

Personality traits as prospective predictors of suicide attempts

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Objective: To examine higher order personality factors of negative affectivity (NA) and disinhibition (DIS), as well as lower order facets of impulsivity, as prospective predictors of suicide attempts in a predominantly personality disordered sample.

Method: Data were analyzed from 701 participants of the Collaborative Longitudinal Personality Disorders Study with available follow-up data for up to 7 years. Cox proportional hazards regression analyses was used to examine NA and DIS, and facets of impulsivity (e.g. urgency, lack of perseverance, lack of premeditation and sensation seeking), as prospective predictors of suicide attempts.

Results: NA, DIS and all facets of impulsivity except for sensation seeking were significant in univariate analyses. In multivariate models which included sex, childhood sexual abuse, course of major depressive disorder and substance use disorders, only NA and lack of premeditation remained significant in predicting suicide attempts. DIS and the remaining impulsivity facets were not significant.

Conclusion: NA emerged as a stronger and more robust predictor of suicide attempts than DIS and impulsivity, and warrants greater attention in suicide risk assessment. Distinguishing between facets of impulsivity is important for clinical risk assessment.

**S. Yen¹, M. T. Shea¹,
C. A. Sanislow², A. E. Skodol³,
C. M. Grilo², M. O. Edelen¹,
R. L. Stout¹, L. C. Morey⁴,
M. C. Zanarini⁵, J. C. Markowitz⁶,
T. H. McGlashan², M. T. Daversa⁴,
J. G. Gunderson⁴**

¹Department of Psychiatry and Human Behavior, Brown Medical School, Providence, RI, ²Department of Psychiatry, Yale Medical School, New Haven, CT, ³Sunbelt Collaborative and the University of Arizona College of Medicine, Phoenix, AZ, ⁴Department of Psychology, Texas A&M University, College Station, TX, ⁵Department of Psychiatry, McLean Hospital, Harvard Medical School, Boston, MA and ⁶Department of Psychiatry, New York State Psychiatric Institute, New York NY, USA

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Shirley Yen, PhD, Department of Psychiatry and Human Behavior, Brown Medical School, 700 Butler Drive, Providence, RI 02906, USA.
E-mail: shirley_yen_phd@brown.edu

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Significant outcomes

- Negative affectivity is a more robust prospective predictor of suicide attempts than DIS and impulsivity, remaining significant even after controlling for numerous other established risk factors, including disinhibition/impulsivity, childhood sexual abuse, sex, and course of major depressive disorders (MDD) and substance use disorders (SUD).
- DIS was not a significant prospective predictor of suicide attempts when controlling for negative affectivity and covariates (sex, childhood sexual abuse, and course of MDD and SUD).
- Among the impulsivity facets only lack of premeditation remained significant in a model with negative affectivity and covariates.

Limitations

- Sample limited to treatment-seeking individuals with personality disorder(s) and/or MDD.
- Negative affectivity and DIS, and facets of impulsivity were assessed using self-report measures, NEO Personality Inventory (NEO-PI) and Schedule for Non-adaptive and Adaptive Personality (SNAP). Although both are well-validated, they are not definitively established models of personality, and our internal consistency for the sensation seeking (E5) facet was only moderate.
- We were able to conduct analyses on those who had follow-up data. Those with follow-up data have lower scores on SNAP DIS and SNAP aggression than those who have only baseline data; participants lost to follow-up who on average had higher scores on DIS and aggression may have had suicide attempts that were not able to be assessed.

Introduction

Negative affectivity (a term often used interchangeably with neuroticism, negative temperament and negative emotionality) and disinhibition, arguably represent the personality traits that have been most frequently associated with suicide attempts (see (1) for a review). These personality traits are also presumed to underlie Cluster B personality disorders (PD) (2, 3), another well-established risk factor for suicidal behavior. A prior investigation using the Collaborative Longitudinal Personality Disorders Study (CLPS) sample found that affective instability, but not impulsivity, predicted suicide attempts over 2 years of follow-up (4). In this study, we seek to examine the higher order personality traits of negative affectivity and disinhibition that underlie the diagnostic criteria of affective instability and impulsivity, respectively, as prospective predictors of suicide attempts. The focus on these personality traits is concordant with a prominent psychobiological model of PD, which postulates these traits as intermediate phenotypes between biological endophenotypes and psychiatric disorders (2). Based on our previous non-significant findings for impulsivity, we also seek to examine whether specific facets of impulsivity (e.g. sensation seeking, lack of premeditation, urgency and lack of perseverance) predict suicidal behavior, as impulsivity may be too heterogeneous to be clinically relevant (5).

This report used data from the CLPS, a multi-site, naturalistic, follow-up study of four PDs, and a comparison condition of major depressive disorder (MDD) without PD. The present report extends prior work from our group by examining prospective data using 7 years of follow-up data, and by including covariates identified as significant predictors of suicide attempts in prior analyses (4, 6, 7).

Aims of the study

We seek to determine whether the personality traits of negative affectivity and disinhibition, or their interaction, and facets of impulsivity, predict suicide attempts over 7 years of follow-up in a predominately personality disorder sample.

Material and methods

The CLPS is a multi-site, naturalistic, prospective study of four PD groups: schizotypal (STPD), borderline (BPD), avoidant (AVPD), obsessive-compulsive (OCPD), and a comparison group of MDD without PD. The overall aims, design, assessment methodology and demographic charac-

teristics of the sample are detailed elsewhere (8). One of the aims of CLPS was to identify predictors of clinical outcomes such as suicidal behavior. Following is an overview of the study participants and assessment procedures relevant to the present investigation.

Participants

Participants between the ages of 18 and 45 years were recruited from treatment clinics affiliated with the four CLPS sites. Additional individuals who had been in current or past treatment were recruited from fliers and advertisements. Individuals with acute substance intoxication or withdrawal, active psychosis, cognitive impairment, or a history of schizophrenia, schizophreniform, or schizoaffective disorders were excluded from participation. Individuals were eligible to participate if they met diagnostic criteria as assessed by the Diagnostic Interview for DSM-IV Personality Disorders (DIPD-IV) (9) for at least one of the four PDs targeted in the CLPS or if they met criteria for the comparison group, MDD as assessed by the Structured Clinical Interview for DSM-IV Axis I Disorders – patient version (SCID-I/P) (10) without PD. Interviewers had masters or doctoral level training (or equivalent clinical experience) in a mental health-related discipline. Participants were interviewed at 6 months, 1 year and then annually following the baseline assessment. Each participant signed an informed consent, approved by the institutional review boards at the respective sites/institutions.

For inclusion in data analyses, participants had to have some follow-up data. This resulted in a sample of 701 participants, 129 of whom had made a suicide attempt during follow-up [because of missing values, models which included the childhood sexual abuse (CSA) variable were based on 628 participants, 114 of whom had made a suicide attempt during follow-up]. CLPS participants were recruited in two cohorts: 7 years of follow-up data are available for the original sample of 668 participants and 4 years of follow-up data are available for the second cohort of minority participants. Our retention rate for these samples is 80% and 68% respectively. Attrition analyses indicated no differences between those with and without follow-up data on Schedule for Non-Adaptive and Adaptive Personality (SNAP) NT, SNAP Impulsivity (IMP), NEO Personality Inventory (NEO), impulsivity, NEO self-discipline, NEO deliberation and NEO excitement seeking. However, those with follow-up data had lower baseline scores on SNAP aggression (AGG) ($t = 2.07, P = 0.04$) and SNAP DIS ($t = 2.2; P = 0.03$) than those who dropped-

out after the baseline interview. We conducted supplemental analyses examining the range and distribution of the AGG and DIS scores between participants with and without follow-up data, and did not observe a truncated range of higher scores among those with follow-up data on either scale.

Measures

Longitudinal interval follow-up evaluation (LIFE) (11). The longitudinal interval follow-up evaluation is a semi-structured interview rating system used for assessing the longitudinal course of psychiatric disorders and functioning including suicidal behaviors. Using information obtained from the interview, weekly Psychiatric Status Ratings (PSRs) are made for each axis I disorder present. Substance use disorders (SUD) (alcohol and drug combined) was rated on a three-point scale, indicating whether the individual meets full criteria (PSR3), is in partial remission (PSR2) or is in full remission (PSR1). Because MDD was among the central interests of study, it was rated on a six-point scale (full criteria = PSR6, PSR5; partial remission = PSR4, PSR3; full remission = PSR2, PSR1) to allow finer distinctions within categories. Good to excellent inter-rater and test-retest reliabilities have been established for several axis I disorders using a different sample in another longitudinal, naturalistic study with a similar assessment protocol (12).

Participants are asked whether they have engaged in any suicidal behavior and episodes are coded by month of occurrence. In addition, each reported suicidal behavior is rated for intent on a six-point continuum (categories include: obviously no intent, only minimal intent, definite but ambivalent, serious, very serious and extreme) and medical threat (categories include: no danger, minimal, mild, moderate, severe and extreme). For the purposes of this study, suicide attempts were distinguished from self-harm on the basis of ratings for suicide intent. In keeping with calls for a consistent definition of suicide attempts as self-injurious behaviors with non-fatal outcome in which there is some (non-zero) intent to kill himself/herself (13), we will define attempts as events with at least minimal intent to die. Participants who committed suicide were analyzed with attempters. Data from those who made suicidal gestures only, i.e. with no intent to die, were classified as non-attempters.

Diagnostic Interview for DSM-IV Personality Disorders (DIPD-N) (9). Questions on this semi-structured interview assess each criterion of the ten DSM-IV PDs. In this study, inter-rater and test-

retest reliability (kappa) of the DIPD-IV for three of the four study PD's were 0.68 and 0.69 for BPD, 0.68 and 0.73 for AVPD, and 0.71 and 0.74 for OCPD respectively. The inter-rater reliability sample was insufficient to calculate kappa for STPD; the test-retest kappa for STPD was 0.64 (14).

Structured Clinical Interview for DSM-IV Axis I Disorders – patient version (SCID-I/P) (10). The SCID-I/P is a semi-structured interview with demonstrated reliability used to diagnose major axis I disorders as defined by the DSM-IV. In the CLPS, reliability of SCID-I/P diagnoses ranged from 0.57 to 1.00 depending on the disorder, with a median kappa of 0.76. Test-retest reliability ranged from 0.35 to 0.78, with a median kappa of 0.64. Inter-rater reliability kappa and test-retest kappa for specific axis I disorders can be found elsewhere (15).

Schedule for non-adaptive and adaptive personality (16). The SNAP is a 425 true-false item self-report questionnaire designed to assess personality characteristics in both the normal and abnormal range. There are 12 lower order trait dimensions that load primarily onto one of three higher order factors: Positive temperament, NT or DIS; each also marked by a corresponding scale. Internal consistency estimates in our study sample for the scales of interest are: 0.90 (NT), 0.82 (DIS), 0.80 (IMP) and 0.88 (AGG).

The NEO-personality inventory – revised (NEO-PI-R) (17). The NEO-PI-R is a self-report questionnaire designed to comprehensively assess the five factor model of personality. These five factors include neuroticism (N), extraversion (E), openness to experience (O), agreeableness (A) and conscientiousness (C). Each factor has six facets. Per Whiteside & Lynam (5) we examined impulsivity (N5) to correspond with urgency, self-discipline (C5) to correspond with perseverance, deliberation (C6) to correspond with planning/premeditation and excitement seeking (E5) to correspond with sensation seeking. The 240 items (eight items per each facet) are answered on a five-point Likert scale. Internal consistency reliabilities for the five domain scales in the standardization sample ranged from 0.86 to 0.95; for the facet scales, they ranged from 0.56 to 0.81 (18). Internal consistency reliabilities for the facets of interest in this sample are 0.68 (N5), 0.81 (C5), 0.76 (C6) and 0.59 (E5).

Data analyses

Correlation analyses between trait predictor variables were conducted, and collinearity diagnostics,

tolerance and variance inflation factor (VIF) were executed to identify any problematic covariances for regression analyses.

Cox proportional hazards regression analyses were conducted to predict suicide attempts during follow-up, with prospectively assessed personality traits as the predictors. The primary traits of interest were higher order personality factors of NA (assessed by SNAP NT) and DIS (assessed by SNAP DIS). Secondary traits of interest include various facets of disinhibition and impulsivity including urgency (NEO N5), perseverance (NEO C5), planning/premeditation (NEO C6), sensation seeking (NEO E5), impulsivity and AGG (SNAP). Cox proportional hazards regression allows for the use of all available data, including censored observations (i.e. data from participants who did not make a suicide attempt) during the 7-year follow-up interval. For participants in the second cohort with 4 years of follow-up data, the remainder of the interval will be censored. However, to mitigate problems with associated events, only the first suicide attempt of each participant was used as the outcome.

The first set of analyses was performed at the univariate level for each of these eight predictors. The second set included the following interaction analyses: i) SNAP NT by SNAP DIS to determine whether disinhibited individuals are at higher risk for suicide attempts in the context of high NA; ii) SNAP IMP by SNAP AGG to determine whether having both impulsivity and aggressiveness accentuates the risk for suicide attempts; iii) SEX by NT and SEX by DIS to determine whether the effect of NT or DIS on suicide attempts differs by gender; and iv) CSA by NT and CSA by DIS to determine whether the effect of NT or DIS on suicide attempts differs by history of CSA. The third set of analyses are multivariate models which include NT, DIS (or impulsivity facet) and covariates. Previous examinations in this sample have identified female gender, reporting a history of CSA, course of major depression and SUD as significant predictors of suicide attempts (7). Therefore, these variables are included in the full model as covariates. For trait predictors, we utilize the prospective assessment most recently preceding the first suicide attempt. For covariates, we use baseline assessment of sex and CSA, and weekly PSR scores for course of MDD and SUD. A family wise Bonferroni correction for multiple comparisons has been applied for each set of analyses, resulting in a significance level of 0.006 (0.05/8) for each univariate and full model analyses analyses, and 0.01 for all other (interaction, attrition and demographic) analyses.

Results

Of the 701 participants with follow-up data, 128 had made a suicide attempt during the first 7 years of follow-up. This includes six participants who committed suicide, as reported to us by a family member and/or verified by death certificate. Seventy-four attempters (58% of attempters) reported attempts in multiple intervals. Thirty-nine participants reported a suicide attempt during the first 6 months of follow-up. Twenty participants reported a first attempt (eight repeat attempters) between months 7 and 12; 34 first (13 repeat) attempts in the second year, nine first (19 repeat) attempts in the third year, nine first (11 repeat) attempts in the fourth year, five first (eight repeat) attempts in the fifth year, six first (14 repeat) attempters in the sixth year and seven first (seven repeat) attempts in the seventh year. Among those who reported a suicide attempt, 74.4% met criteria for BPD compared with 26% who reported no suicide attempts [$\chi^2(1) = 108.3$; $P < 0.001$]. AVPD was also more prevalent among suicide attempters compared with non-attempters [60.5% vs. 46.9%; $\chi^2(1) = 7.8$; $P = 0.005$], while the rate of OCPD was significantly lower among attempters [24% vs. 43.2%; $\chi^2(1) = 16.13$; $P < 0.001$]. The most frequently observed baseline axis I disorders among suicide attempters during follow-up were MDD (77.5% attempters vs. 77.8% non-attempters; NS), substance abuse/dependence [54.3% attempters vs. 32.9% non-attempters; $\chi^2(1) = 20.7$; $P < 0.001$], alcohol abuse/dependence [58.1% attempters vs. 36.2% non-attempters; $\chi^2(1) = 21.1$; $P < 0.001$] and post-traumatic stress disorder [49.6% vs. 26.0%; $\chi^2(1) = 27.6$; $P < 0.001$]. Less frequently reported, but statistically significant, was panic disorder [36.4% attempters vs. 25.2% non-attempters; $\chi^2(1) = 6.73$; $P = 0.009$]¹

Table 1 depicts demographics data for the participants who have and have not reported a suicide attempt during follow-up. The only significant demographic difference between these groups was sex [$\chi^2(1) = 6.68$; $P = 0.01$], with more women reporting suicide attempts. There were no significant differences in age, education level, race/ethnicity, marital status and employment status at baseline between attempters and non-attempters.

As an initial step to determine the degree of inter-correlation between variables, bivariate Pearson's

¹Results from a prior investigation found that AVPD, OCPD, PTSD and panic disorder were not significant in a multivariate analysis which included other disorders (7).

Table 1. Demographic data by suicide attempt (SA) group

Baseline demographics	SA (n/%) n = 129	No SA (n/%) n = 572	$\chi^2(1)$
Age at intake (M/SD)	32.5 (7.9)	32.6 (8.2)	0.06†
Sex (% female)	95 (73.6)	352 (61.5)	6.68**
Race/ethnicity (% Caucasian)	94 (72.9)	394 (68.1)	0.79
Marital status (% married/cohabit)	33 (25.6)	141 (24.7)	0.05
Education (% HS, GED or less)	43 (33.3)	146 (25.5)	3.26
Employment (% employed)	39 (30.2)	229 (40.0)	4.28*

* $P < 0.05$; ** $P < 0.01$.

†T-statistic.

correlations were calculated among all trait predictors (Table 2). Our main higher order predictors, NT and DIS, were significantly correlated ($r = 0.20$; $P < 0.001$). The tolerance (0.96) and VIF (1.04) indices suggest that the degree of collinearity is not problematic for regression analyses. Similarly, although several of the lower order impulsivity trait predictors were significantly correlated with NT, none indicated problematic collinearity.

A series of Cox proportional hazards regression analyses (univariate, test of interactions and multivariate) was conducted to compare the extent to which NT, DIS and facets of impulsivity prospectively predicted individuals who made a suicide attempt. Univariate analyses revealed that all were significant except for excitement seeking (Table 3). NT score was higher among suicide attempters compared with non-attempters, and significantly predicted suicide attempts during follow-up

(HR = 1.11, $P < 0.0001$). Similarly, scores on SNAP DIS (HR = 1.07; $P < 0.0001$), IMP (HR = 1.10, $P < 0.0001$), AGG (HR = 1.06, $P < 0.0001$) and NEO impulsivity (HR = 1.06, $P = 0.001$) were higher among suicide attempters and prospectively predicted suicide attempts. Scores on NEO self-discipline and deliberation were lower among attempters and prospectively predicted suicide attempts during follow-up (HR = 0.96, $P = 0.002$ and HR = 0.91, $P < 0.0001$ respectively).

The second set of analyses, tests of interaction terms, found only a marginally significant interaction (not significant with Bonferroni correction) for SNAP IMP by SNAP AGG (HR = 1.03, $P = 0.02$) suggesting that these traits exacerbate each others effects on suicidal behavior. The interaction between SNAP NT and SNAP DIS was not significant (HR = 1.01, $P = 0.48$), and the interaction between sex and NT and sex and DIS, and CSA and NT and CSA and DIS were not significant in predicting suicide attempts during follow-up.

Table 4 depicts results from the full model Cox proportional hazards regression analyses. The first model contains our primary trait predictors, NT and DIS, and covariates. Only NT remained significant (HR = 1.08; $P < 0.0001$) and DIS was not significant. To further elucidate these findings, we examined lower order scales of IMP and AGG from the SNAP, as well as facets from the NEO; impulsivity (N5), self-discipline (C5), deliberation (C6) and excitement seeking (E5).

	SNAP				NEO			
	NT	DIS	IMP	AGG	N5 IMP	C5 Self-Disc	C6 Delib	E5 Excite
NT	–	0.201*	0.244*	0.435*	0.377*	–0.242*	–0.333*	0.039
DIS		–	0.766*	0.409*	0.414*	–0.426*	–0.603*	0.425*
IMP			–	0.327*	0.412*	–0.425*	–0.703*	0.323*
AGG				–	0.279*	–0.448*	–0.437*	0.242*
N5					–	–0.448*	0.432*	0.165*
C5						–	0.432*	–0.074
C6							–	–0.256*
E5								–

* $P < 0.01$.

Table 2. Correlation matrix for trait predictor variables at baseline

Variables	SA (n = 128) Mean (SD)	No SA (n = 570) Mean (SD)	Non-clinical sample Mean (SD) M/F	HR (95% CI)
SNAP NT	22.5 (5.0)	19.2 (6.5)	13.1 (7.0)/14.7 (7.0)	1.11 (1.07–1.14)**
SNAP DIS	13.2 (6.4)	11.1 (5.6)	15.6 (6.3)/12.1 (6.1)	1.07 (1.04–1.10)**
SNAP IMP	8.1 (4.2)	6.5 (3.7)	7.3 (4.1)/6.7 (4.0)	1.10 (1.06–1.15)**
SNAP AGG	8.1 (5.2)	6.5 (4.9)	6.4 (4.5)/4.1 (4.1)	1.07 (1.04–1.11)**
N5 IMP	20.7 (5.3)	19.2 (5.1)	15.8 (4.4)	1.06 (1.02–1.10)*
C5 SELF-DISC (R)	14.1 (6.3)	15.6 (6.1)	21.8 (4.3)	0.96 (0.93–0.98)*
C6 DELIB (R)	13.9 (5.3)	16.3 (5.3)	17.5 (4.1)	0.91 (0.88–0.94)**
E5 EXCITE SEEK	16.3 (4.9)	16.2 (5.2)	16.4 (4.9)	0.99 (0.96–1.03)

* $P < 0.01$; ** $P < 0.0001$

Table 3. Univariate analyses of trait predictors and comparison with non-clinical sample

Table 4. Cox PH regression analyses of prospective assessed personality traits and covariates as predictors of suicide attempts

	B	SE (B)	χ^2	P	HR	95% CI for OR
Negative temperament	0.08	0.02	18.28	<0.0001	1.08	1.04–1.12
Disinhibition	0.02	0.02	1.27	0.2602	1.02	0.99–1.05
Sex	0.40	0.22	3.18	0.07	1.49	0.96–1.05
Childhood sex abuse	–0.80	0.20	16.82	<0.0001	0.45	0.30–0.66
SUD course	0.56	0.11	24.00	<0.0001	1.75	1.40–2.19
MDD course	0.27	0.05	25.92	<0.0001	1.31	1.18–1.45
Negative temperament	0.08	0.02	16.86	<0.0001	1.08	1.04–1.12
SNAP impulsivity	0.06	0.02	6.10	0.0135	1.06	1.01–1.12
Negative temperament	0.09	0.02	19.90	<0.0001	1.09	1.05–1.14
SNAP aggression	–0.02	0.02	0.63	0.43	0.98	0.94–1.02
Negative temperament	0.08	0.02	17.45	<0.0001	1.08	1.04–1.13
NEO impulsivity (N5)	0.02	0.02	1.06	0.30	1.02	0.98–1.06
Negative temperament	0.08	0.02	18.30	<0.0001	1.08	1.05–1.13
NEO self-discipline (C5)	–0.02	0.02	1.60	0.21	0.98	0.95–1.01
Negative temperament	0.07	0.02	14.72	0.0001	1.07	1.04–1.11
NEO deliberation (C6)	–0.06	0.02	11.36	0.0007	0.94	0.91–0.97
Negative temperament	0.09	0.02	21.43	<0.0001	1.09	1.05–1.13
NEO excitement seeking (E5)	–0.02	0.02	1.05	0.31	0.98	0.94–1.02

Results of covariates remained consistent across models; thus, only statistics from the primary model with NT and DIS for covariates are listed above. Lines separate results from different models.

While IMP, AGG, N5 and C5 were all significant in univariate analyses, they were not significant in multivariate analyses with NT and covariates. SNAP IMP was marginally significant (HR = 1.06, P = 0.0135), but did not meet our Bonferroni corrected significance level of P = 0.006. However, NEO C6, corresponding to lack of planning/premeditation, was significant in the full model multivariate analyses. In each of these full models with impulsivity facet and covariates, NT and covariates of CSA, course of SUD and course of MDD remained significant.

Discussion

Our findings suggest that negative affectivity more robustly predicts future suicide attempts than disinhibition or facets of impulsivity. Furthermore, the prospective assessment of our personality traits mitigates the likelihood that our findings are because of response or attributional biases. In addition, NA remained a significant predictor of prospective suicidal behavior even after controlling for well-established risk factors such as sex, history of CSA, and course of MDD and SUD. While we expected that participants with both high NA and high DIS would be particularly vulnerable to suicide attempts, the data from the interaction analysis did not support this. Rather, participants who scored high on NA were more likely to attempt suicide regardless of their level of DIS or impulsivity. This finding is consistent with an

earlier report from this sample, which found that among BPD criteria assessed by a structured diagnostic interview (DIPD) only affective instability significantly predicted suicidal behavior over two years of follow-up; impulsivity was not significant (4).

Several researchers have advocated for facets within impulsivity, arguing that impulsivity is a heterogeneous category which includes several different traits (5, 19) and that some facets such as non-planning/lack of premeditation and disinhibited behavior are more associated with clinically relevant phenomenon such as anger and aggression than other facets such as thrill seeking (19, 20). Our results provide support for these distinctions; consistent with the aforementioned assertions, of the impulsivity facets, only lack of planning and premeditation was significantly associated with suicide attempt status while controlling for NA and covariates. Sensation-seeking was not significant even in univariate analyses. The mean score of this facet for both attempters and non-attempters are comparable with those in the general population. Other facets of impulsivity, specifically, lack of perseverance and urgency were not independently associated with suicide attempt status. Given that lack of planning/premeditation has been associated with other high risk behaviors, this particular facet of impulsivity should be targeted in behavioral treatment formulations.

How do we align our findings with those of other studies conducted with similar populations,

particularly those that have found significant associations among varieties of impulsivity and suicidal behavior? In a study of 84 patients with BPD in which trait impulsivity was assessed using three measures, the Diagnostic Interview for Borderline Patients, the Barrett Impulsivity Scale and the Self-Report Test of Impulse Control, only the last was significant in multivariate analyses for predicting past suicide attempt status (21). In a large scale study of 347 psychiatric patients which also used the Barrett Impulsivity Scale, impulsivity did not predict past suicide attempt status in univariate analyses. However, the multivariate analyses combined impulsivity with AGG; the combined factor was the only one of three factors (others being depression and psychosis) that significantly predicted suicide attempt status (22). In a prospective study of 308 patients with MDD or bipolar disorder, impulsivity combined with aggression, was again found to significantly contribute to the risk for future suicidal acts (23). Our results did not find trait aggression nor the interaction of impulsivity and aggression to significantly predict suicide attempts. However, none of these studies examined trait negative affectivity, potentially an important variable to control for as demonstrated by our results. Even so, it appears that impulsivity in a high risk sample such as psychiatric patients with BPD or similarly severe disorders is an inconsistent predictor.

It is unlikely that our findings are accounted for by differences in stability between negative affectivity and impulsivity. A report using this same sample (CLPS) found that affective instability, anger and impulsivity were the most stable BPD criteria over 2 years of follow-up (24). Furthermore, we found no differences between the suicide group and no suicide group with regard to change in impulsivity (as assessed by NEO and SNAP) over time.

Our results, and our approach of clearly delineating the trait of negative affect from disinhibition/impulsivity, suggest that trait negative affectivity warrants more attention as a vulnerability risk factor for suicide attempts, and should be considered independent of established high-risk factors when evaluating suicide risk. However, the clinical translation and implementation of these findings are clearly challenging. Because trait negative affectivity is presumed to be dispositional and therefore fairly stable, its usefulness as a predictor is limited to identifying which individuals are at high risk of making a suicide attempt, not when such individuals are at higher risk; the latter is a critical element of identifying suicide risk. Furthermore, clinical interventions targeting nega-

tive affectivity are likely to be less useful than those targeting specific symptoms or behaviors. Despite these limitations, it remains important to identify trait (or other static) predictors of suicide attempts to clarify the diathesis. It is likely that a combination of risk factors, including both static and dynamic variables, will result in more accurate predictions of risk for suicidal behavior.

The findings of this study clearly need replication in other populations. Our findings cannot be generalized to other at-risk populations excluded from our sample, such as children and adolescents, adults over the age of 50 years, and those with psychotic disorders, or those without psychiatric problems. Trait disinhibition may be particularly problematic for younger populations, who are still developing impulse control, potentially playing a larger role in suicidality (25). Our sample was limited to individuals with PD and/or MDD who were either in treatment or had a history of seeking psychiatric treatment. It can be argued that the psychiatric morbidity of our sample presents a more stringent test for identifying predictors of suicide attempts, because non-attempters in our sample are likely to be at higher risk of suicidal behaviors than the general population. However, given that only one-third of suicide victims have any mental health services within the year of suicide (26), it is important to identify and verify risk factors in a community sample. In our sample, it was not possible to ascertain whether individuals with high negative affectivity who did not meet criteria for any psychiatric disorders were also at high risk for a suicide attempt. Such information would help in guiding future assessments.

This CLPS study is prospective in design. In this particular investigation, assessments of personality traits were obtained in the interval prior to the assessment of the suicide attempt. While this adds strength our findings, we were only able to examine those who continued in the study for at least one follow-up. Furthermore, attrition is an inevitable consequence of long-term follow-up studies. Therefore, it is possible that differences between those who dropped-out after the baseline assessment and those who continued could potentially bias our findings. Specifically, we did find significant differences on SNAP AGG and DIS. However, the consistency of our results across the remaining impulsivity facets supports the validity of our overall findings.

This study examined two personality traits, negative affectivity and disinhibition, as prospective predictors of suicide attempts over 7 years of longitudinal follow-up. negative affectivity emerged as a robust significant predictor, but as

this trait underlies many psychiatric disorders (e.g. mood and anxiety disorders), further research is needed to elucidate the specific nature of the relationship between negative affectivity and suicidal behaviors. The association between disinhibition and suicide attempt status may be better accounted for by negative affectivity. This seemed to be true for most facets of impulsivity as well, with lack of planning premeditation as the exception. Our results in conjunction with the extant literature suggest the need to focus greater attention on negative affectivity, establish consensus on defining and measuring impulsivity, and further examine lack of premeditation as a predictor of suicidal behavior.

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Declaration of interest

None.

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