



# Suicide ideation and attempts among inpatient adolescents with borderline personality disorder: Frequency, intensity and age of onset

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## ABSTRACT

*Suicide ideation and attempts are a major health concern among adolescents, and recently, evidence has emerged suggesting that borderline personality disorder (BPD) may put individuals at even greater risk than depression alone. This is not surprising given that within adult samples, 8–10% of those diagnosed with BPD commit suicide. However, only a handful of studies have assessed the relation between BPD and suicide attempts among adolescents, and currently, nothing is known about the characteristics of suicide ideation among adolescents with BPD. Against this background, the aim of the present study was to examine the relation between BPD and the characteristics of suicide ideation and attempts (frequency, intensity and age of onset) in N = 106 adolescent inpatients. This question was examined using both clinician-rated and adolescent-rated measures of suicide ideation and attempts and both dimensional and categorical measures of BPD. The results of the present study indicate that adolescents with BPD experience suicide ideation earlier in life and more frequently than psychiatric controls. Notably, the groups did not differ with regard to adolescent-rated intensity of suicide ideation nor frequency, intent to die or age of onset of suicide attempts. A number of possible explanations for the absence of these group differences are presented. Copyright © 2012 John Wiley & Sons, Ltd.*

Suicide ideation and suicide attempts are currently a major health concern within the adolescent population (Goldsmith, Pellmar, Kleinman, & Bunney, 2002). Completed suicide attempts are estimated to be the third leading cause of death among those between 10 and 24 years of age and thus typically receive a great deal of attention (Xu, Kochanek, Murphy, & Tejada-Vera, 2010). Furthermore, it is estimated that approximately 100 non-fatal attempts take place for every completed adolescent suicide (Gould, Greenberg, Velting, & Shaffer, 2003), further highlighting the magnitude of this problem. Additionally, suicide carries a large societal cost given its detrimental emotional impact

on friends and family members (Crosby & Sacks, 2002) and the cost associated with lost lives.

While the rates of suicide attempts among adolescents obviously warrant concern, suicidal ideation is also of great importance because of the personal distress that frequently accompanies ideation and its relation to suicide attempts. Suicide ideation, prevalent among both clinical and non-clinical samples, is the first step towards completed suicide (Kachur, Potter, Powell, & Rosenberg, 1995). Furthermore, recent evidence suggests that suicidal ideation in adolescence puts individuals at risk for more extreme suicide-related behaviours, such as suicide attempts, later on (Fergusson et al., 2005;

Langhinrichsen-Rohling & Lamis, 2008). Additionally, suicide ideation in adolescence increases the likelihood of pathology in adulthood (Fergusson et al., 2005). In one study, those who endorsed suicide ideation in adolescence were twice as likely to meet criteria for an Axis I disorder at age 30, 12 times more likely to have attempted suicide, had poorer overall functioning and reported more problem behaviors than those who did not endorse suicide ideation in adolescence (Reinherz, Tanner, Berger, Beardslee, & Fitzmaurice, 2006). Therefore, suicide ideation in adolescents is an important area of study particularly because understanding factors that predispose individuals to suicidal ideation may facilitate suicide attempt prevention efforts.

Existing research has already successfully identified a number of predictors of suicide attempts aside from suicide ideation. Among them, psychiatric diagnosis has been heavily emphasized given that 90% of adolescents who commit suicide have a psychiatric diagnosis (Bridge, Goldstein, & Brent, 2006). The presence of major depressive disorder (MDD) is thought to be the most salient diagnostic indicator of suicide attempts in youth (e.g. Kovacs, Goldston, & Gatsonis, 1993). More recently, however, evidence has emerged suggesting that the presence of borderline personality disorder (BPD) features may put individuals at even greater risk for suicide than depression alone (Yen et al., 2003). This is not surprising in light of the fact that within adult samples, 8–10% of those diagnosed with BPD commit suicide (Pompili, Girardi, Ruberto, & Tatarelli, 2005). While only one study (Sharp, Green, Venta, Pettit, & Zanarini, in press), to our knowledge, has explored the incremental role of BPD above and beyond MDD in adolescent suicide, the prevalence of increased non-suicidal self-injury (NSSI) and suicide attempts among adolescents with BPD is well established (Jacobson, Muehlenkamp, Miller, & Turner, 2008; Muehlenkamp, Ertelt, Miller, & Claes, 2011; You, Leung, Shatin, Fu, & Lai, 2011). Furthermore, Horesh, Orbach, Gothelf, Efrati and Apter (2003) have demonstrated that suicide attempts among adolescents with BPD are different (with regard to the role of anger and aggression) than suicide

attempts among adolescents with MDD, suggesting that suicide in BPD is perhaps relatively unique and merits targeted research. By and large, these findings suggest that BPD now deserves as much attention as MDD has traditionally had in the suicide literature.

The lack of studies examining suicide ideation and attempts as a function of BPD traits may be due to lingering controversy surrounding the validity of a BPD diagnosis in youth. Some researchers contend that BPD symptoms in younger samples may be indicative of normal developmental trajectories rather than pathology (Garnet, Levy, Mattanah, Edell, & McGlashan, 1994; Golombek, Marton, Stein, & Korenblum, 1986; Meijer, Goedhart, & Treffers, 1998). However, research emerging over the last decade suggests that BPD can be reliably assessed and diagnosed in this group (Becker, McGlashan, & Grilo, 2006; Bondurant, Greenfield, & Tse, 2004; Chang, Sharp, & Ha, 2011; Grilo, Becker, Walker, Edell, & McGlashan, 1996; Mattanah, Becker, Levy, Edell, & McGlashan, 1995; Sharp, Ha, Michonski, Venta, & Carbone, in press; Sharp, Mosko, Chang, & Ha, 2011) and that diagnosis in adolescence is stable across time (Bernstein et al., 1993; Crawford, Cohen, & Brook, 2001). Moreover, estimates within clinical samples indicate that around 11% of adolescents meet the criteria for BPD (Chanen et al., 2004), with 23% (Sharp et al., 2011) to 49% (Grilo, Becker, Fehon et al., 1996) of adolescents meeting the criteria for BPD in inpatient facilities, suggesting that it is highly prevalent within this age group and therefore an important factor to consider when measuring suicide risk.

Ultimately, the relation between BPD and suicide attempts and ideation in adolescence is an essential area of study because expanding existing risk identification and management strategies will enhance our ability to target those at risk in treatment and improve prevention efforts. While it is well established that BPD is closely tied to suicide attempts in adolescents (Jacobson et al., 2008; Muehlenkamp et al., 2011), no study, to our knowledge, has explored how the frequency, intensity and age of onset of suicide ideation differ

between adolescents with and without BPD. Although research regarding suicide ideation among adolescents with BPD is particularly lacking, it is also important for this research to evolve alongside studies exploring suicide attempts among adolescents with BPD in order to provide relevant context for an exploration of suicide ideation in this group. At this time, only four other studies (Greenfield et al., 2008; Rathus & Miller, 2002; Sharp, Green et al., in press; Sharp, Ha et al., in press) have assessed suicide ideation in adolescents with BPD, and none sought to or performed analyses exploring differences in the specific characteristics (frequency, intensity and age of onset) of suicide ideation between these two groups. Against this background, the aim of the present study was to compare adolescent inpatients with and without BPD with regard to suicide ideation and suicide attempts. While NSSI is also an important aspect of suicidality in adolescents with BPD, a great deal of research already exists on the subject (e.g. Jacobson et al., 2008; Muehlenkamp et al., 2011), and therefore self-injury was not included in the present study. This is, to our knowledge, the first study to explore how the frequency, intensity and age of onset of suicide ideation and suicide attempt differ by BPD status while controlling for depressive symptoms, acknowledging that depression is commonly viewed as the strongest psychopathological correlate of suicide. Furthermore, we sought to explore how these same outcomes were related to a dimensional measure of borderline features in order to explore the main study variables from both categorical and dimensional perspectives.

## Methods

### *Participants*

The study was approved by the appropriate institutional review board. A total of 179 consecutive admissions to the 16-bed adolescent unit of a county psychiatric hospital were approached for consent on the day of admission. The unit is an acute psychiatric unit that serves the indigent

population of a large metropolitan area in the United States. At admission, parents were given the opportunity to consent in English or Spanish, and following parent consent, adolescents were approached for assent. Because the study procedures required English fluency, adolescents could only consent in English. Of those approached, 9 declined, 40 were discharged prior to completion of the assessments (given the acute nature of most admissions to the unit), 3 began assessments and then revoked consent and 19 were excluded from the study. The inclusion criteria adopted were English fluency, voluntary admission to the hospital, age between 12 and 17 years and capacity to participate in research (dictated by the attending psychiatrist; adolescents with severe psychosis, mental retardation and those who posed a physical danger to research assistants were not determined to have adequate capacity). Therefore, the sample was reduced to 108 adolescents. Missing data for two participants was sufficient to necessitate that they be excluded from all analyses, resulting in a sample of 106 adolescents with complete data.

All assessments were conducted in private on the unit by doctoral psychology students. Assessments were conducted within two days of admission, and participants were awarded a \$30 gift card to a nationwide department store for their participation in the study. The average length of stay on the adolescent unit is 7 days.

The final sample consisted of  $N = 106$  adolescents. Of the sample 65.1% ( $n = 69$ ), was female, and the average age was 14.63 years ( $SD = 1.40$ ). The sample was ethnically diverse, and the breakdown was as follows: 38.7% Hispanic, 32.1% African American, 25.5% White, 2.8% Multiracial and 0.9% who identified as "Other."

### *Measures*

*Borderline personality disorder.* The CI-BPD (Zanarini, 2003) is a semi-structured interview that assesses DSM-IV BPD in children and adolescents and, in this study, was used to create a variable reflecting BPD diagnostic status. It was adapted for

use in children and adolescents from the Diagnostic Interview for DSM-IV Personality Disorders. After asking a series of corresponding questions, the interviewer rates each DSM-based criterion with a score of 0 (absent), 1 (probably present) or 2 (definitely present). In general, to meet diagnostic criteria for BPD, the adolescent must meet five out of nine criteria at the 2-level. However, in order to avoid a potential confound between the independent (BPD) and dependent variables (suicide-related behaviours) in the present study, the self-harm/suicide criterion of the CI-BPD was excluded from analyses following the procedure employed by Sharp, Green et al. (in press), and thus, an adolescent met the diagnostic criteria when five out of eight criteria were met at the 2-level. The CI-BPD has demonstrated adequate inter-rater reliability (Zanarini, 2003) and excellent psychometric properties in a recent validity study among inpatient youth (Sharp, Ha et al., in press). Interviewers in the present study (doctoral level psychology students) were trained on this measure by the study's principle investigator (Carla Sharp, Ph.D.) by first observing senior students performing the interview several times and then being observed while giving the interview themselves. While inter-rater reliability information was not collected (because of privacy regulations at the hospital preventing audio recording of interviews), consensus meetings utilizing recorded interviews from Sharp, Ha et al. (in press) were used for biweekly validity checks. Internal consistency in the present sample was adequate with a Cronbach's alpha of 0.70.

The Borderline Personality Features Scale for Children (BPFSC; Crick, Murray-Close, & Woods, 2005), a 24-item self-report measure, was used to assess borderline features from a dimensional perspective. The measure was adapted from the borderline subscale of the Personality Assessment Inventory and is appropriate for the assessment of borderline personality features in children ages nine and older, including adolescents (Chang et al., 2011). Responses are scored on a 5-point Likert scale, ranging from 1 (not at all true) to 5 (always

true) with total scores indicating more borderline features. The BPFSC has been identified as a useful tool in assessing borderline pathology in adolescents (Chang et al., 2011). In the present sample, internal consistency of this measure was good with a Cronbach's alpha of 0.82.

*DSM depressive symptoms.* DSM depressive symptoms were assessed continuously using the Youth Self Report (YSR; Achenbach & Rescorla, 2001), a self-report-based questionnaire for use with adolescents between the ages of 12 and 18 years. The measure contains 112 problem items, each scored on a 3-point scale (0 = not true, 1 = somewhat or sometimes true or 2 = very or often true) and yields a number of scales. In this study, the DSM-Oriented Affective Problems scale was used. It was of particular importance to assess and control for depressive symptoms in this study, given research suggesting that depressive symptoms are closely tied to suicide in adolescents and in light of the fact that the aim of the present study was to identify relations with suicide ideation and attempts unique to BPD. Internal consistency of the Affective Problems subscale of the YRS in the present sample was good with a Chronbach's alpha of 0.95.

*Self-injurious thoughts and behaviours.* The Self-injurious Thoughts and Behaviours Interview (SITBI; Nock, Holmberg, Photos, & Michel, 2007) was administered to adolescents, in private, by graduate research assistants in order to assess many features of various self-injurious thoughts and behaviours. The interview consists of modules assessing a variety of thoughts and behaviour, but given that suicide ideation and suicide attempts were the exclusive focus of the present study, only those modules were included in this study. These were used to create a number of variables reflecting frequency, age of onset and intensity of suicide ideation and attempts. For each module, a continuous variable reflecting lifetime frequency was created by asking the participant to estimate the number of times that they have engaged in suicide ideation

and attempts. Following the procedure used by Nock and Mendes (2008) and Nock, Prinstein, and Sterba (2009), the frequency of each behaviour was capped at 500 to limit the effect of extreme outliers on data analyses. An age of onset variable was created by asking the participant the age at which they first engaged in suicide ideation and attempts. A continuous variable assessing average intensity (only for suicide ideation) was also created by asking the individual for a rating between 0 (low/little) and 4 (very much/severe). Individuals who had not engaged in the behaviour were excluded from analyses with regard to age of onset and intensity. Previously, the SITBI has shown good inter-rater reliability ( $\kappa = 0.99$ ), test-retest reliability over 6 months ( $\kappa = 0.70$ ) and strong agreement with other measures of suicide ideation, attempt and NSSI (Nock et al., 2007).

The Modified Scale for Suicide Ideation (MSSI; Miller, Norman, Bishop, & Dow, 1986) was also used to continuously assess suicide ideation but is an interview-based measure and therefore reflects clinical judgement regarding the intensity of suicide ideation. The measure is composed of 18 items rated from 0 to 3 for a total score ranging from 0 to 54 with higher scores indicating greater suicide ideation. Its reliability and validity for use with adolescents have been supported in the past (Pettit et al., 2009), and internal reliability in the present sample was good with a Cronbach's alpha of 0.92.

The Suicide Intent Scale (SIS; Beck, Schuyler, & Herman, 1974) is an interview-based measure of the intent to die associated with a suicide attempt. It consists of 15 items, which the interviewer rates on a scale from 0 to 2 for a total score between 0 and 30, with higher scores indicating greater intent to die. In the present study, every previous suicide attempt described by the adolescent was assessed with the SIS. The total score for each attempt was then summed to give a continuous variable of suicide intent that takes into account both the number and seriousness of previous attempts. Previous research has confirmed the reliability and validity of this measure (Goldston, 2000 as cited by Pettit et al., 2009).

Training on all three of these measures included observing the interviews being delivered by senior doctoral psychology students and then being observed by the principle investigator (Carla Sharp, Ph.D.) delivering the interview. Periodic site visits by the principle investigator were conducted in order to curtail deviations from protocol. Because of the aforementioned privacy regulations of the hospital, interviews were not recorded, and therefore inter-rater reliability was not assessed. In all instances, interviewers were blind to the diagnostic status of the adolescent being assessed.

## Results

Before carrying out bivariate analyses, we removed the item assessing suicide attempts and self-harm from the CI-BPD. This was carried out to avoid confounding the independent and dependent variables and resulted in a reduced total of eight criteria. The modal and median number of criteria endorsed were 1 and 2 respectively. A total of 14 adolescents, 13.2% of the total sample, met diagnostic criteria for BPD. Because only four males met criteria for BPD, Pearson chi-square analyses were not appropriate for determining the relation between sex and BPD status. However, the number of CI-BPD criteria endorsed at the 2-level did not differ significantly by sex ( $t = -0.305$ ,  $p = 0.761$ ), and therefore sex was not controlled for in subsequent analyses. Furthermore, age did not differ with regard to BPD status ( $t = -0.442$ ,  $p = 0.659$ ) and was not controlled for in subsequent analyses (except with regard to age of onset in which age at interview is obviously relevant). The presence of suicide ideation and attempts in the total sample and by BPD status was evaluated in order to reveal relevant sample sizes for all variables of interest, and results are presented in Table 1. For each variable, outlier analyses were conducted, and responses that were more than 1.5 standard deviations away from the mean were excluded from analyses. In all, seven outliers were identified for the SITBI lifetime suicidal ideation variable, four outliers for the

Table 1: Presence of various self-injurious thoughts and behaviours in the total sample and by BPD status

	Total sample (n = 106)	Non-BPD group (n = 92)	BPD group (n = 14)
Previous suicide ideation	82.1% (n = 87)	80.4% (n = 74)	92.9% (n = 13)
Age of onset (SITBI)	M = 12.66 SD = 2.33	M = 12.94 SD = 2.17**	M = 11.08 SD = 2.66**
Lifetime frequency (SITBI)	M = 53.12 SD = 127.77	M = 24.84 SD = 61.24**	M = 258.17 SD = 52.83**
Average intensity (SITBI)	M = 2.25 SD = 1.07	M = 2.14 SD = 1.05*	M = 2.88 SD = 1.00*
Interviewer intensity (MSSI)	M = 18.10 SD = 13.36	M = 16.32 SD = 12.52**	M = 29.71 SD = 13.22**
Previous suicide attempt	50.9% (n = 54)	46.7% (n = 43)	78.6% (n = 11)
Age of onset (SITBI)	M = 14.02 SD = 1.70	M = 14.19 SD = 1.64	M = 13.36 SD = 1.86
Lifetime frequency (SITBI)	M = 0.83 SD = 1.14	M = 0.71 SD = 0.94	M = 1.75 SD = 1.91
Intent to die (SIS)	M = 11.68 SD = 15.85	M = 10.08 SD = 14.02	M = 23.00 SD = 22.96

Note: BPD, borderline personality disorder; MSSI, Modified Scale for Suicide Ideation; SIS, Suicide Intent Scale; SITBI, Self-injurious Thoughts and Behaviours Interview. \* $p < 0.05$ , \*\* $p < 0.01$ .

SITBI lifetime suicide attempt variable and one outlier for the SIS intent to die variable.

#### *Relation between BPD diagnosis and age of onset, lifetime frequency and average intensity of suicide ideation*

First, independent sample  $t$ -tests were used to compare the BPD and non-BPD groups with regard to age of onset, lifetime frequency and average intensity of suicide ideation as measured in the SITBI. These analyses revealed significant group differences for age of onset ( $t = 2.76$ ,  $p = 0.007$ ), lifetime frequency ( $t = -3.18$ ,  $p = 0.009$ ) and average intensity of suicide ideation ( $t = -2.40$ ,  $p = 0.025$ ). These significant relations were each followed up separately using a series of linear regression analyses. In the first, BPD status, depression (YSR Affective Problems) and current age were entered as predictor variables, and age of onset of suicide ideation served as the outcome variable. Even when controlling for age at interview and depression, BPD status remained significantly related to age of onset of suicide ideation ( $B = -1.66$ ,  $SE = 0.71$ ,  $\beta = -0.25$ ,  $t = -2.34$ ,  $p = 0.022$ ), and together, BPD, depression and age accounted for 22.8% of the variance in the age of onset of suicide ideation (adjusted  $R^2 = 0.228$ ,  $R^2 = 0.257$ ,  $R = 0.507$ ). In the second linear regression, BPD status and depression served as predictor variables, and lifetime frequency of suicide ideation

served as the outcome variable in order to assess the significant bivariate relation while controlling for depression. Borderline diagnosis remained significantly associated with frequency of suicide ideation ( $B = 166.94$ ,  $SE = 33.54$ ,  $\beta = 0.441$ ,  $t = 4.977$ ,  $p < 0.001$ ), and together, BPD and depression accounted for 37.8% of the variance in the frequency of suicide ideation (adjusted  $R^2 = 0.378$ ,  $R^2 = 0.392$ ,  $R = 0.626$ ). Finally, in the third linear regression, BPD status and depression (YSR Affective Problems) were entered as predictor variables with average intensity of suicide ideation as the outcome variable, but the significant relation between BPD and average intensity identified at the bivariate level lost significance.

Next, the BPD and non-BPD groups were compared by using a continuous measure of suicide ideation intensity (MSSI). Interviewer-rated suicide ideation was significantly higher in the BPD group than in the non-BPD group ( $t = -3.70$ ,  $p < 0.001$ ). When this relation was explored at the multivariate level using suicide ideation as the outcome in a linear regression in which BPD status and depression were entered as predictor variables, BPD diagnosis retained significance ( $B = 10.89$ ,  $SE = 3.81$ ,  $\beta = 0.328$ ,  $t = 2.86$ ,  $p = 0.005$ ), and together, both variables accounted for 7.9% of the variance in suicide ideation (adjusted  $R^2 = 0.079$ ,  $R^2 = 0.10$ ,  $R = 0.31$ ).

*Relation between BPD diagnosis and age of onset, severity and lifetime frequency of suicide attempts*

Again, independent sample *t*-tests were used to compare the BPD and non-BPD groups with regard to age of onset and lifetime frequency of suicide attempts as measured by the SITBI but did not reveal significant group differences with regard to either variable. Similarly, when the BPD and non-BPD groups were compared on the interviewer-rated SIS variable assessing total intent to die across all attempts, no significant group differences were noted.

*Relation between borderline features and suicide ideation and attempts*

Given the low number of adolescents who met diagnostic criteria for BPD in the present sample, a dimensional measure of borderline features was also used to bolster findings using the categorical measure and, furthermore, explore the relation between borderline features and suicide ideation and attempts. To that end, Pearson's correlations were computed between all main study variables, and the results are presented in Table 2. Results largely replicated the relations identified with a categorical measure of BPD, namely that borderline features are associated with the frequency of suicide ideation on the SITBI and intensity of

interview-rated suicide ideation (MSSI) but not frequency of suicide attempts. The mean score on the BPFSC in the present sample was 45.94 (*SD* = 13.34).

## Discussion

The present study adds to a growing literature exploring suicide ideation and attempts among adolescents with BPD and, notably, is the first study to explore specific characteristics of suicide ideation in this population. Overall, the current findings suggest that adolescents with BPD differ from those without BPD with regard to age of onset and lifetime frequency of suicide ideation. These findings are strengthened by the fact that these relations remained significant when depression was controlled for, adding to the growing consensus that BPD deserves a great deal of both academic and clinical consideration as a psychopathological risk factor for suicide. Similarly, when BPD was explored from a dimensional perspective, using instead a continuous measure of borderline features, correlations revealed significant relations between borderline features, suicide ideation frequency and intensity, and suicide attempt intent to die.

While this is the first study to explore differences in the characteristics of suicide ideation between

Table 2: Correlations between borderline features and self-injurious thoughts and behaviours

	BPFSC	Ideation age	Ideation freq.	Ideation intensity	Ideation intensity <sup>a</sup>	Attempt age	Attempt freq.	Attempt intent <sup>a</sup>
BPFSC	1	—	—	—	—	—	—	—
Ideation age of onset	-0.15	1	—	—	—	—	—	—
Ideation frequency	0.34**	-0.44**	1	—	—	—	—	—
Ideation avg intensity	0.15	-0.01	0.31**	1	—	—	—	—
Ideation intensity <sup>a</sup>	0.41***	-0.34**	0.59***	0.41***	1	—	—	—
Attempt age of onset	-0.12	0.69***	-0.26	0.06	-0.26	1	—	—
Attempt frequency	0.16	-0.28**	0.32**	0.15	0.30**	-0.47***	1	—
Attempt intent to die <sup>a</sup>	0.25*	-0.16	0.56***	0.40***	0.68***	-0.42**	0.52***	1

BPFSC, Borderline Personality Features Scale for Children. <sup>a</sup>Interviewer rated. \**p* < 0.05, \*\**p* < 0.01, \*\*\**p* < 0.001.

adolescents with and without BPD, existing research in adults with BPD (e.g. Berk, Jeglic, Brown, Henriques, & Beck, 2007; Zisook, Goff, Sledge, & Shuchter, 1994) reinforces the findings of the present study. Interestingly, though, the self-reported intensity of suicide ideation did not differ between groups after controlling for depression in this sample, implying that it may be the chronicity, rather than intensity, of suicide ideation that characterizes the BPD group. Furthermore, these findings suggest that the experience of suicide ideation is unique among adolescents with BPD such that they experience suicide ideation earlier in life and with greater frequency than non-BPD inpatients. Adolescents with BPD, however, did differ from their non-BPD counterparts with regard to interviewer-rated suicide ideation intensity, suggesting that perhaps adolescents with BPD undervalue the clinical significance of their suicide ideation or, alternatively, that non-BPD adolescents overvalue the clinical significance of their suicide ideation. Further research, however, is needed in order to replicate these seemingly contradictory findings and understand how different aspects and assessment of suicide ideation differentially impact the related suicide risk.

The fact that adolescents with BPD did not differ from their psychiatric counterparts with regard to suicide attempts (i.e. age of onset, intent to die or frequency) stands in contrast to existing research (Jacobson et al., 2008; Muehlenkamp et al., 2011), which ties borderline symptoms to suicide attempts. One explanation for this finding is that the sample in the present study deviates from prior work exploring adolescents recruited from outpatient samples. Certainly, the rate of suicide attempts is much higher in the inpatient population than it is in community or outpatient samples, and therefore it is likely that the psychiatric comparison group used in the present sample was not optimal to demonstrate group differences in suicide attempts. Furthermore, the use of an inpatient comparison group suggests that the findings of this study should be generalized to other populations with caution. Indeed, inpatients are a

highly specific group in which the rates of psychopathology, suicide ideation and suicide attempts are likely to be greater than among community adolescents, making this comparison relatively narrow and limiting the generalizability of findings to psychiatric outpatients or non-clinical populations. This study limitation is further compounded by the fact that the number of adolescents meeting criteria for BPD in the current study was very low (14 out of 106). While results were confirmed through dimensional, trait-level analyses that utilized the complete sample, it would be very important to replicate these findings in a larger sample of adolescents meeting criteria for BPD.

Another explanation for the absence of group differences in number of suicide attempts is informed by research on adults with BPD, which suggests that those who make suicide attempts are a distinct subgroup that differs from those that are commonly assessed in psychiatric settings. Specifically, McGirr, Paris, Lesage, Renaud, and Turkecki (2009), in a comparison of adults with BPD who had died by suicide and those who had not, found that a variety of factors differentiated the two groups. Most notably, suicide attempts were associated with greater impulsivity and aggression, implying that subtypes within BPD may account for differences in the rate of suicide attempt and completion. Furthermore, recent research (McGirr et al., 2009) also suggests that the disorder's diagnostic criteria are differentially associated with suicide attempts, such that it is possible for an individual to meet criteria for the diagnosis without endorsing the criteria that are most closely tied to suicide attempts. Although this level of analyses was outside of the scope of the present study, it may account for the absence of group differences in the frequency of suicide attempts and is an important area for future research. Extending the notion of subtypes to adolescents, Miller and colleagues (Miller, Muehlenkamp, & Jacobson, 2008; Miller, Neft, & Golombek, 2008) suggested in their reviews of adolescent BPD, that there is a subgroup of adolescent BPD patients for whom the disorder is stable and reliable but a second subgroup for whom



BPD traits will resolve. While our data cannot speak to this point, it is possible that early onset of suicidal behaviours and higher frequency and intensity of such behaviours may indicate a more stable BPD subgroup. Only longitudinal studies can shed light on this probable notion.

Whatever the reason for the lack of relation between BPD status and suicide attempts, the findings of the current study are consistent with the findings of another study that demonstrated no relation between BPD status and suicide attempts in inpatient adolescents (Sharp, Green et al., *in press*). Sharp, Green et al. (*in press*) recruited patients at a private medium-stay, high socioeconomic status adolescent unit and found that BPD status was related to suicide ideation but not suicide attempts. If this finding is consistently replicated, it might, in the context of the consistent findings that link suicide attempts with BPD status in adults, suggest that a developmental process is at play. Youth with emerging BPD may start-off in adolescence with suicidal ideation (as demonstrated in this study) and self-harm, which, in time, may build momentum and solidify into a clearer pattern of suicide attempts (Sharp, Green, et al., *in press*).

While these findings add to the current view of suicide ideation and attempts among adolescents with BPD, they are tempered by several limitations of note. Specifically, the present study relied on a relatively small sample of adolescents with BPD ( $n = 14$ ) and therefore lacked sufficient power to explore differences within the BPD group. For instance, the present sample is not sufficiently large to explore the possibility of different subtypes of BPD and their relation to suicide ideation and suicide attempts, although this remains a valuable avenue for future research. Furthermore, the present study is limited by its cross-sectional design, which mandates the assessment of suicide ideation and attempts in the past and is subject to the flaws of retrospective report. Specifically, the estimates for frequency, intensity and age of onset for each behaviour often spanned a large amount of time

and were therefore subject to estimation in self-report and memory biases. Similarly, the cross-sectional design of this study prevents us from drawing any conclusions about the developmental pattern of suicide ideation and attempts in adolescents, a highly important area for future research given the enormous clinical utility of identifying a suicidal trajectory early on. Another limitation relates to the fact that the link between BPD and suicide ideation and attempts in adolescents may be accounted for by the overlap between the behavioural and psychological aspects of BPD and other correlates of suicide ideation and attempts, not measured in the current study. For example, alcohol and drug use is associated with both suicide (Borges, Angst, Nock, Ruscio, & Kessler, 2008; Crumley, 1990; Gould et al., 2003; Levy & Deykin, 1989) and BPD (Carballo, Bird et al., 2007; Carballo, Oquendo, Giner, & Sher, 2007) among adolescents, and furthermore, adolescents with comorbid BPD and substance use disorders are at increased risk of suicide (Wilson, Fertuck, Kwitel, Stanley, & Stanley, 2006). Additionally, a diagnostic criterion for BPD, impulsivity, is often noted as an important risk factor for suicide ideation and attempts (Wilson et al., 2006), suggesting that the two are fundamentally tied. This may be especially important to examine in adolescent BPD samples because this trait tends to decline in adulthood (Stevenson, Meares, & Comerford, 2003). Suicide ideation and attempts in adolescents have also been linked with emotion dysregulation (Perez, Venta, Garnaat, & Sharp, *in press*), which has proved to be an important aspect of BPD in adolescents as well (Ebner-Priemer et al., 2007). Further research needs to examine the aforementioned variables as possible moderators and mediators in the relation between BPD and suicide ideation and attempts. Also, given the age of the sample, the present study would have been strengthened by the inclusion of a parent-report measure of the adolescent's BPD symptoms in order to provide a more cohesive picture. The absence of multiple sources of report is a limitation of this study.

Notwithstanding the aforementioned limitations, the present study is strengthened by previously validated, interview-based and self-report-based measures of both BPD and suicide ideation and attempts, an ethnically and racially diverse sample, and aims that have not previously been explored in an adolescent sample. Furthermore, BPD was assessed from categorical, dimensional, interviewer-based and self-report-based points of view. For these reasons, the present study makes a valuable contribution to existing research on suicide ideation and attempts, notably suicide ideation, among adolescents with BPD while also identifying significant gaps in knowledge appropriate for future research.

### Ethical Statement

The research was supported by the Child and Family Program of the Menninger Clinic. The views within represent the views of the authors and not any other institution. We would like to thank the adolescents and their families who participated in the research.

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