Wesleyan University

April, 2015

Personality disorder risk factors for suicide attempts over 10 years of follow-up

Emily B. Ansell
Aidan G. C. Wright, *University of Pittsburgh - Main Campus*
John C. Markowitz
Charles A. Sanislow, *Wesleyan University*
Christopher J. Hopwood, *Michigan State University*, et al.

BRIEF REPORT

Personality Disorder Risk Factors for Suicide Attempts Over 10 Years of Follow-Up

Emily B. Ansell
Yale University School of Medicine

Aidan G. C. Wright
University of Pittsburgh

John C. Markowitz
Columbia University College of Physicians and Surgeons and
New York State Psychiatric Institute

Charles A. Sanislow
Wesleyan University

Christopher J. Hopwood
Michigan State University

Mary C. Zanarini
Harvard Medical School and McLean Hospital

Shirley Yen
Brown University

Anthony Pinto
Columbia University College of Physicians and Surgeons and
New York State Psychiatric Institute

Thomas H. McGlashan and Carlos M. Grilo
Yale University School of Medicine

Identifying personality disorder (PD) risk factors for suicide attempts is an important consideration for research and clinical care alike. However, most prior research has focused on single PDs or categorical PD diagnoses without considering unique influences of different PDs or of severity (sum) of PD criteria on the risk for suicide-related outcomes. This has usually been done with cross-sectional or retrospective assessment methods. Rarely are dimensional models of PDs examined in longitudinal, naturalistic prospective designs. In addition, it is important to consider divergent risk factors in predicting the risk of ever making a suicide attempt versus the risk of making an increasing number of attempts within the same model. This study examined 431 participants who were followed for 10 years in the Collaborative Longitudinal Personality Disorders Study. Baseline assessments of personality disorder criteria were summed as dimensional counts of personality pathology and examined as predictors of suicide attempts reported at annual interviews throughout the 10-year follow-up period. We used univariate and multivariate zero-inflated Poisson regression models to simultaneously evaluate PD risk factors for ever attempting suicide and for increasing numbers of attempts among attempters. Consistent with prior research, borderline PD was uniquely associated with ever attempting. However, only narcissistic PD was uniquely associated with an increasing number of attempts. These findings highlight the relevance of both borderline and narcissistic personality pathology as unique contributors to suicide-related outcomes.

Keywords: suicide attempt, personality disorder, borderline, narcissistic, risk factors

Identification of diagnostic and personality characteristics that put individuals at increased risk for suicide-related outcomes is a target for clinicians and researchers alike. Personality disorders (PDs) are frequently diagnosed in patients presenting with suicide risk (Overholser, Stockmeier, Dilley, & Freiheit, 2002), suggesting that personality pathology may reflect important individual differences in predicting suicide attempts. Yet research and risk-assessment recommendations often disagree markedly on the extent to which different PDs present risk factors for suicide. Some of this controversy derives from methodological differences, in which (a) assessment is limited to one, or a subgroup, of possible PD diagnoses; (b) assessment relies on retrospective or cross-sectional assessments; or (c) there are inconsistencies in quantitative analytic approaches. These discrepancies have made it difficult to draw firm conclusions about the associations of a given PD with suicide risk. In fact, the confusion and inconsistency mean that clinicians may ignore some diagnoses in assessing suicide risk (Chioqueta & Stiles, 2004). Beyond this, a suicide attempt frequently provides the impetus for connecting an individual with clinical services, especially hospitalization. Understanding which PDs may raise the risk for increasing numbers of suicide attempts is an important avenue for suicide research that has implications for treatment planning and future risk assessment. Yet little research has examined which PD dimensions predict an increasing number of suicide attempts while controlling for the propensity for an initial attempt.

Research on suicide attempts and PDs has focused primarily on either borderline personality disorder (BPD) or Cluster B PDs (antisocial, borderline, histrionic, and narcissistic). National Epidemiologic Survey on Alcohol and Related Conditions data identified BPD as a top population-attributable risk factor for suicide attempts (Bolton & Robinson, 2010). To address the distinction between ever and recurrent attempts, Stringer et al. (2013) used a negative binomial regression model to examine the effects of BPD on ever and recurrent attempts in depressed and anxious patients. BPD traits did predict ever and recurrent suicide attempts; however, other PD traits were not assessed or included in the model. Analyses that did include other PDs, particularly Cluster B PDs, may point to additional or unique associations between personality pathology and suicide-related outcomes.

Cluster B PDs have been found to account for the bulk of suicide risk among individuals with significant personality pathology. In an examination of endophenotypes of personality and suicide risk (McGirr et al., 2009), researchers found that Cluster B PD traits mediated the link between familial predisposition to suicide attempts and severity in family members. The researchers interpreted these findings as supporting the link between an impulsive aggression intermediate phenotype and suicide (McGirr et al., 2009). Impulsive aggression, the tendency to engage in interpersonal aggressive or hostile behavior (Bornovalova, Lejuez, Daughters, Rosnethal, & Lynch, 2005; Denson, Pedersen, Friese, Hahm, & Roberts, 2011), particularly fits the issues with aggressive behavior associated with antisocial PD (ASPD). ASPD has been associated with suicide attempts (Links, Gould, & Ratnayake, 2003), particularly in female criminal offenders (Douglas et al., 2008; Kimonis et al., 2010). ASPD has also been identified as a risk factor for premature termination of dialectical behavior therapy, a treatment focused on reducing self-harming behaviors (Kröger, Röepke, & Kliem, 2014). Thus, individuals with ASPD

diagnoses may be at an increased risk for multiple suicide attempts over the course of their lifetimes.

The hostile and explosive relation pattern of impulsive aggression also fits with the problematic interpersonal patterns characteristic of narcissistic PD (NPD; Horton & Sedikides, 2009; Ogrodniczuk, Piper, Joyce, Steinberg, & Duggal, 2009; Roche, Pincus, Conroy, Hyde, & Ram, 2013). Supporting this idea, Pincus et al. (2009) found maladaptive narcissistic personality traits associated with suicide attempts in a small clinical sample. Similarly, a geriatric study reported greater endorsement of suicidal ideation among patients with NPD (Heisel, Links, Conn, van Reekum, & Flett, 2007). However, other research suggests associations of NPD with less impulsive but more lethal attempts (Blasco-Fontecilla et al., 2009). Importantly, only a few studies have examined all PDs in multivariate models. Thus, it is not clear to what extent individual Cluster B PDs may contribute to predicting suicide-attempt risk beyond the variability associated with BPD criteria.

This issue is particularly salient when examining the existing PD and suicide research. Although some studies have reported risks associated with Cluster C PDs (dependent, avoidant, and obsessive–compulsive; Dervic, Grunebaum, Burke, Mann, & Oquendo, 2007; Diaconu & Turecki, 2009), most research has failed to consider the extensive comorbidity of PD diagnoses (Becker, Grilo, Edell, & McGlashan, 2000) in examining suicide risk and/or to consider the dimensionality or severity of PD criteria in predicting suicide risk. As an example, if a patient with a suicide attempt were to meet four diagnostic criteria for obsessive–compulsive PD ([OCPD] threshold) but also meet four BPD criteria (subthreshold), in a categorical analysis, the predictive variance may be attributed to OCPD. However, in a multivariate dimensional analysis, both sets of criteria may be considered simultaneously as predictive of suicide attempts. This type of analysis helps to clarify the weight that subthreshold criteria may hold in predicting suicide risk. Therefore, it is important to understand the association of severity on a given PD dimension with suicide attempts relative to other PD dimensions, particularly risk already captured by BPD, in considering assessment and risk profiles.

This study used data from the Collaborative Longitudinal Personality Disorders Study (CLPS) to examine dimensional PD predictors of ever and multiple suicide attempts using zero-inflated count regression models, which can distinguish between predictors of ever attempting and multiple attempts. Prior publications from the CLPS regarding suicide attempts have looked at PD diagnoses and BPD criteria as risk factors for any suicide attempt over 2 years of follow-up (Yen et al., 2003, 2004) and differences in traits and psychiatric disorders between single and multiple attempters (Boisseau et al., 2013). However, no studies have examined dimensional symptom counts of the 10 *Diagnostic and Statistical Manual of Mental Disorders* (4th ed. [*DSM–IV*]; American Psychiatric Association, 1994) PDs to prospectively predict suicide attempts over 10 years, and no study has used a zero-inflated count regression to distinguish risk factors for any attempt from those that might predict increasing numbers of multiple attempts.

On the basis of prior research findings, we hypothesized that Cluster B PDs would be associated in univariate models with ever making an attempt (one or more). We also hypothesized, given the focus in the literature on BPD and self-harm, that BPD would

increment all other PDs in a multivariate model predicting ever making an attempt. Given the dearth of research, particularly using this statistical approach, we had a limited basis on which to make an a priori hypothesis predicting an increasing number of suicide attempts. However, given theoretical understanding that ongoing self-harm is fundamental to the BPD construct and prior research that has predominantly focused on BPD as the primary personality pathology associated with suicide-related outcomes, it seemed reasonable that BPD symptoms (without the self-harm criterion) would be associated with making an increasing number of suicide attempts in univariate and multivariate models. In addition, on the basis of the associations with impulsive aggression, it was hypothesized that the other Cluster B PDs, specifically NPD and ASPD, would be predictive in univariate models of increasing numbers of suicide attempts.

Method

Participants and Procedures

The current study included the 431 participants who completed all 10 years of the CLPS, a multisite, prospective, naturalistic study designed to assess the course and outcome of patients with PDs and a comparison group of patients with current major depressive disorder (MDD) but no PD. The CLPS enrolled 668 participants ages 18–45 years with at least one of four index PDs (schizotypal PD, BPD, avoidant PD, and OCPD) or with current MDD without any PD. Details of the CLPS methods and participants, including specific co-occurrence patterns among diagnoses, have been reported (McGlashan et al., 2000). On average, participants met 2.1 PD diagnoses at baseline, a rate comparable with other clinical studies that were not selected for index PDs (Becker et al., 2000), increasing confidence in the generalizability of this sample to other clinical samples. The mean age of the participants at entry into the study was 33.0 years (SD = 8.1). Demographic frequencies are reported in Table 1.

All participants provided written informed consent following a full description of study procedures. Each collaborating site's institutional review board approved the study protocol. Interviewers were experienced research–clinicians with master's and/or doctoral degrees in mental health disciplines who underwent standardized training to achieve reliability in diagnostic measures and were supervised by investigators within and across sites to maintain reliability and prevent temporal drift.

At baseline, interviewers administered the Diagnostic Interview for *DSM–IV* Personality Disorders (DIPD-IV; Zanarini, Frankenburg, Sickel, & Yong, 1996), a semistructured interview for all *DSM–IV* PDs. In the CLPS, interrater and test–retest reliability of the DIPD-IV for the PDs was good to excellent (Zanarini et al., 2000). For this analysis, dimensional scores were computed for each PD by summing the 0, 1, and 2 for each PD criterion into a total symptom count. BPD was computed and run with the suicide-related criterion both included and excluded from the summed score. Suicide attempts were assessed using the Longitudinal Interval Follow-up Evaluation (LIFE; Keller et al., 1987). The LIFE is a semistructured interview rating system for assessing the longitudinal course of mental disorders, functioning, and suicidal behavior. The number of suicide attempts and gestures are recorded on a monthly basis. Evaluators make detailed ratings of

Table 1

Demographics of Sample

Variable	%	Frequency
Female	65.2	281
Ethnicity		
Caucasian	76.6	330
African American	12.1	52
Hispanic	8.6	37
Asian	1.9	8
Other	0.8	4
Axis I disorder		
MDD	76.8	331
Bipolar II disorder	3.7	16
Substance abuse/dependence	35.3	152
Alcohol abuse/dependence	37.6	162
Posttraumatic stress disorder	29.5	127
Panic disorder	25.8	111
Social anxiety disorder	25.8	111
Generalized anxiety disorder	23.0	99
Obsessive–compulsive disorder	18.1	78
Eating disorder	27.8	120
Personality disorder (PD)[a]		
Paranoid	22.1	95
Schizoid	9.1	39
Schizotypal	20.2	87
Borderline	42.0	181
Histrionic	3.5	15
Narcissistic	10.0	43
Antisocial	9.7	42
Avoidant	54.5	235
Dependent	12.5	54
Obsessive–compulsive	46.6	201
MDD but no PD	14.4	62
Suicide attempts[b]		
Frequency	13.5	58
Range	0–11	

Note. N = 431. MMD = major depressive disorder.
[a] The numbers of participants exceeding, meeting, or having one criterion below threshold for the specified PD diagnosis are reported. Analysis was run using counts of criteria met for each PD. [b] Defined as having at least definite intent and mild medical lethality.

intent and medical threat. To distinguish these analyses definitively from nonsuicidal self-injury, which may have very different predictors, suicide attempt was coded as present if intent was assessed as at least *definite* and medical threat was assessed as at least *mild*. Participants were reinterviewed at 6 and 12 months and yearly thereafter for 10 years following baseline.

Analysis

Suicide attempts are rare events even among individuals in clinical populations, resulting in a distribution of suicide attempt counts with a high frequency of zeros followed by a sharp positive skew of attempt counts. This undermines assumptions underlying commonly used analytic techniques (e.g., linear regression/correlation) but also may be suggestive of distinct psychological processes associated with ever attempting suicide versus multiple attempts (Atkins & Gallop, 2007; Wright, Pincus, & Lenzenweger, 2012). Past analyses have primarily tried to deal with this pattern of data by focusing only on suicide attempters, grouping individuals by numbers of attempts (e.g., single, 2–4 attempts, 5–7 attempts, etc.), or comparing single with multiple attempters as

separate groups in search of distinguishing characteristics. Each of these approaches fails to adequately account for the observed distribution of rare events, leading to potential misestimation of risk associated with predictors. Further, these approaches do not separately evaluate whether distinct predictors account for who makes any attempt as opposed to those who make an increasing number of attempts beyond the first.

Past conflicting findings may be better understood by considering whether relatively underassessed PDs account for a different risk process in suicide outcomes (e.g., one PD predicts first attempt, whereas another PD predicts increasing attempts). Two-step count models (e.g., zero-inflated Poisson [ZIP] regression) offer an analytic framework for evaluating these data patterns (Atkins & Gallop, 2007; Wright et al., 2012). In ZIP regression, a class of individuals who will never attempt suicide is estimated from the excess of zeros (i.e., zero-inflation) beyond the number expectable from a standard Poisson distribution. This modeling approach then uses a mixture model to combine logistic and count regression to simultaneously identify predictors that distinguish subjects who will never attempt suicide from those who will and to identify risk factors for increasing numbers of suicide attempts among those within the attempter class (Cameron & Trivedi, 1998). In ZIP models, the predictors that are included and that achieve significance can vary across the steps of the model, allowing for identification of distinct processes. For example, certain diagnoses may be associated with ever attempting suicide, whereas other diagnoses may predict making multiple attempts beyond the first. As the data might suggest, different processes may be involved with each step, and, as a result, this would be important to explicitly model. Therefore, examining both multiple PD diagnoses and considering increasing numbers of suicide attempts using appropriate modeling techniques is a needed extension of the existing literature. Despite the obvious benefits of these models for suicide research, only one prior study has used them to examine risk factors for multiple self-harm events (Bethell, Rhodes, Bondy, Lou, & Guttmann, 2010), and none have examined these with suicide attempts or with PDs as predictors.

A series of ZIP models was estimated in Mplus 6.12 (Muthén & Muthén, 1998–2011). The Vuong (1989) likelihood ratio test was used to compare ZIP models against basic count models (e.g., Poisson) and other two-step count models (e.g., negative-binomial hurdle). In each case, the ZIP model fit significantly better on the basis of the Vuong statistics, thereby supporting the use of this specific distribution for the models reported here. Initially, univariate models were estimated predicting the number of suicide attempts from individual PD symptom counts, with the same PD entered as predictor of the logistic step (i.e., attempter vs. nonattempter) and the count step (i.e., number of attempts if in the attempter class). Second, a multivariate model was estimated with all PDs entered simultaneously as predictors. All models included sex as a covariate because gender differences have previously been associated with suicide risk and with prevalence of PD diagnoses. Coefficients were exponentiated to the respective effect sizes associated with logistic (odds ratio) and count (rate ratio) regression.

Results

Coefficients, significance tests, and model fit for each model are summarized in Table 2. In univariate models, paranoid, antisocial,

Table 2
Summary of Model Coefficients and Fit

Personality disorder	Logistic step (attempter)		Poisson step (number of attempts)	
	OR	p	RR	p
Univariate models				
Paranoid	**1.12**	**.043**	0.95	.339
Schizoid	1.03	.666	1.06	.445
Schizotypal	1.07	.142	1.05	.324
Antisocial	**1.11**	**.007**	0.99	.574
Borderline	**1.52**	**.000**	1.02	.762
Histrionic	**1.13**	**.037**	1.03	.486
Narcissistic	0.97	.497	**1.15**	**.000**
Avoidant	1.08	.061	0.97	.631
Dependent	**1.15**	**.023**	0.98	.753
Obsessive	0.99	.842	0.95	.291
Multivariate model				
Paranoid	0.83	.088	1.00	.990
Schizoid	0.91	.490	1.08	.354
Schizotypal	1.08	.316	1.00	.961
Antisocial	1.12	.057	0.95	.079
Borderline	**1.77**	**.000**	0.97	.784
Histrionic	1.03	.855	0.97	.696
Narcissistic	0.83	.081	**1.18**	**.000**
Avoidant	1.03	.567	0.98	.673
Dependent	0.90	.251	1.10	.181
Obsessive	1.05	.510	0.91	.093

Note. $N = 431$. All model coefficients were estimated controlling for gender. The signs of coefficients for the logistic step were reversed before exponentiating them, because Mplus 6.12 predicts the zero class (i.e., never attempter) as opposed to the nonzero class. As reported, the logistic and count coefficients can be interpreted as predicting in the same direction (i.e., toward any or more attempts, respectively). Values in bold indicate $p < .05$. OR = odds ratio; RR = rate ratio.

borderline, histrionic, and dependent PD symptoms predicted ever making a suicide attempt. Only NPD symptoms predicted the number of suicide attempts beyond the initial attempt over the course of the 10 years of the study. In the multivariate model, only BPD remained a significant predictor of any attempt in the presence of all PDs, whereas NPD remained the sole significant predictor of multiple attempts. These findings persisted when the BPD score without the self-harm criterion was entered in the model.

Discussion

The present findings demonstrate the unique effects of the severity of both BPD and NPD in predicting suicide attempts over 10 years using a prospective, naturalistic longitudinal method. Our study is the first to examine PDs prospectively as risk factors for suicide attempts using ZIP models, and it demonstrates the utility of these models for assessing PD risk factors for multiple suicide attempts in a prospective longitudinal study. These findings also demonstrate the differences in associations between dimensions of personality pathology and suicide attempts when comparing univariate models to a multivariate model.

When evaluated independently, several PD dimensions emerged as risk factors for ever attempting: paranoid, antisocial, borderline, histrionic, and dependent PDs. The multivariate model, however,

found that BPD severity uniquely predicted ever attempting suicide over other PD severity. This replicates prior findings that BPD is a significant risk factor for ever making a suicide attempt (Bolton & Robinson, 2010) and likely reflects common variance underlying multiple PDs that is most strongly associated with BPD (e.g., emotional dysregulation or impulsive aggression endophenotypes; Bornovalova et al., 2005; McGirr et al., 2009).

Research exploring risk factors associated with suicide attempts in BPD has found a multitude of complex and interrelated factors, including depression, substance use, trauma, and affective instability (Wedig et al., 2012). Prior research from the CLPS identified negative affect as the most robust trait predictor of suicide attempts (Yen et al., 2009). Because many of these risk factors occur across PDs, further research is needed to determine which factors underlie the common variance among these PDs that is associated with ever making an attempt. Understanding this may highlight novel assessment methods for suicide attempts or target mechanisms underlying the risk for attempting suicide.

Contrary to our predictions, BPD did not predict an increasing number of attempts. The ZIP models found NPD to be the sole predictor of an increasing number of suicide attempts in either univariate or multivariate models. This effect held when the other PDs, including other Cluster B PDs, were entered in the model, indicating that the risk is uniquely associated with NPD severity. Given these findings, it is important that suicide assessment recommendations and clinical practice include assessment and consideration of pathological narcissism when evaluating suicide risk, particularly in the context of a history of attempts.

Other research suggests associations of NPD with less impulsive but more lethal attempts (Blasco-Fontecilla et al., 2009) and that suicide attempts in narcissists are preceded by work-related life events (Blasco-Fontecilla et al., 2010). Overall, there has been limited research examining what *unique* mechanisms underlying narcissistic pathology are associated with increased risk for suicide outcomes. Narcissistic pathology is often associated with emotional dysregulation that accompanies failures to meet entitled expectations that may result in interpersonally aggressive or hostile behaviors (Ogrodniczuk et al., 2009). In addition, deficits in emotional empathy distinguish NPD from BPD (Ritter et al., 2011) and may reflect social cognition deficits that further contribute to problematic relating with others. Further research should determine whether it is the emotional dysregulation, impulsivity, and/or problematic social cognition or interpersonal patterns that explain the risk for multiple attempts in NPD found in the present study and how it is distinct from the BPD risk for ever making an attempt.

Shame proneness has an established association with suicidality and self-harm (Bryan, Morrow, Etienne, & Ray-Sannerud, 2103; Schoenleber, Berenbaum, & Motl, 2014; Wiklander et al., 2012). Shame is also hypothesized as a mediating link between pathological narcissism and suicide-related outcomes (Links, 2013; Ronningstam & Maltsberger, 1998). However, self-conscious emotions may underlie a range of personality pathology. A longitudinal study of BPD found significant associations between BPD and shame over 16 years, particularly associations with childhood trauma (Karan, Niesten, Frankenburg, Fitzmaurice, & Zanarini, 2014). A comparison among BPD, NPD, and control patients found that NPD patients did not have as high explicit shame as BPD patients, although they did report higher levels of implicit

shame than controls or BPD patients (Ritter et al., 2014). In addition, a study examining a neuroanatomical difference postmortem in suicide completers found evidence of disruption in the von Economo neurons that may relate to pathological levels of negative self-referential emotions such as shame (Brüne et al., 2011). Overall, these findings point to the possibility that shame proneness may play a role in the association between NPD and increasing numbers of suicide attempts.

The CLPS is one of few studies to prospectively follow personality-disordered individuals and annually assess their suicide attempts. As with any study, sampling techniques and inclusion criteria may limit the generalizability of findings. Participants had to meet criteria for one of four index PDs to enter the study; thus, our ability to detect effects for nonstudy PDs may be more limited. However, PD diagnoses frequently co-occur across patient groups (Becker et al., 2000). CLPS participants had, on average, between two and three PD diagnoses at baseline (McGlashan et al., 2000). However, the potential exclusion of subjects with primary diagnoses of other PDs may limit the generalizability of these findings to other settings or samples. Most participants were outpatients, and findings might differ in forensic, inpatient, or nontreatment-seeking populations. Conversely, suicide attempt risk assessment matters most with outpatients, who receive less intense daily monitoring yet exhibit substantial symptoms or impairment warranting treatment.

The study findings convey the importance and utility of using two-step count models when examining rarely occurring psychological phenomena such as suicide attempts. The current findings support prior research identifying borderline personality pathology as a risk for ever attempting suicide. These findings also highlight the relevance of narcissistic pathology as a unique component of personality pathology relevant for evaluating clinical risk for multiple suicide attempts. Notably, although treatment research for self-harm and BPD has expanded over the last decade, there is a dearth of empirically supported treatments and treatment research on NPD. It may be that current treatment approaches widely used for suicidal behaviors are less effective for NPD patients, resulting in less engagement in treatment systems that may mitigate subsequent attempts. Future research on suicide risk factors should incorporate assessment of all PDs, particularly BPD and NPD, and consider using these models to examine factors and processes that contribute to ever making an attempt versus risk for increasing numbers of attempts.

References

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Atkins, D. C., & Gallop, R. J. (2007). Rethinking how family researchers model infrequent outcomes: A tutorial on count regression and zero-inflated models. *Journal of Family Psychology, 21,* 726–735. http://dx.doi.org/10.1037/0893-3200.21.4.726

Becker, D. F., Grilo, C. M., Edell, W. S., & McGlashan, T. H. (2000). Comorbidity of borderline personality disorder with other personality disorders in hospitalized adolescents and adults. *American Journal of Psychiatry, 157,* 2011–2016. http://dx.doi.org/10.1176/appi.ajp.157.12.2011

Bethell, J., Rhodes, A. E., Bondy, S. J., Lou, W. Y. W., & Guttmann, A. (2010). Repeat self-harm: Application of hurdle models. *British Journal*

of Psychiatry, 196, 243–244. http://dx.doi.org/10.1192/bjp.bp.109 .068809

Blasco-Fontecilla, H., Baca-Garcia, E., Dervic, K., Perez-Rodriguez, M. M., Lopez-Castroman, J., Saiz-Ruiz, J., & Oquendo, M. A. (2009). Specific features of suicidal behavior in patients with narcissistic personality disorder. *Journal of Clinical Psychiatry, 70,* 1583–1587. http://dx.doi.org/10.4088/JCP.08m04899

Blasco-Fontecilla, H., Baca-Garcia, E., Duberstein, P., Perez-Rodriguez, M. M., Dervic, K., Saiz-Ruiz, J., . . . Oquendo, M. A. (2010). An exploratory study of the relationship between diverse life events and specific personality disorders in a sample of suicide attempters. *Journal of Personality Disorders, 24,* 773–784. http://dx.doi.org/10.1521/pedi .2010.24.6.773

Boisseau, C. L., Yen, S., Markowitz, J. C., Grilo, C. M., Sanislow, C. A., Shea, M. T., . . . McGlashan, T. H. (2013). Individuals with single versus multiple suicide attempts over 10 years of prospective follow-up. *Comprehensive Psychiatry, 54,* 238–242. http://dx.doi.org/10.1016/j .comppsych.2012.07.062

Bolton, J. M., & Robinson, J. (2010). Population-attributable fractions of Axis I and Axis II mental disorders for suicide attempts: Findings from a representative sample of the adult, noninstitutionalized US population. *American Journal of Public Health, 100,* 2473–2480. http://dx.doi.org/ 10.2105/AJPH.2010.192252

Bornovalova, M. A., Lejuez, C. W., Daughters, S. B., Rosenthal, M. Z., & Lynch, T. R. (2005). Impulsivity as a common process across borderline personality and substance use disorders. *Clinical Psychology Review, 25,* 790–812. http://dx.doi.org/10.1016/j.cpr.2005.05.005

Brüne, M., Schöbel, A., Karau, R., Faustmann, P. M., Dermietzel, R., Juckel, G., & Petrasch-Parwez, E. (2011). Neuroanatomical correlates of suicide in psychosis: The possible role of von Economo neurons. *PLoS One, 6*(6), e20936. http://dx.doi.org/10.1371/journal.pone.0020936

Bryan, C. J., Morrow, C. E., Etienne, N., & Ray-Sannerud, B. (2013). Guilt, shame, and suicidal ideation in a military outpatient clinical sample. *Depression and Anxiety, 30,* 55–60. http://dx.doi.org/10.1002/ da.22002

Cameron, A. C., & Trivedi, P. K. (1998). *Regression analysis of count data.* New York: Cambridge University Press. http://dx.doi.org/10.1017/ CBO9780511814365

Chioqueta, A. P., & Stiles, T. C. (2004). Assessing suicide risk in Cluster C personality disorders. *Crisis, 25,* 128–133. http://dx.doi.org/10.1027/ 0227-5910.25.3.128

Denson, T. F., Pedersen, W. C., Friese, M., Hahm, A., & Roberts, L. (2011). Understanding impulsive aggression: Angry rumination and reduced self-control capacity are mechanisms underlying the provocation–aggression relationship. *Personality and Social Psychology Bulletin, 37,* 850–862. http://dx.doi.org/10.1177/0146167211401420

Dervic, K., Grunebaum, M. F., Burke, A. K., Mann, J. J., & Oquendo, M. A. (2007). Cluster C personality disorders in major depressive episodes: The relationship between hostility and suicidal behavior. *Archives of Suicide Research, 11,* 83–90. http://dx.doi.org/10.1080/ 13811110600992928

Diaconu, G., & Turecki, G. (2009). Obsessive–compulsive personality disorder and suicidal behavior: Evidence for a positive association in a sample of depressed patients. *Journal of Clinical Psychiatry, 70,* 1551–1556. http://dx.doi.org/10.4088/JCP.08m04636

Douglas, K. S., Lilienfeld, S. O., Skeem, J. L., Poythress, N. G., Edens, J. F., & Patrick, C. J. (2008). Relation of antisocial and psychopathic traits to suicide-related behavior among offenders. *Law and Human Behavior, 32,* 511–525. http://dx.doi.org/10.1007/s10979-007-9122-8

Heisel, M. J., Links, P. S., Conn, D., van Reekum, R., & Flett, G. L. (2007). Narcissistic personality and vulnerability to late-life suicidality. *American Journal of Geriatric Psychiatry, 15,* 734–741. http://dx.doi.org/ 10.1097/01.JGP.0000260853.63533.7d

Horton, R. S., & Sedikides, C. (2009). Narcissistic responding to ego threat: When the status of the evaluator matters. *Journal of Personality, 77,* 1493–1526. http://dx.doi.org/10.1111/j.1467-6494.2009.00590.x

Karan, E., Niesten, I. J., Frankenburg, F. R., Fitzmaurice, G. M., & Zanarini, M. C. (2014). The 16-year course of shame and its risk factors in patients with borderline personality disorder. *Personality and Mental Health, 8,* 169–177. http://dx.doi.org/10.1002/pmh.1258

Keller, M. B., Lavori, P. W., Friedman, B., Nielsen, E., Endicott, J., McDonald-Scott, P., & Andreasen, N. C. (1987). The Longitudinal Interval Follow-up Evaluation: A comprehensive method for assessing outcome in prospective longitudinal studies. *Archives of General Psychiatry, 44,* 540–548. http://dx.doi.org/10.1001/archpsyc.1987 .01800180050009

Kimonis, E. R., Skeem, J. L., Edens, J. F., Douglas, K. S., Lilienfeld, S. O., & Poythress, N. G. (2010). Suicidal and criminal behavior among female offenders: The role of abuse and psychopathology. *Journal of Personality Disorders, 24,* 581–609. http://dx.doi.org/10.1521/pedi.2010.24.5 .581

Kröger, C., Röepke, S., & Kliem, S. (2014). Reasons for premature termination of dialectical behavior therapy for inpatients with borderline personality disorder. *Behaviour Research and Therapy, 60,* 46–52. http://dx.doi.org/10.1016/j.brat.2014.07.001

Links, P. S. (2013). Pathological narcissism and the risk of suicide. In J. S. Ogrodniczuk (Ed.), *Understanding and treating pathological narcissism* (pp. 167–181). Washington, DC: American Psychological Association. http://dx.doi.org/10.1037/14041-010

Links, P. S., Gould, B., & Ratnayake, R. (2003). Assessing suicidal youth with antisocial, borderline, or narcissistic personality disorder. *Canadian Journal of Psychiatry/La Revue canadienne de psychiatrie, 48,* 301–310.

McGirr, A., Alda, M., Séguin, M., Cabot, S., Lesage, A., & Turecki, G. (2009). Familial aggregation of suicide explained by Cluster B traits: A three-group family study of suicide controlling for major depressive disorder. *American Journal of Psychiatry, 166,* 1124–1134. http://dx.doi .org/10.1176/appi.ajp.2009.08111744

McGlashan, T. H., Grilo, C. M., Skodol, A. E., Gunderson, J. G., Shea, M. T., Morey, L. C., . . . Stout, R. L. (2000). The Collaborative Longitudinal Personality Disorders Study: Baseline Axis I/II and II/II diagnostic co-occurrence. *Acta Psychiatrica Scandinavica, 102,* 256–264. http://dx.doi.org/10.1034/j.1600-0447.2000.102004256.x

Muthén, L. K., & Muthén, B. O. (1998–2011). *Mplus user's guide* (6th ed.). Los Angeles: Author.

Ogrodniczuk, J. S., Piper, W. E., Joyce, A. S., Steinberg, P. I., & Duggal, S. (2009). Interpersonal problems associated with narcissism among psychiatric outpatients. *Journal of Psychiatric Research, 43,* 837–842. http://dx.doi.org/10.1016/j.jpsychires.2008.12.005

Overholser, J. C., Stockmeier, C., Dilley, G., & Freiheit, S. (2002). Personality disorders in suicide attempters and completers: Preliminary findings. *Archives of Suicide Research, 6,* 123–133. http://dx.doi.org/ 10.1080/13811110208951170

Pincus, A. L., Ansell, E. B., Pimentel, C. A., Cain, N. M., Wright, A. G. C., & Levy, K. N. (2009). Initial construction and validation of the Pathological Narcissism Inventory. *Psychological Assessment, 21,* 365–379. http://dx.doi.org/10.1037/a0016530

Ritter, K., Dziobek, I., Preißler, S., Rüter, A., Vater, A., Fydrich, T., . . . Roepke, S. (2011). Lack of empathy in patients with narcissistic personality disorder. *Psychiatry Research, 187,* 241–247. http://dx.doi.org/ 10.1016/j.psychres.2010.09.013

Ritter, K., Vater, A., Rüsch, N., Schröder-Abé, M., Schütz, A., Fydrich, T., . . . Roepke, S. (2014). Shame in patients with narcissistic personality disorder. *Psychiatry Research, 215,* 429–437. http://dx.doi.org/10.1016/ j.psychres.2013.11.019

Roche, M. J., Pincus, A. L., Conroy, D. E., Hyde, A. L., & Ram, N. (2013). Pathological narcissism and interpersonal behavior in daily life. *Person-*

ality Disorders: Theory, Research, and Treatment, 4, 315–323. http://dx.doi.org/10.1037/a0030798

Ronningstam, E. F., & Maltsberger, J. T. (1998). Pathological narcissism and sudden suicide-related collapse. Suicide and Life-Threatening Behavior, 28, 261–271.

Schoenleber, M., Berenbaum, H., & Motl, R. (2014). Shame-related function of and motivations for self-injurious behavior. Personality Disorders, 5, 204–211.

Stringer, B., van Meijel, B., Eikelenboom, M., Koekkoek, B., Licht, C. M. M., Kerkhof, A. J. F. M., . . . Beekman, A. T. F. (2013). Recurrent suicide attempts in patients with depressive and anxiety disorders: The role of borderline personality traits. Journal of Affective Disorders, 151, 23–30. http://dx.doi.org/10.1016/j.jad.2013.02.038

Vuong, Q. H. (1989). Likelihood ratio tests for model selection and non-nested hypotheses. Econometrica, 57, 307–333. http://dx.doi.org/10.2307/1912557

Wedig, M. M., Silverman, M. H., Frankenburg, F. R., Reich, D. B., Fitzmaurice, G., & Zanarini, M. C. (2012). Predictors of suicide attempts in patients with borderline personality disorder over 16 years of prospective follow-up. Psychological Medicine, 42, 2395–2404. http://dx.doi.org/10.1017/S0033291712000517

Wiklander, M., Samuelsson, M., Jokinen, J., Nilsonne, A., Wilczek, A., Rylander, G., & Åsberg, M. (2012). Shame-proneness in attempted suicide patients. BMC Psychiatry, 12, 50. http://dx.doi.org/10.1186/1471-244X-12-50

Wright, A. G. C., Pincus, A. L., & Lenzenweger, M. F. (2012). An empirical examination of distributional assumptions underlying the re-

lationship between personality disorder symptoms and personality traits. Journal of Abnormal Psychology, 121, 699–706. http://dx.doi.org/10.1037/a0029042

Yen, S., Shea, T., Pagano, M., Sanislow, C. A., Grilo, C. M., McGlashan, T. H., . . . Morey, L. C. (2003). Axis I and axis II disorders as predictors of prospective suicide attempts: Findings from the collaborative longitudinal personality disorders study. Journal of Abnormal Psychology, 112, 375–381. http://dx.doi.org/10.1037/0021-843X.112.3.375

Yen, S., Shea, M. T., Sanislow, C. A., Grilo, C. M., Skodol, A. E., Gunderson, J. G., . . . Morey, L. C. (2004). Borderline personality disorder criteria associated with prospectively observed suicidal behavior. American Journal of Psychiatry, 161, 1296–1298. http://dx.doi.org/10.1176/appi.ajp.161.7.1296

Yen, S., Shea, M. T., Sanislow, C. A., Skodol, A. E., Grilo, C. M., Edelen, M. O., . . . Gunderson, J. G. (2009). Personality traits as prospective predictors of suicide attempts. Acta Psychiatrica Scandinavica, 120, 222–229. http://dx.doi.org/10.1111/j.1600-0447.2009.01366.x

Zanarini, M. C., Frankenburg, F. R., Sickel, A. E., & Yong, L. (1996). The Diagnostic Interview for DSM–IV Personality Disorders (DIPD-IV). Belmont, MA: McLean Hospital.

Zanarini, M. C., Skodol, A. E., Bender, D., Dolan, R., Sanislow, C., Schaefer, E., . . . Gunderson, J. G. (2000). The Collaborative Longitudinal Personality Disorders Study: Reliability of Axis I and II diagnoses. Journal of Personality Disorders, 14, 291–299. http://dx.doi.org/10.1521/pedi.2000.14.4.291