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Predicting Future Suicide Attempts among Depressed Suicide Ideators: A 10-year Longitudinal Study

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Abstract

Suicidal ideation and attempts are a major public health problem. Research has identified many risk factors for suicidality; however, most fail to identify which suicide ideators are at greatest risk of progressing to a suicide attempt. Thus, the present study identified predictors of future suicide attempts in a sample of psychiatric patients reporting suicidal ideation. The sample comprised 49 individuals who met full DSM-IV criteria for major depressive disorder and/or dysthymic disorder and reported suicidal ideation at baseline. Participants were followed for 10 years. Demographic, psychological, personality, and psychosocial risk factors were assessed using validated questionnaires and structured interviews. Phi coefficients and point-biserial correlations were used to identify prospective predictors of attempts, and logistic regressions were used to identify which variables predicted future attempts over and above past suicide attempts. Six significant predictors of future suicide attempts were identified – cluster A personality disorder, cluster B personality disorder, lifetime substance abuse, baseline anxiety disorder, poor maternal relationship, and poor social adjustment. Finally, exploratory logistic regressions were used to examine the unique contribution of each significant predictor controlling for the others. Co-morbid cluster B personality disorder emerged as the only robust, unique predictor of future suicide attempts among depressed suicide ideators. Future research should continue to identify variables that predict transition from suicidal thoughts to suicide attempts, as such work will enhance clinical assessment of suicide risk as well as theoretical models of suicide.

Keywords

suicide; depression; risk factors; longitudinal design; Cluster B personality disorders

Suicide is the 10_{th} leading cause of death in the United States and the 9_{th} leading cause of death in Canada killing approximately 35,000 Americans and 3,700 Canadians yearly (Centers for Disease Control (CDC), 2011; Statistics Canada, 2008). Furthermore, in

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Contributors:
DNK designed the original study and collect the data. AMM and EDK formulated the specific research questions as well as the analytic approach. AMM conducted the literature searches, performed the analyses, and wrote the first draft of the manuscript. All authors contributed to the writing of and have approved the final manuscript.

epidemiological studies in the United States, approximately 4.6% of adults report making a suicide attempt, while 14% of adults report having seriously thought about committing suicide (Cougle et al., 2009). The relatively high rates of suicidality in the general population underscore the urgency in identifying and helping those at greatest risk.

Research has identified many risk factors for suicidality. These include most mental disorders, such as mood, anxiety, and substance disorders (Gould et al., 1998; Nock et al., 2009; Vanderwerker et al., 2007), several personality disorders (Chioqueta & Stiles, 2004; Schneider et al., 2008), and other psychosocial characteristics such as neuroticism, hopelessness, lack of social support, childhood abuse, and low educational attainment (Brezo et al., 2006; Brezo et al., 2007; Fergusson et al., 2003; Nock et al., 2008; Vanderwerker et al., 2007). Many clinical guidelines outlining the assessment of suicide risk have incorporated this research (Rudd & Joiner, 1998; American Psychiatric Association, 2003).

While research has made great strides in identifying risk factors for suicidality, close analysis of the literature suggests that most of these risk factors fail in an important respect: they do not help identify which suicide ideators are at greatest risk for progressing to a suicide attempt. This is a crucial issue since most people who ideate (have suicidal thoughts) do not actually make a suicide attempt. Data from both the National Comorbidity Study and its replication help illustrate this limitation. In these studies, the presence of each Axis I disorder robustly differentiated suicide ideators from non-suicidal controls and suicide attempters from controls, but negligibly differentiated suicide attempters from suicide ideators (Kessler et al., 1999; Nock et al., 2009).

The distinction between attempters and ideators is vital because clinical practice is often concerned with identifying which patients with suicidal ideation are at greatest risk of attempting. Risk assessment has direct implications for case conceptualization, treatment decisions, and safety planning, and therefore identifying which ideators are at greatest risk for an attempt is crucial. Moreover, financial resources are allocated based on perceived risk, and individuals' personal freedoms are limited by involuntary hospitalizations when physicians establish that their risk level is high. A better understanding of what factors put certain ideators at risk of acting on their thoughts would empirically inform these critical decisions.

The literature examining differences between suicide attempters and ideators is limited, and filled with null and mixed results. Notably, many variables demonstrated to be generally related to suicidality in other studies fail to reliably distinguish attempters from ideators including: specific Axis I diagnoses (Kessler, et al. 1999; Nock et al., 2009), many personality traits (reviewed in Brezo et al., 2006 and O'Connor, 2007), socioeconomic indicators (Brezo et al., 2007; Conrad et al., 2009; Zhang et al., 2005), medical conditions (Druss & Pincus, 2000; ten Have et al., 2009), a history of physical abuse (Benda, 2003; Brezo et al., 2008) and low self-esteem (Bearman & Moody, 2004; Benda, 2003; Overholser et al., 1995).

Other variables show mixed results or have not yet been replicated. For example, four studies found that female gender was a risk factor for attempter versus ideator status (Brezo et al., 2007; Friedman et al., 1987; Gould et al., 1998; Kessler et al., 1999), but six other studies failed to replicate the gender effect (Conrad et al., 2009; Fairweather et al., 2006; Gureje et al., 2007; Pirkis et al., 2000; Rudd et al., 1996; ten Have et al., 2009). Similarly, a study of childhood sexual abuse found that it significantly, but weakly, differentiated female attempters from ideators (OR= 1.21) (Brezo et al., 2007), but two other studies found no effect childhood sexual abuse (Bearman & Moody, 2004; Benda, 2003). Harm avoidance

differentiated depressed suicide attempters from depressed suicide ideators, but this finding has not yet been replicated (Conrad et al., 2009).

Among youth, the findings are somewhat more consistent, though they have been studied less thoroughly. Recent stressful life events (Asarnow et al., 2008; King et al., 2001), having a suicidal friend (Asarnow et al., 2008; Bearman & Moody, 2004; Friedman et al., 1987), the presence of substance abuse (Asarnow et al., 2008; Gould et al., 1998) and the presence of a disruptive or externalizing disorder (Asarnow et al., 2008; Brezo et al., 2007) have each been found to differentiate attempters from ideators. These findings were each replicated in two to three studies.

Research is needed to identify variables that best discriminate between attempters and ideators, particularly among adults; individuals with depression are an ideal diagnostic group in which to examine this question. Major depressive disorder is associated with increased suicide risk and is the only Axis I disorder that includes suicidality as a symptom (Kessler et al., 1999; Nock et al., 2009; Osby et al., 2001). Between 2.2-8.6% of individuals with major depression die by suicide (Blair-West et al., 1999; Bostwick & Pankratz, 2000; Brådvik et al. 2008; Inskip et al., 1998). The percent of individuals with depression who report suicidal ideation ranges from 5% among an elderly population to 50% among a young adult sample (Callahan et al., 1996; Fergusson et al., 2003). As in the general population, only a portion of depressed individuals with suicidal ideation act on their thoughts and progress to a suicide attempt. For example, among a depressed young adult sample, one-third of the ideators reported an attempt (Fergusson et al., 2003). Among depressed adult outpatients at a psychiatry clinic, approximately half of the participants reporting lifetime ideation also reported an attempt (Asnis et al., 1993).

As in other populations, among depressed individuals it is difficult to distinguish attempters from ideators. For example, a cross-sectional study of depressed inpatients found that employment status, overall psychological distress, depression severity, Axis I co-morbidity, and overall Axis II comorbidity did not distinguish attempters from ideators (Conrad et al., 2009). However, a longitudinal study of community members with a depressive diagnosis found that comorbid anxiety and substance use disorders were both predictive of suicide attempts when accounting for baseline ideation (Bolton et al., 2010). Notably, in both studies co-morbid borderline personality disorder was significantly associated with attempts over ideation. However, another study found that borderline personality did not distinguish individuals who experienced ideation versus attempts during a major depressive episode, whereas the severity of depression, anxiety and substance use did (Sokero et al., 2003).

The present study utilized a longitudinal design to isolate risk factors that identify ideators who make suicide attempts. Specifically, this study followed a sample of depressed suicide ideators for 10 years, and identified the baseline psychological characteristics that predicted which ideators went on to attempt suicide during the 10-year follow-up period. Our research design mirrors a common situation faced by clinicians in which a client presents with suicidal ideation and the clinician must assess risk of a future attempt. The research design also helps enhance theoretical models of suicide that seek to predict and explain the transition from suicidal thoughts to behaviors.

Methods

Participants

Data were collected as part of a larger project that examined the naturalistic course of depressive disorders over 10 years (Klein et al., 2006). Participants were outpatients who met full DSM-IV criteria for major depressive disorder and/or dysthymic disorder as

determined by structured diagnostic interview. They were recruited from consecutive admissions to the State University of New York at Stony Brook (SUSB) Hospital Outpatient Psychiatric Clinic and the SUSB Psychology Center. The sample was supplemented by referrals from the SUSB Student Counseling Center, and a community mental health center outpatient clinic.

The study design was in accordance with the Declaration of Helsinki and approved by the Stony Brook University Institutional Review Board. Written informed consent was obtained from all study participants after a complete description of the study. Participants completed an initial evaluation and a series of self-report questionnaires detailed below. These measures assessed Axis I and II diagnoses, symptom severity, personality traits, hopelessness, trauma history, and social support. Follow-up evaluations were conducted at 30, 60, 90, and 120 months. Visits were conducted in person whenever possible; otherwise they were completed over the phone. Interviewers included a doctoral-level clinical psychologist, a master's-level psychiatric social worker, and graduate students in clinical psychology. All interviewers completed formal training workshops on the instruments and participated in regular supervision throughout the course of the study. For the purposes of the present study, the only item used from the follow-up visit data was the interviewer's rating of whether the respondent had attempted suicide since the previous assessment. Of the 66 participants reporting ideation at baseline, follow-up data was available for 49 (74%). At baseline, the sample ranged in age from 18-51 with a mean of 30 years. Participants were predominantly female (75%) and almost exclusively Caucasian (91%).

Measures

Suicidality—Suicide ideation was coded as present at baseline if it was either reported during the Structured Clinical Interview for DSM-III-R (SCID; Spitzer et al., 1990) or endorsed on the Inventory to Diagnose Depression (IDD; Zimmerman et al., 1987). The presence of past suicide attempts was assessed as part of the SCID. Attempted suicide during follow-up intervals was assessed using a semi-structured interview designed to assess the course of psychopathology, the Longitudinal Interval Follow-Up Evaluation (LIFE; Keller et al., 1987).

Diagnostic and clinical variables—Axis I disorders were assessed using the SCID (Spitzer at al., 1990). As described in a previous paper, the reliability of the SCID in this study was assessed using both paired rater and test-retest designs (Lizardi et al., 1995). Kappas for paired raters ranged from .78-.90 for depression diagnoses. Kappas for test-retest reliability after 6 months were .61-.65 (Lizardi et al., 1995). The severity of depressive symptoms was assessed using the Hamilton Depression Rating Scale (HAM-D; Miller et al., 1985), a 21-question clinician-rated measure that focuses on the worst week of the patient's current major depressive episode. Axis II disorders were assessed using the Personality Disorder Examination (PDE; Loranger et al., 1987). This semi-structured interview provides both a categorical and dimensional score for each of the 10 personality disorders. The Eysenck Personality Questionnaire (EPQ; Eysenck et al., 1985) is a widely used personality inventory consisting of three scales: neuroticism, extroversion, and psychoticism. The Depressive Experiences Questionnaire (DEQ; Blatt et al., 1976) assessed two characterological configurations associated with depression - the anaclitic (dependent) and introjective (self-critical). The Beck Hopelessness Scale (BHS; Beck, 1988) is a 20-item self-report inventory that was designed to measure three aspects of hopelessness: feelings about the future, loss of motivation, and expectations.

Psychosocial variables—The Weissman Social Adjustment Scale (SAS; Weissman & Bothwell, 1976) is a self-report measure that assesses behavior, interpersonal functioning,

and affect related to six role areas that are summed to a total score. The LIFE (Keller et al., 1987) provided a second, interview-based, measure of psychosocial functioning. It also included an item, adapted from the Life Events and Difficulties Schedule (LEDS; Brown & Harris, 1978) that assessed the presence of a confidante (friend or partner). The Early Home Environment Interview (EHEI; Lizardi et al., 1995) is a semi-structured interview that assesses five aspects of the early home environment before age 15: loss, physical abuse, sexual abuse and the quality of the relationship with each parent. Loss, physical abuse, and sexual abuse are scored as present or absent. Parental relationships are rated on continuous scales.

Description of Suicide Attempts During Study

Of the 49 depressed suicide ideators who were assessed at baseline, 13 (26.5%) attempted suicide at least once during the 10-year follow-up and 36 did not. Attempters had a median of 3 attempts over the 10 years (range = 1-12). Approximately 2/3 of attempters had their first post-baseline attempt within 2 ½ years, while the other 1/3 had their first post-baseline attempt between 2 ½ - 5 years.

Analytic Approach

First, attempters and non-attempters were compared on baseline diagnostic and clinical characteristics to determine which factors predicted subsequent attempts. The relationship between predictors and subsequent attempts was examined by calculating phi coefficients (φ) for dichotomous predictor variables and point-biserial correlations (r_{pb}) for dimensional predictor variables. Second, logistic regressions were used to control for past attempts. Finally, exploratory logistic regressions were used to examine the unique contributions of significant predictors.

Results

Prediction of Suicide Attempts: Direct Effects

Attempters and non-attempters were compared on baseline diagnostic and clinical characteristics to determine which factors prospectively predicted suicide attempts. Direct effects (phi coefficients and point-biserial correlations) for all predictor variables are reported in Table 1. Phi coefficients and point-biserial correlations greater than .28 were significant at the $p < .05$ level.

Regarding demographic indicators, the only predictor of attempts was lower socioeconomic status (r_{pb} =.31). Gender, marital status, age, and education were not significantly related to future attempts.

Regarding Axis I disorders, a substance abuse diagnosis in the past, a substance abuse diagnosis at baseline, and an anxiety disorder diagnosis at baseline each predicted attempts (φs equal .40, .28, and .30, respectively). The severity of depression at baseline was not associated with future suicide attempts. With respect to Axis II disorders, cluster A, B, and C personality disorder symptoms all predicted the occurrence of an attempt (r_{pb}s equal .41, .50, and .31, respectively). In contrast, none of the personality traits, including extraversion, neuroticism, psychoticism, self-criticism, and dependency, predicted future attempts.

Finally, regarding other clinically relevant psychosocial variables, self-reported difficulty with social adjustment predicted future attempts (r_{pb} =.41), while an interviewer-rated measure produced an association just falling short of statistical significance (r_{pb} =.23). Baseline hopelessness was associated with a future attempt (r_{pb} = .35). Among the traumatic history variables, only poor maternal relationship (r_{pb} = .37) predicted a future attempt.

Physical abuse, sexual abuse, neglect, and parental loss were not predictive of future attempts among ideators ($\varphi = -.02 - .23$). As expected, having made a past suicide attempt predicted subsequent suicide attempts ($\varphi = .32$).

Prediction of Suicide Attempts: Controlling for Past Attempts

The next set of analyses determined which variables could predict subsequent attempted suicide among ideators while controlling for past attempts. Separate logistic regressions were run for each significant variable while controlling for past suicide attempts (see Table 2). Multiple comparisons may increase Type I error, thus the overall pattern of results was interpreted. Most significant direct predictors continued to be predictive of future suicide attempts when controlling for past attempts, including lifetime substance abuse, baseline anxiety, cluster A and B personality disorder symptoms, poor social adjustment, and poor maternal relationship. Only socioeconomic status, substance use at baseline, cluster C personality disorder symptoms, and hopelessness lost their predictive value.

As personality disorder clusters were found to be strong predictors of attempts, we examined which individual personality disorders prospectively predicted attempted suicide among ideators when past attempts were controlled for (table available from authors). Borderline personality disorder was the strongest predictor of attempts. Narcissistic, antisocial, paranoid, and schizotypal symptoms also predicted future attempts.

Prediction of Suicide Attempts: Unique Effects

We next sought to examine which variables contributed uniquely to the prediction of attempted suicide. One analytic approach is to simultaneously enter several variables into a logistic regression. However, this approach was not feasible given sample size constraints. Therefore, all possible pairs of significant predictors were examined in separate logistic regressions (i.e., each logistic regression contained two simultaneously entered predictor variables; tables available from the authors). Cluster B personality disorder was the only robust unique predictor. Specifically, in each and every logistic regression that included Cluster B personality disorder diagnosis as one of the two variables entered simultaneously, Cluster B personality disorder diagnosis accounted for unique variance in attempted suicide. Furthermore, when paired with Cluster B personality disorder diagnosis in a logistic regression, each of the other variables no longer predicted attempted suicide. Partial correlations revealed that, after controlling for Cluster B personality disorder symptoms, significant predictors had weak relationships (trending toward significance) with future suicide attempt (see Table 3).

Discussion

The goal of this study was to identify prospective predictors of suicide attempts among ideators. Previous research has identified numerous risk factors associated with suicidality in general, however it remains unclear which factors predict progression to a suicide attempt among people already contemplating suicide. These analyses addressed this question by examining a broad spectrum of clinical and psychosocial variables in depressed ideators and identifying which were predictive of suicide attempts during the subsequent 10 years. Our results suggest that among depressed individuals with suicidal ideation, the strongest predictor of a future attempt is a co-occurring personality disorder, particularly from cluster B. Importantly, many variables typically regarded as important risk factors for suicide, such as hopelessness, severity of depression symptoms, and history of abuse, were minimally or negligibly useful for predicting future suicide attempts among depressed individuals presenting with suicidal ideation. Our study design mirrors a specific but common clinical situation, in which the presence of suicidal ideation has already been documented, and the

challenge is to identify which ideators are at greatest risk for progressing to a suicide attempt.

Based on our findings, Cluster B personality disorders are strong and unique predictors of future suicide attempts among depressed ideators. Notably, borderline personality disorder is the first robustly replicated predictor of attempts over and above ideation in the literature (Conrad et al., 2009; Bolton et al., 2010). Borderline personality has long been associated with suicide attempts and is the only other disorder in the DSM-IV, aside from depression, that includes suicidality as a symptom (APA, 2000; Yen et al., 2003). Since Axis I disorders are generally more episodic and personality disorders are by definition more long term and chronic; it follows that they may be more important in predicting suicide risk over the long-term. A study of inpatients found that those with both major depressive disorder and borderline personality disorder were more likely to have attempted suicide and to have a greater number of suicide attempts than individuals with either depression or borderline personality disorder alone (Soloff et al., 2000). The combination of negative affect that marks depressive disorders with the emotion dysregulation, disinhibition, and interpersonal skill deficits that characterize cluster B disorders, may be an especially pernicious combination that fosters the transition from ideation to attempt.

A further explanation for the importance of Cluster B personality disorder in predicting future attempts among depressed ideators relates to Joiner's interpersonal-psychological theory (Joiner, 2005). This theory posits that three domains must be present in an individual for suicide to occur. The first two domains, perceived burdensomeness and thwarted belongingness, confer the desire for suicide (e.g., suicidal ideation). The third domain, acquired capability, is believed to be necessary in order for an individual to undertake potentially lethal self-harm. Habituating to physical pain and thoughts of death helps one overcome the fearsomeness of attempting suicide. Cluster B personality disorders include two important symptoms from borderline personality disorder that may directly increase the acquired capability for suicide. The first is non-suicidal self-injury, which, though a distinct behavior from suicide, facilitates habituation to causing pain and injury to oneself. The second is engaging in impulsive and damaging behaviors such as reckless driving, risky drug use, and binge eating, many of which increase exposure to painful and frightening events. These symptoms may make individuals more capable of acting on suicidal thoughts and thus help explain the relationship of Cluster B personality disorder to risk of future suicide attempts.

As noted above, many of the risk factors often associated with suicidality in general were not predictive of attempts in this high-risk group of ideators. Neither hopelessness nor the severity of depression predicted future attempts after controlling for past attempts, even though these are both considered important predictors of suicidality (Bolton et al., 2008; reviewed in Brezo et al., 2006). One possibility is that these variables are relevant in the development of suicidal thoughts, but less relevant for leading some but not others to act on these thoughts and progress to a suicide attempt. Hopelessness and depression severity may contribute to the desire for suicide, but not to acting on those thoughts, as would fit with Joiner's interpersonal-psychological theory.

Alternatively, due to their acute nature, hopelessness and depression severity may have predictive value for a short time span, perhaps just in the days or weeks before an attempt, but less value for the long-term prediction of attempted suicide such as the 10-year time-span in the present study. Though some have found that scores on the Beck Hopelessness Scale predicted suicide death 10 years in the future, (Beck et al., 1985), others found that hopelessness no longer accounted for unique variance after accounting for depression diagnosis and baseline ideation level (Beck & Steer, 1989; Brown et al., 2000). This pattern

suggests that hopelessness may relate to future suicidality because of its association with mood disorder diagnoses and past suicidal ideation.

Also consistent with previous research (Bolton et al., 2010; Joiner et al., 2005), in the present study the presence of a past attempt was significantly and uniquely predictive of a future attempt. However, a history of previous attempts only accounted for a modest proportion of variance in future attempts and a number of other variables contributed significant and unique variance. Specifically, six variables – Cluster B personality disorder, Cluster A personality disorder, anxiety disorders, substance abuse disorders, difficult social adjustment, and poor maternal relationship – predicted future attempts over and above past attempts.

Interestingly, of the six predictors noted above, only Cluster B personality disorder exhibited a consistent, unique relationship to future suicide attempts. Anxiety disorders, substance disorders, social adjustment, maternal relationship, and Cluster A personality disorder each exhibited non-significant relationships to subsequent suicide attempts when controlling for Cluster B personality disorder. As these predictors are likely related to Cluster B personality disorder symptoms it is possible that their predictive power in univariate models may be predominantly explained by co-occurring personality disorders. However, it is also possible that the small sample size and reduced statistical power prevented us from detecting unique relationships. For example, partial correlations between each of these five variables and attempted suicide (partialing out Cluster B personality disorder) ranged between .20 and .25, suggesting that they may indeed uniquely account for modest variance in subsequent suicide attempts. Previous studies have not controlled for personality disorders when examining the relationship of comorbid Axis I disorders or other psychosocial difficulties to subsequent attempted suicide. Future research will be needed to determine which of these variables demonstrate unique and robust relationships to subsequent suicide attempts among individuals presenting with suicide ideation.

The results of this study must be interpreted with consideration for its limitations. The first limitation is the small sample size. This limited the power of the analyses and the number of variables that could be included in a single model. Additionally, sample size dictated the use of analytic approaches that increased the chance of Type I error. Second, the sample consisted of adults with depressive disorders and it will be important for future research to examine whether findings generalize to other ages or diagnostic groups. A final consideration is the time between the assessment of the risk factors and the occurrence of the attempt, which in this study was up to 10 years. The relevance of some predictive factors may vary greatly depending on the length of follow-up time. For example, variables such as symptom severity and stressful interpersonal events, which are more acute and time-limited compared to personality disorders, may only be predictive of attempts over a short time-frame. In addition there may be a number of state-dependent predictive variables that are important in the days or weeks before an ideator attempts, but that would not be apparent if assessed years earlier.

In summary, Cluster B personality disorders appear to be strong risk factors for future suicide attempts among depressed individuals who are already considering suicide. Furthermore, many of the standard risk factors for suicidality do not appear to be useful long-term predictors of future attempts. It is essential that future suicidality research seek to clearly differentiate risk factors that do and do not help predict transition from suicidal thoughts to suicide attempts.

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Table 1
Direct Effects of Predictor Variables on Suicide Attempts among Ideators

Demographic	**Attempters**	**Ideators**	**Statistical analyses**	
Variable	**% (*n*)**	**% (*n*)**	**φ**	***p***
Gender			.127	.373
Female	84.6 (11)	72.2 (26)		
Marital status			.073	.609
Married	23.1 (3)	30.6 (11)		
Race			.010	.942
White	92.3 (12)	91.7 (33)		
	M (*SD*)	*M* (*SD*)	r_{pb}	*p*
Age	30.5 (7.9)	30.1 (10.0)	.019	.896
SES[1]	3.7 (1.0)	2.9 (1.1)	.310	.034
Education	12.8 (1.6)	13.3 (2.4)	−.114	.437
Axis I & II	Attempters	Ideators	Statistical analyses	
Variable	% (*n*)	% (*n*)	φ	*p*
Anxiety Disorder at baseline	53.8 (7)	22.2 (8)	.303	.034
Anxiety Disorder lifetime	53.8 (7)	36.1 (13)	.159	.265
Substance Abuse Disorder baseline	30.8 (4)	8.3 (3)	.283	.048
Substance Abuse Disorder lifetime	84.7 (11)	38.9 (14)	.404	.005
Any Personality Disorder	92.3 (12)	41.7 (15)	.450	.002
	M (*SD*)	*M* (*SD*)	r_{pb}	*p*
Hamilton depression score	29.6 (8.4)	31.7 (11.8)	.133	.364
Hopelessness	13.2 (5.9)	9.2 (5.5)	.351	.017
Cluster A PD symptoms	13.4 (8.9)	6.4 (6.1)	.405	.004
Cluster B PD symptoms	27.5 (9.3)	13.6 (11.0)	.500	<.001
Cluster C PD symptoms	19.9 (8.6)	14.2 (7.5)	.314	.028
Personality traits	Attempters	Ideators	Statistical analyses	
Variable	*M* (*SD*)	*M* (*SD*)	r_{pb}	*p*
Extraversion	11.0 (6.2)	12.0 (5.6)	−.040	.796
Neuroticism	19.7 (4.2)	15.9 (5.9)	.282	.061
Psychoticism	8.5 (3.3)	6.8 (3.6)	.229	.144
Self-criticism	75.9 (16.8)	68.0 (17.8)	−.032	.833
Dependency	96.0 (23.9)	95.6 (17.9)	.219	.143
Psychosocial	Attempters	Ideators	Statistical analyses	

Demographic	**Attempters**	**Ideators**	**Statistical analyses**	
Variable	**% (*n*)**	**% (*n*)**	**φ**	***p***
Variable	% (*n*)	% (*n*)	φ	*p*
Close friendship	69.2 (9)	80.6 (29)	−.120	.402
Past suicide attempt	69.2 (9)	33.3 (12)	.320	.025
Loss of parent before age 15	38.5 (5)	41.7 (15)	−.029	.840
Physical abuse	23.1 (3)	22.2 (8)	.009	.950
Sexual abuse	46.2 (6)	22.2 (8)	.234	.102
Neglect	15.4 (2)	16.7 (6)	−.015	.915
	M (*SD*)	*M* (*SD*)	r_{pb}	*p*
Poor maternal relationship	2.6 (1.6)	1.2 (1.6)	.367	.009
Poor paternal relationship	3.1 (1.7)	2.1 (1.8)	.250	.087
Social adjustment difficulty – interviewer-report	3.6 (0.7)	3.2 (0.7)	.226	.119
Social adjustment difficulty – self-report	2.8 (0.6)	2.30 (0.5)	.409	.005

[1] SES reported is the Hollingshead social class (1=highest level, 5=lowest level)

Table 2

Relationship between Individual Variables and Suicide Status Controlling for Past Attempts

Predictor	β	*SE* β	Wald's χ^2	*df*	e^{β}	95% C.I. for e^{β} Lower	Upper	*p*
Categorical								
Anxiety disorder at baseline	1.50	.742	4.10	1	4.49	1.05	19.22	.043
Past suicide attempt	1.58	.743	4.58	1	4.90	1.14	21.00	.032
Substance use at baseline	1.52	.906	2.82	1	4.57	0.78	26.99	.093
Past suicide attempt	1.46	.722	4.11	1	4.32	1.05	17.78	.043
Substance use lifetime	1.87	.869	4.61	1	6.46	1.18	35.43	.032
Past suicide attempt	1.04	.752	1.92	1	2.83	.649	12.36	.166
Personality disorder diagnosis	2.61	1.11	5.28	1	13.57	1.54	119.30	.019
Past suicide attempt	1.14	.762	2.23	1	3.12	.701	13.92	.135
Continuous								
SES	.684	.411	2.77	1	1.98	0.89	4.43	.096
Past suicide attempt	1.06	.740	2.05	1	2.89	.677	12.32	.152
Cluster A personality disorder	.826	.391	4.46	1	2.29	1.06	4.92	.035
Past suicide attempt	1.09	.751	2.12	1	2.98	.684	13.00	.146
Cluster B personality disorder	1.15	.427	7.21	1	3.14	1.36	7.25	.007
Past suicide attempt	.879	.795	1.22	1	2.41	.506	11.45	.269
Cluster C personality disorder	.661	.379	3.05	1	1.94	0.92	4.07	.081
Past suicide attempt	1.34	.724	3.42	1	3.81	0.92	15.73	.065
Hopelessness	.720	.425	2.88	1	2.06	0.89	4.73	.090
Past suicide attempt	1.46	.752	3.78	1	4.32	0.99	18.85	.052
Poor relationship with mom	.713	.349	4.18	1	2.04	1.03	4.04	.041
Past suicide attempt	1.41	.733	3.70	1	4.09	.973	17.19	.055
Social adjustment difficulty - SR	1.09	.450	5.84	1	2.97	1.23	7.17	.016
Past suicide attempt	2.00	.815	6.01	1	7.38	1.49	36.50	.014

Note: Separate logistic regressions were run in which each variable with a significant direct effect was entered simultaneously with past suicide attempts to predict future suicide attempts. Continuous variables were entered as standardized z-scores.

Table 3

Partial Correlations between Individual Variables and Suicide Attempts Controlling for Cluster B Personality Disorder Symptoms

	r	*p*
Cluster A personality disorder symptoms	.20	.179
Social adjustment difficulty	.24	.125
Anxiety disorder at baseline	.21	.154
Substance use lifetime	.22	.139
Poor relationship with mom	.25	.083