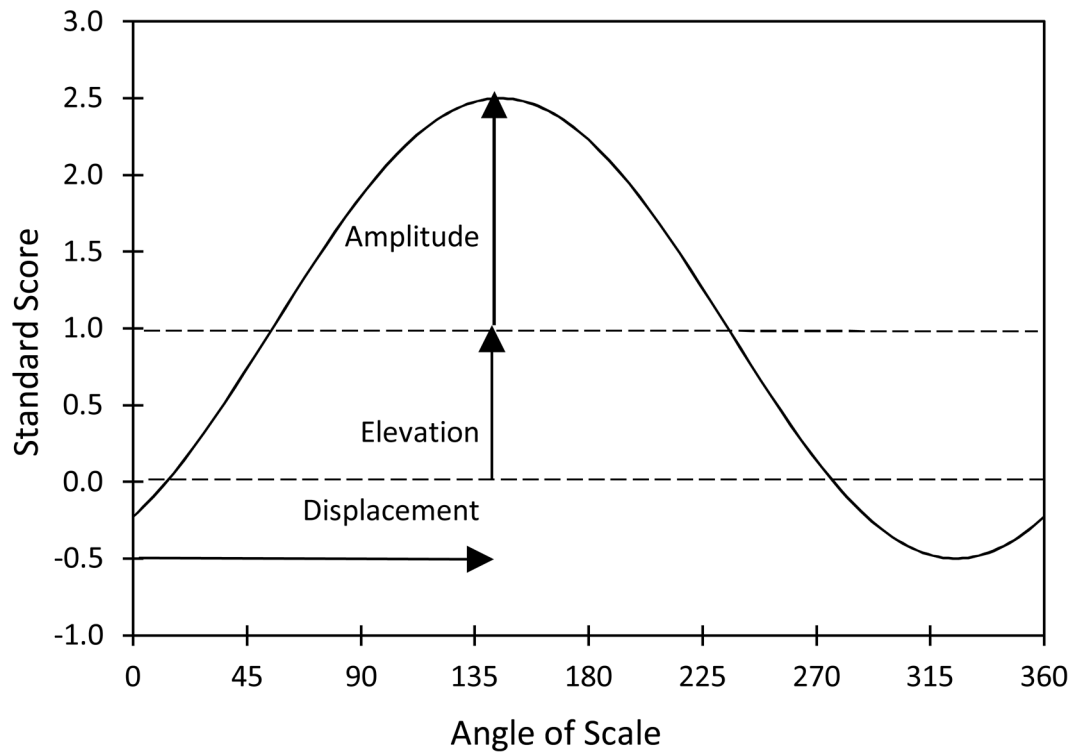


Figure 2. Circumplex Structural Summary Example

Note. X axis = circumplex angle in degrees; Y axis = standard (z) score on IIP-SC octant. In this example, elevation = 1.0, amplitude = 1.5, and displacement = 140°.

Table 1

Latent Profile Analysis Model Fit Indices and Entropy Statistic

Profile Solution	AIC _c	BIC	Entropy
One-profile	3539.90	3586.75	--
Two-profile	3269.45	3339.23	.84
Three-profile	3163.84	3253.48	.87
Four-profile	3138.03	3243.81	.86
Five-profile	3116.31	3233.67	.86
Six-profile	3115.29	3238.52	.86
Seven-profile	3118.84	3240.75	.88

Note: Dashes indicate that no entropy is calculated for a one-profile solution because classification is certain. Bold type indicates preferred model.

Table 2

Structural Summary Parameters and Circular Statistics for Interpersonal Profiles

Group	N	R ²	Elevation	Amplitude	Displacement	Displacement Variance	95% Confidence Interval
Whole Sample	172	0.77	1.65	0.17	107.56°	71.02	118.77° – 96.34°
Group 1 (Dominant)	42	0.91	1.92	1.00	115.91°	19.57°	110.10° – 121.83°
Group 2 (Warm)	19	0.90	1.72	1.06	337.36°	20.04°	328.35° – 346.37°
Group 3 (Submissive)	27	0.86	1.91	0.97	265.64°	26.66°	255.58° – 275.70°
Group 4 (Cold)	7	0.92	1.73	1.97	158.24°	12.20°	149.21° – 167.28°
Group 5 (Undifferentiated)	77	0.78	1.39	0.24	80.15°	66.18°	65.37° – 94.93°

Table 3
IIP-SC Group Means (and Standard Deviations) for FFMRF, PID-5, and AUDIT Scales

FFMRF Scales	Group 1 Dominant N = 42	Group 2 Warm N = 19	Group 3 Submissive N = 27	Group 4 Cold N = 7	Group 5 Undifferentiated N = 77	ANOVA F	Eta ²
Neuroticism	18.77 (3.96)	20.37 (3.96)	19.42 (3.86)	19.67 (3.16)	18.62 (3.53)	1.02	.03
Extraversion	18.20 ^{b,c} (3.16)	18.84 ^c (3.76)	15.36 ^a (3.13)	15.86 ^{a,b} (3.13)	19.41 ^c (4.25)	6.22*	.14
Openness	18.92 (2.87)	21.11 (3.69)	21.42 (3.94)	21.17 (7.03)	20.22 (3.66)	2.31	.06
Agreeableness	18.87 ^b (3.08)	23.44 ^d (3.40)	22.85 ^c (2.63)	14.14 ^a (5.15)	21.17 ^c (3.07)	17.75*	.31
Conscientiousness	18.87 (4.17)	20.11 (5.10)	19.84 (3.59)	21.33 (6.15)	19.35 (3.70)	.71	.02
PID-5 Scales							
<i>Negative Affectivity</i>	1.49 (.31)	1.60 (.38)	1.48 (.28)	1.49 (.49)	1.40 (.32)	1.72	.04
Submissiveness	1.32 ^b (.59)	2.13 ^c (.60)	1.87 ^c (.45)	.89 ^a (.24)	1.43 ^b (.64)	11.07*	.21
Restricted Affectivity	1.16 ^{a,b} (.54)	.71 ^a (.57)	1.14 ^{a,b} (.60)	1.51 ^b (.99)	1.03 ^a (.66)	2.70*	.06
Separation Insecurity	1.47 ^{a,b} (.55)	1.80 ^b (.80)	1.27 ^a (.60)	1.45 ^{a,b} (1.08)	1.39 ^{a,b} (.62)	2.08*	.05
Anxiousness	1.82 ^a (.54)	2.26 ^b (.57)	2.07 ^{a,b} (.67)	1.84 ^a (1.00)	1.78 ^a (.58)	3.16*	.07
Emotional Lability	1.56 (.60)	1.76 (.84)	1.64 (.72)	1.63 (1.14)	1.56 (.61)	.39	.01
Hostility	1.62 ^c (.48)	1.02 ^{a,b} (.57)	.91 ^a (.46)	1.71 ^c (.49)	1.25 ^b (.49)	11.58*	.22
Perseveration	1.46 (.51)	1.54 (.57)	1.49 (.44)	1.37 (.69)	1.35 (.53)	.77	.02
<i>Detachment</i>	1.24 ^{a,b} (.33)	1.03 ^a (.41)	1.34 ^b (.50)	1.41 ^b (.51)	1.06 ^a (.38)	4.35*	.09
Suspiciousness	1.45 (.38)	1.28 (.55)	1.22 (.62)	1.57 (.62)	1.26 (.46)	1.91	.04
Depressivity	1.20 (.49)	1.22 (.69)	1.40 (.78)	1.22 (.87)	1.08 (.56)	1.47	.03
Withdrawal	1.17 ^b (.51)	.68 ^a (.47)	1.59 ^c (.59)	1.74 ^c (.48)	1.00 ^{a,b} (.52)	12.52*	.23
Intimacy Avoidance	1.12 (.60)	.73 (.70)	.86 (.62)	.88 (.52)	.72 (.07)	2.90*	.07
Anhedonia	1.26 (.07)	1.25 (.17)	1.64 (.14)	1.63 (.35)	1.23 (.07)	2.80*	.06
<i>Antagonism</i>	1.29 ^c (.32)	.85 ^{a,b} (.31)	.60 ^a (.38)	1.60 ^d (.60)	1.03 ^{b,c} (.46)	16.17*	.28
Manipulativeness	1.39 ^b (.45)	.96 ^{a,b} (.65)	.73 ^a (.65)	2.09 ^c (.99)	1.24 ^b (.71)	8.28*	.17
Deceitfulness	1.42 ^c (.39)	.92 ^{a,b} (.62)	.73 ^a (.60)	1.79 ^d (.76)	1.17 ^{b,c} (.60)	9.21*	.18
Callousness	1.10 ^c (.48)	.24 ^a (.22)	.31 ^a (.28)	1.60 ^d (.68)	.57 ^b (.42)	31.77*	.43

FFMRF Scales	Group 1 Dominant	Group 2 Warm	Group 3 Submissive	Group 4 Cold	Group 5 Undifferentiated	ANOVA <i>F</i>	η^2
	N = 42	N = 19	N = 27	N = 7	N = 77		
Attention Seeking	1.47 ^b (.54)	1.39 ^b (.64)	.81 ^a (.62)	1.29 ^b (.65)	1.36 ^b (.67)	5.09*	.11
Grandiosity	1.10 ^{b,c} (.52)	.70 ^b (.49)	.45 ^a (.49)	1.24 ^c (.69)	.82 ^{ab} (.59)	6.86*	.14
Disinhibition	1.39 ^b (.29)	1.28 ^{ab} (.47)	1.09 ^a (.28)	1.22 ^{ab} (.48)	1.25 ^{ab} (.33)	3.35*	.07
Inresponsibility	1.16 ^c (.47)	.63 ^a (.13)	.71 ^a (.09)	.86 ^{ab} (.26)	.78 ^a (.06)	5.28*	.11
Impulsivity	1.41 ^b (.62)	1.12 ^{ab} (.85)	.81 ^a (.58)	1.05 ^{ab} (.66)	1.17 ^{ab} (.66)	3.43*	.08
Distractibility	1.47 (.50)	1.83 (.78)	1.74 (.59)	1.43 (.59)	1.56 (.58)	1.79	.04
Rigid Perfectionism	1.45 (.57)	1.44 (.72)	1.29 (.71)	1.47 (.77)	1.29 (.58)	.69	.02
Risk Taking	1.48 ^b (.43)	1.38 ^b (.66)	.93 ^a (.38)	1.32 ^b (.39)	1.44 ^b (.55)	5.94*	.13
Psychoticism	1.26 (.48)	1.04 (.66)	1.12 (.57)	1.22 (.75)	1.09 (.49)	.93	.22
Eccentricity	1.43 (.55)	1.42 (1.00)	1.61 (.73)	1.93 (.96)	1.43 (.72)	1.05	.03
Perceptual Dysregulation	1.19 (.52)	1.02 (.57)	.96 (.53)	.89 (.60)	.98 (.52)	1.33	.03
Unusual Beliefs	1.16 ^b (.63)	.69 ^a (.67)	.79 ^{ab} (.67)	.82 ^{ab} (.83)	.85 ^{ab} (.53)	2.91*	.07
AUDIT Scale							
Alcohol Problems	20.62 ^a (6.08)	18.95 ^b (4.90)	16.23 ^c (4.79)	19.29 ^b (7.30)	17.80 ^b (5.02)	2.99*	.07

Note: Domain names listed in bold italics. Mean differences across groups were based on post-hoc Duncan analyses. Significant differences according to Duncan's post-hoc test are indicated by superscripts.

* $p < .05$