Impairment in personality functioning predicts young adult suicidal ideation and suicide attempt above and beyond depressive symptoms

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ABSTRACT

Interpersonal factors and depression are believed to be some of the main drivers of suicidal thoughts and behaviors, but other factors may be equally or more important. Drawing on psychodynamic (mentalization) theory, we propose that personality functioning, in particular an incoherent sense of self, may be an important driver of suicidal thoughts and behaviors over and above factors of interpersonal functioning and depression. To evaluate this, we examined associations between personality functioning and suicidal ideation and suicide attempt in young adults. Participants (N=153; M_{age}=20.93) were recruited from a college sample (N=90) and a clinical sample with borderline personality disorder (N=63). Personality functioning (self and interpersonal components) was measured with the Level of Personality Functioning Scale - Brief Form 2.0. Suicidal ideation was measured with the Personality Assessment Inventory. Suicide attempt history was assessed with the Columbia-Suicide Severity Rating Scale. Depression symptoms were measured with the Symptom Checklist 90. Regressions examined relationships between personality functioning, depression symptoms, and suicidal ideation or attempt while controlling for age and gender. Overall personality functioning was significantly associated with suicidal ideation (β=.584, p<.001) and suicide attempt (β=.384, p<.001). Overall personality functioning was a stronger predictor than depression symptoms, age, and gender when included in the same model predicting suicidal ideation or attempt. Both the self and interpersonal components of personality functioning were significantly associated with suicidal ideation and attempt, with larger effect sizes for self-functioning. Findings underscore the importance of considering personality functioning, especially self-functioning, in suicide risk assessment and treatment.

Key words: suicide, level of personality functioning, borderline personality disorder, identity disturbance, depression.

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Introduction

Suicide is a leading cause of death among youth and young adults, and it is estimated that age-adjusted suicide rates increased by approximately 36% between 2000 and 2021 in the United States (Ballesteros *et al.*, 2024; Trinh *et al.*, 2024). Although suicidal thoughts and behaviors (STBs) are recognized as a public health concern (Trinh *et al.*, 2024), and a proliferation of suicide research has ensued in recent decades (Nock, 2016), rates continue to rise and our ability to predict STBs remains significantly limited (Franklin *et al.*, 2017). Thus, there is an urgent need to improve methods of risk detection, prevention, and intervention. While several theories for suicide exist (see Díaz-Oliván *et al.*, 2021 for review), the interpersonal theory of suicide has garnered particular attention over recent years (Chu *et al.*, 2017).

The interpersonal theory of suicide (IPTS), first articulated by Joiner (2007) and later elaborated by Van Orden *et al.* (2010), proposes that perceived burdensomeness (*i.e.*, mistaken assump-

tion that one is a burden to others) and thwarted belongingness (*i.e*., feelings of loneliness, social disconnect) combine to form suicidal ideation. According to the IPTS, those who attempt suicide are differentiated from those with suicidal ideation who do not attempt by acquired capability, or a desensitized view of death and increase in pain tolerance resulting from recurrent experiences of painful and provocative events. While Chu *et al.* (2017) conclude their meta-analytic review with support for the IPTS, effect sizes were small (average effect size<.2) for the interaction between the two negative interpersonal cognitions (*i.e.*, perceived burdensomeness, thwarted belongingness) in predicting suicidal ideation. Similarly, Ma *et al.*'s (2016) systematic review found inconsistent results for the interactions between perceived burdensomeness and thwarted belongingness in predicting suicidal ideation. Moreover, a meta-analysis conducted by Franklin and colleagues (2017) found that, despite notable increases in suicide research over the past 50 years, science's ability to predict STBs is essentially equivalent to random guessing. Considering the continuously rising rates of suicide and seemingly marginal strides in suicide research over recent decades, it is likely that important factors that contribute to the development of STBs are absent from the IPTS. Notably, the IPTS does not include how an individual develops the negative interpersonal cognitions of perceived burdensomeness and thwarted belongingness. Thus, perhaps the identification of more distal risk factors that contribute to the development of these negative interpersonal cognitions is needed to advance methods of prevention and intervention.

While the IPTS elaborates a framework for understanding the role of interpersonal processes in the development of suicidality, consideration of *intra*personal processes, or personality functioning, involved in suicidal behaviors has received less attention. With personality functioning, we refer directly to the construct as defined in the contemporary psychiatric nosology of personality disorder as represented by the Alternative Model of Personality Disorder (AMPD) in the DSM-5 (American Psychiatric Association, 2013). Specifically, the AMPD defines Level of Personality Functioning (LPF) as an intrapsychic capacity humans have to manage representations of self and others in the context of important relationships. LPF includes both self-functioning (identity and self-direction) and interpersonal functioning (empathy and intimacy). An optimally functioning personality is described as one in which an individual has a coherent sense of self, strong reflective capacities, differentiated emotional life, self-directedness, the capacity to empathically reflect and integrate the perspective of others, and strong and mutually rewarding relationships. In the AMPD, self and interpersonal functioning are viewed as inextricably linked in the LPF construct, and we suggest this to also be the case for an outcome like suicidal behaviors.

Given the foundational role of adaptive self-function for successful interpersonal relationships (Rosen, 2016) and positive psychological outcomes (Bogaerts *et al.*, 2023; La Guardia, 2009; Van Doeselaar *et al.*, 2018), we propose that maladaptive self-function may serve as a catalyst for the development of negative interpersonal cognitions and, thus, the development of suicidal desire. Without resolution, maladaptive self-function will maintain negative interpersonal beliefs and coupled with distorted and negative views of the self, lead to STBs. Thus, perhaps maladaptive self-functioning (*i.e.,* identity disturbance, low self-esteem, poor self-reflection, emotion dysregulation) initially serves as a more distal risk factor for the development of STBs, such that distorted self-narratives serve as a breeding ground for the development of negative interpersonal cognitions (*i.e.*, perceived burdensomeness, thwarted belongingness). Importantly, self- and interpersonal-functioning are intertwined and interact dynamically. Thus, distorted self-narratives and negative interpersonal cognitions likely interact to generate a reinforcing cycle of social isolation and self-hate, resulting in STBs. In support of this notion, we briefly review mentalization based theory to illustrate the development of self and the role of mentalization in binding personality and briefly review the literature demonstrating the salience of self-function in STBs.

Mentalization-based theory (Fonagy *et al.*, 2002) proposes that an incoherent sense of self results from limitations in one's we are explaining that mentalization is the ability to understand the behavior of self and other in terms of mental states (Bateman & Fonagy, 2016). According to this theory, mentalizing is key for a broad, elaborate understanding of the self (Fonagy & Target, 1998), and is also important for the development of close relationships (Fonagy *et al.*, 2002). Mentalizing capacities are believed to develop through marked mirroring (*i.e.*, a caregiver reflecting the child's emotional state back to them in a digested form), which assists the child in developing an understanding of their own mental states, later evolving into an understanding of the self. Thus, the self is built over time and heavily guided by the information reflected back by others within the interpersonal environment. The mentalizing framework argues that ongoing inaccurate reflections of a child's affect by their caregiver during development leave the child feeling confused and invalidated about their own mental states. Over time, this ongoing inaccurate mirroring and resulting confusion about mental states results in an incoherent representation of one's experience and personality, that is, one's sense of self (Bateman & Fonagy, 2016).

A key concept associated with mentalizing is epistemic trust, which concerns one's ability to accurately assess the validity and relevance of social feedback (Parolin *et al.*, 2024). Epistemic trust boosts social learning and allows for the acquisition of self-knowledge from external feedback, and can, therefore, buffer against negative self-narratives. For instance, if an individual views themselves as bad and failing at everything and does not trust the interpersonal feedback that contradicts this maladaptive self-narrative, they will continue to feel misunderstood and isolated (see Fonagy *et al.* (2022) for elaboration). Epistemic mistrust also undermines knowledge of the self, increasing uncertainty and confusion in the self-concept. Relatedly, confusion over self-states is associated with a compromised ability in mentalized affectivity (*i.e.*, the capacity to understand and regulate emotional experiences; Jurist, 2005), leading to emotion dysregulation and heightened interpersonal sensitivity. In sum, compromised mentalizing capacities form the basis of self-dysfunction, which is maintained across development through unresolved epistemic mistrust and difficulties in mentalizing affects, fostering persistent negative cognitions about the self and others. Mentalization-based theory argues that when an individual is in an emotionally dysregulated state, these hated aspects of the self are activated, and associated negative affect leads one to turn harm inward in the form of STBs.

Consistent with these ideas, identity disturbance, a key component of maladaptive self-functioning, has long been recognized as a central feature of personality disorders (see Kaufman & Meddaoui, 2021 for a review; Vizgaitis & Lenzenweger, 2022). Accordingly, recent advances in psychiatric nosology have now explicitly included disturbances in self- and interpersonal functioning as the entry criterion for a personality disorder diagnosis (American Psychiatric Association, 2013; World Health Organization, 2022). Notably, suicide rates for individuals with personality disorders are among the highest compared to other psychiatric conditions (Chesney *et al.*, 2014; Schneider *et al.*, 2008), and the presence of personality disorders significantly in-

creases the risk for self-harm and suicidal ideation in young people (Sharp *et al.*, 2012; Witt *et al.*, 2019). Research has shown that individuals with comorbid BPD and major depressive disorder (MDD) are at a higher risk for suicide compared to individuals with MDD alone (Sarhan *et al.*, 2019; Söderholm *et al.*, 2020). Interestingly, Balzen *et al.* (2022) found that the IPTS explained less variance in predicting suicidal ideation among youth above the clinical threshold for borderline personality disorder (BPD), as compared to youth below this threshold. Therefore, because self-dysfunction is a cardinal feature of personality disorder, the reduced variance explained for these youth may be because the IPTS framework does not include self-functioning as a predictor of suicidal ideation.

In support of this notion, several studies have illustrated the role of self-function in predicting STBs. Specifically, research suggests that identity disturbance may play an important role in increasing the risk and severity of suicidal ideation and behaviors (Ren *et al.*, 2018; Sekowski *et al.*, 2021; Yen *et al.*, 2021). For instance, a study by Sekowski *et al.* (2021) found that identity disturbance, alongside chronic emptiness, abandonment avoidance, and transient paranoia predicted greater levels of suicidal ideation. When examining the prediction of lifetime suicide attempts, identity disturbance was the only significant predictor among all BPD criteria. Identity disturbance has also been linked to self-harm and non-suicidal self-injury (NSSI), and Claes *et al.* (2014) found that identity disturbance increments depression in explaining NSSI. Moreover, using ecological momentary assessment, Scala *et al.*, 2018 found that momentary negative affect predicted greater urges to self-harm, though only in the presence of low self-concept clarity. Notably, this effect was found for both patients with BPD and patients with anxiety disorders without BPD. Thus, emerging evidence supports the notion that disturbances in sense of self may indeed confer risk for STBs (see also Balzen & Sharp, 2024). In sum, given that self- and interpersonal functioning are inextricably linked, focusing solely on negative interpersonal cognitions without including self-functioning misses half the story of how risk for STBs are developed and maintained.

Current Study

The current study builds upon the emerging evidence base examining the role of personality functioning, specifically that of self- and interpersonal functioning, in the prediction of suicidality. We use a measure of personality functioning aligned with the DSM-5 AMPD, with self and interpersonal functioning components. Our first aim was to examine whether overall, self, and interpersonal functioning predict suicidal ideation and having made a suicide attempt. Our second aim was to evaluate the unique contribution of overall, self, and interpersonal functioning in predicting suicidal ideation and suicide attempt over and above depressive symptoms.

Methods

Participants (n=153) were recruited from a college sample (n=90) and a clinical sample with current or prior, actual or presumed borderline personality disorder diagnosis (n=63). Participants were young adults between the ages of 18 and 25 years old (M_{age}=20.93). The college sample was recruited from a public university located in the southwestern United States, while the clinical sample was recruited via study advertisements and Research Match (an online platform funded by the National Institutes of Health). Inclusion criteria for the college sample were: being between 18 and 25 years old, fluency in English, and enrollment at the university. Inclusion criteria for the clinical sample were: being between 18 and 25 years old, having either a prior or current diagnosis of BPD, or obtaining a total score of at least 6 (out of 10) on the McLean Screening Instrument for BPD (MSI-BPD Zanarini *et al.*, 2003). We chose to use BPD diagnosis as an eligibility criterion, considering research illustrating that BPD constitutes the general factor for personality disorder and, therefore, may serve as a good proxy for personality disorder more generally (Sharp *et al.*, 2015; Wright *et al.*, 2016). The college sample received course credit for their participation, while the clinical sample received financial compensation. This study was reviewed and approved by the university's Institutional Review Board.

Measures

Personality functioning (self and interpersonal functioning)

Participants completed the Level of Personality Functioning Scale - Brief Form 2.0 (LPFS-BF 2.0; Weekers *et al.*, 2019), a 12-item self-report measure assessing self-functioning and interpersonal functioning. On the LPFS-BF 2.0, self-functioning is conceptualized as identity and self-direction (3 items each), and interpersonal functioning is conceptualized as empathy and intimacy (3 items each) as described in the AMPD. Participants rated each item on a Likert scale from 1 (*completely untrue*) to 4 (*completely true*). Overall personality functioning scores were calculated by summing the ratings across all items. Self-functioning was the sum of the first six items, and interpersonal functioning was the sum of the last six items. Higher scores indicate more impaired functioning. The LPFS-BF 2.0 has demonstrated strong psychometric properties in several studies (Bach & Hutsebaut, 2018; Weekers *et al.*, 2019, 2023). Internal consistency was excellent in the current sample (Cronbach's α=.90).

Suicidal ideation

Participants completed the Personality Assessment Inventory (PAI; Morey, 1991), a 344-item self-report measure of psychopathology symptoms and variables relevant to mental health treatment. Items were rated on a 4-point Likert scale from 0 (*not true at all*) to 3 (*very true*). The PAI's suicide scale (PAI-SUI) was used as our measure of suicidal ideation, consisting of 12 items assessing passive and active suicidal ideation. The PAI has demonstrated strong psychometric properties, with good to excellent internal consistency for the PAI-SUI scale in clinical and college samples (Morey, 1991). Internal consistency was excellent in the current sample (Cronbach's α=.93).

Suicide attempts

Participants' self-reported history of suicide attempts was obtained with the interviewer-administered Columbia – Suicide Severity Rating Scale (C-SSRS; Posner *et al.*, 2008). We report the range of a number of suicide attempts, but given the positively skewed distribution of this variable, our measure of suicide attempts was binary, coded as 1 (has made an attempt) or 0 (has never made an attempt). The C-SSRS has demonstrated strong psychometric properties in prior studies (Posner *et al.*, 2011).

Depressive symptoms

Participants completed the Symptom Checklist 90 (SCL-90; Derogatis *et al.*, 1973), a self-report measure of general psychopathology. The SCL-90's depression subscale was used as our measure of depressive symptoms, but we removed the item assessing suicidal ideation ("How much were you bothered by thoughts of ending your own life?") given that we were predicting suicidal ideation and attempt, leaving 12 items remaining. Participants rated how often they were bothered by 12 depression symptoms during the past week on a Likert scale from 0 (*not at all*) to 4 (*extremely*). Ratings were summed, divided by 12, and rounded up by .005 to compute an average score. The SCL-90 is the precursor to the now widely used SCL-90-R (revised version; Derogatis, 1994); the primary differences between the two measures are revisions to the anxiety and obsessive-compulsive subscales, but the depression subscale is the same in both measures. The SCL-90-R, and its depression subscale, in particular, have demonstrated strong psychometric properties (Derogatis, 1994; Koeter, 1992; McGough & Curry, 1992). Internal consistency of the depression subscale was excellent in the current sample (Cronbach's α=.92 without the suicidal ideation item, α=.92 with the suicidal ideation item).

Demographics

Participants self-reported their age, gender identity, race, ethnicity, whether they were currently in treatment for emotional or mental health problems, and whether they were currently using medication for emotional or mental health problems. Participants' self-reported gender identities were 72% female, 19% male, 1% transgender male, and 8% nonbinary, genderqueer, or genderfluid. Dummy variables (coded 0/1 representing no/yes) were created for male, female, and other gender to explore the role of gender in bivariate correlations. In the Gender variable used in other analyses, male was coded as 1, female was coded as 2, and because we were underpowered to explore differences between other gender identities, all other gender identities were coded as 3.

Valid responding check

The PAI includes an infrequency scale (PAI-INF), for which a raw score of 9 or higher indicates careless or random responding (Morey, 2007). We examined participants' PAI-INF scores to ensure valid responses on the PAI before using the PAI-SUI scale as an outcome variable, as suggested by Morey *et al.* (2022). Upon initial examination, 51 of 145 eligible participants who had completed the PAI had a raw score of 9 or higher on the PAI-INF scale. However, we noted that 45 of these participants selected 0 (*not true at all)* or 1 (*slightly true*) for the item "Sometimes I get ads in the mail that I don't really want." This item is reverse-scored for calculation of the PAI-INF scale, such that ratings of 0 or 1 on this item result in higher overall PAI-INF scores. Given that our participants were primarily college-aged and might not receive ads in the mail, we decided that this item was not a helpful indicator of random or careless responding for the purposes of this study. We re-scored this item so that participants who selected 0 (*not true at all)* or 1 (*slightly true*) were re-scored to ratings of 2 (*mainly true*) or 3 (*very true*) respectively, ultimately reducing their PAI-INF score. After this adjustment, 23 participants had a raw score of 9 or higher on the PAI-INF scale, so these participants were not included in future analyses. Participants who were removed from analyses were not significantly different in terms of LPFS total score or PAI-SUI score. This resulted in a sample size of 122 participants who had completed the PAI (in addition to 32 other participants who completed the C-SSRS but not the PAI).

Data analysis

We calculated bivariate correlations between all study variables. If age and gender were significantly correlated with our outcome variables (suicidal ideation or suicide attempt), we included them as covariates in subsequent models.

Next, linear regression was conducted to examine whether overall personality functioning predicted suicidal ideation. Three sets of hierarchical regressions were then performed with suicidal ideation as the outcome variable and predictors entered in separate steps. The first set compared the relative contribution of self-functioning and interpersonal functioning as predictors of suicidal ideation. The second set compared the relative contribution of self-functioning and depression symptoms as predictors of suicidal ideation. The third set compared the relative contribution of interpersonal functioning and depression symptoms as predictors of suicidal ideation.

Last, a linear regression was conducted to examine whether the LPFS total score predicted suicide attempt. Three sets of hierarchical regressions were performed identically to the hierarchical regressions described above, but with suicide attempt as the outcome variable.

Results

Descriptive statistics

Descriptive statistics are presented in Table 1. Participants (n=153) were between the ages of 18 and 25 years (M_{age}=20.93, SD=2.16). 90 participants (59%) were from the college sample and 63 participants (41%) were from the clinical sample with a

Table 1. Descriptive statistics of study variables in total sample.

	Minimum	Maximum	Mean	Std. dev.	Skewness	Kurtosis
Age	18	25	20.930	2.160	0.351	-1.061
Suicidal ideation	2.00	38.00	13.657	9.394	0.768	-0.270
Number of suicide attempts	0	11	0.970	2.264	2.917	8.257
Overall personality functioning	12.00	46.00	28.837	8.127	-0.115	-0.604
Self-functioning	6.00	24.00	15.699	4.633	-0.278	-0.600
Interpersonal functioning	6.00	24.00	13.137	4.204	0.242	-0.589
Depression symptoms	0.00	3.92	1.574	1.057	0.267	-0.974

Std. dev., standard deviation.

current or prior, actual or presumed BPD diagnosis. 122 participants completed the measure of suicidal ideation, and 136 participants completed the measure of suicide attempts. 41 participants reported a prior suicide attempt (35 from the clinical sample, 6 from the college sample) and the number of attempts ranged from 0 to 11 (*M*=1.09, *SD*=2.37). 69 participants (53 from the clinical sample, 16 from the college sample) were currently in treatment for emotional or mental health problems. 54 participants (44 from the clinical sample, 10 from the college sample) were currently using medication for emotional or mental health problems. Descriptive statistics separated by clinical and college participants are available in *Supplementary Tables 1 and 2*.

Participants' gender identities were 72% female, 19% male, 1% transgender male, and 8% nonbinary, genderqueer, or genderfluid. Participants' racial identities were 57% White (28% non-Hispanic White), 8% Black, 25% Asian, 3% Middle Eastern, 3% more than one race, 1% American Indian/Alaska Native, 1% Native Hawaiian/Pacific Islander, and 2% other. 33% of participants identified as Hispanic.

Bivariate correlations between study variables, age, and gender identity are presented in Table 2. Age and gender identity were significantly correlated with suicidal ideation, indicating that older participants had higher suicidal ideation scores (r=.336, p<.001), male participants had lower suicidal ideation scores (r=-.239, p=.004), and transgender, nonbinary, genderqueer, or genderfluid participants had higher suicidal ideation scores (r=.292, p<.001). Age and gender identity were significantly correlated with having ever attempted suicide, indicating that older participants (r=.232, p=.007) and transgender, nonbinary, genderqueer, or genderfluid participants (r=.304, p<.001) were more likely to have attempted suicide. Therefore, all subsequent regression models included age and gender as predictors.

Personality functioning is associated with suicidal ideation

Overall personality functioning (r=.644, p<.001), self-functioning (r=.621, p<.001), and interpersonal functioning (r=.554, p<.001) were significantly correlated with suicidal ideation. In the linear regression model, overall personality functioning was significantly associated with suicidal ideation (β=.584, p<.001, R^2=.490). When included in the same hierarchical model, both self-functioning and interpersonal functioning were significantly associated with suicidal ideation, with a stronger effect of self-functioning (β=.374, p<.001) compared to interpersonal functioning (β=.267, p<.001). The variance explained by adding self-functioning to the hierarchical model already containing interpersonal functioning (change in R^2=.069, p<.001) was greater in magnitude than the variance explained by adding interpersonal functioning to the model already containing self-functioning (change in R^2=.039, p<.001).

Personality functioning increments depression in association with suicidal ideation

Depression symptoms were significantly correlated with suicidal ideation (r=.589, p<.001). Overall personality functioning explained significant additional variance in suicidal ideation (change in R^2=.115, p<.001) when added to a hierarchical model with depression symptoms, age, and gender (Table 3). Conversely, when depression symptoms were added to a model with overall personality functioning, age, and gender, the additional variance explained was statistically significant but smaller in magnitude (change in R^2=.032, p=.006). When included in the same hierarchical regression model, both overall personality functioning (β=.449, p<.001) and depression symptoms (β=.241, p=.006) were significantly associated with suicidal ideation; notably, the effect of overall personality functioning was nearly twice that of depression symptoms.

Self-functioning on its own also explained significant additional variance in suicidal ideation (change in R^2=.078, p<.001) when added to a model with depression symptoms, age, and gender (Table 4). Conversely, when depression symptoms were added to a model with self-functioning, age, and gender, the additional variance explained was statistically significant but smaller in magnitude (change in R^2 = .033, p = .007). When included in the same hierarchical regression model, both self-functioning and depression symptoms were significantly associated with suicidal ideation, with a stronger effect of self-functioning (β=.390, p<.001) compared to depression symptoms (β=.260, p=.007).

Interpersonal functioning on its own also explained significant additional variance in suicidal ideation (change in R^2=.099, p<.001) when added to the model with depression symptoms, age, and gender. Conversely, when depression symptoms were added to a model with interpersonal functioning, age, and gender, the additional variance explained was statistically significant but smaller in magnitude (change in R^2=.081, p<.001 When included in the same hierarchical regression model, both interpersonal

Table 2. Bivariate correlations of demographic and predictor variables with suicidal ideation and attempt in total sample.

	Suicidal ideation	Suicide attempt	Overall PF	Self PF	Interpersonal PF	Depression symptoms	Age	Male	Female
Suicidal ideation	-								
Suicide attempt	.632**	-							
Overall PF	.644**	.452**	-						
Self PF	.621**	.436**	.927**	-					
Interpersonal PF	.554**	.393**	.911**	.691**	-				
Depression symptoms	.589**	.447**	.657**	.691**	.504**	-			
Age	.336**	.232**	.300**	.301**	.247**	.246**	-		
Male	-.239**	-.126	-.178*	-.178*	-.147	-.265**	0.015	-	
Female	.015	-.079	.023	.000	.045	.094	-.181*	-.773**	-
Other gender	.292**	.304**	.205*	.242**	.130	.213**	.262**	-.153	-.508**

PF, personality functioning; **p<.001; *p<.05.

functioning (β=.360, $p<.001$) and depression symptoms (β=.348, $p<.001$) were significantly associated with suicidal ideation, with similar effect sizes.

Personality functioning is associated with suicide attempt

Overall personality functioning ($r=.452$, $p<.001$), self-functioning ($r=.436$, $p<.001$), and interpersonal functioning ($r=.393$, $p<.001$) were significantly correlated with having attempted suicide. In the linear regression model, overall personality functioning was significantly associated with having attempted suicide (β=.384, $p<.001$, $R^2=.234$). When included in the same hierarchical regression model, self-functioning (β=.246, $p=.027$) was significantly associated with having attempted suicide, but interpersonal functioning was not (β=.173, $p=.104$). The variance explained by adding self-functioning to the hierarchical model already containing interpersonal functioning (change in $R^2=.029$, $p=.027$) was greater in magnitude than the variance explained by adding interpersonal functioning to the model already containing self-functioning (change in $R^2=.016$, $p=.104$).

Personality functioning increments depression in association with suicide attempt

Depression symptoms were significantly correlated with having attempted suicide ($r=.447$, $p<.001$). Overall personality functioning explained significant additional variance in having attempted suicide (change in $R^2=.041$, $p=.008$) when added to a hierarchical model with depression symptoms, age, and gender (Table 5). Conversely, when depression symptoms were added to a model with overall personality functioning, age, and gender, the additional variance explained was statistically significant but smaller in magnitude (change in $R^2=.023$, $p=.048$). When included in the same hierarchical regression model, both overall personality functioning and depression symptoms were significantly associated with having attempted suicide, with a slightly stronger effect size for overall personality functioning (β=.273, $p=.008$) compared to depression symptoms (β=.208, $p=.048$).

Self-functioning on its own also explained significant additional variance in having attempted suicide (change in $R^2=.027$, $p=.032$) when added to a model with depression symptoms, age, and gender (Table 6). Conversely, when depression symptoms were added to a model with self-functioning, age, and gender, and the additional variance explained was statistically significant but slightly smaller in magnitude (change in $R^2=.026$, $p=.039$). When included in the same hierarchical regression model, both self-functioning and depression symptoms were significantly associated with having attempted suicide, with a slightly stronger effect size for self-functioning (β=.232, $p=.032$) compared to depression symptoms (β=.227, $p=.039$).

Interpersonal functioning on its own also explained significant additional variance in having attempted suicide (change in $R^2=.035$, $p=.015$) when added to the model with depression symp-

Table 3. Overall personality functioning is associated with suicidal ideation above and beyond depression symptoms.

Model	Predictor	Standardized β	*t*	*p*
1	(Constant)		-3.004	.003
	Age	0.296	3.546	.001
	Gender	0.291	3.491	.001
2	(Constant)		-1.879	.063
	Age	0.157	2.100	.038
	Gender	0.140	1.860	.065
	Depression symptoms	0.509	6.474	<.001
3	(Constant)		-2.973	.004
	Age	0.084	1.220	.225
	Gender	0.158	2.312	.023
	Depression symptoms	0.241	2.772	.006
	Overall personality functioning	0.449	5.306	<.001

Outcome variable is suicidal ideation. When overall personality functioning was added to the model, change in $R^2=.115$, $p<.001$. The total R^2 in Model 3 is .525.

Table 4. Self-functioning is associated with suicidal ideation above and beyond depression symptoms.

Model	Predictor	Standardized β	*t*	*p*
1	(Constant)		-3.004	.003
	Age	0.296	3.546	.001
	Gender	0.291	3.491	.001
2	(Constant)		-1.879	.063
	Age	0.157	2.100	.038
	Gender	0.140	1.860	.065
	Depression symptoms	0.509	6.474	<.001
3	(Constant)		-2.605	.010
	Age	0.091	1.271	.206
	Gender	0.152	2.150	.034
	Depression symptoms	0.260	2.748	.007
	Self-functioning	0.390	4.185	<.001

Outcome variable is suicidal ideation. When self-functioning was added to the model, change in $R^2=.078$, $p<.001$. The total R^2 in Model 3 is .487.

toms, age, and gender. Conversely, when depression symptoms were added to a model with interpersonal functioning, age, and gender, the additional variance explained was statistically significant and larger in magnitude (change in R^2=.048, p=.005). In the final step of the model, both interpersonal functioning and depression symptoms were significantly associated with having attempted suicide, with a slightly stronger effect size for depression symptoms (β=.271, p=.005) compared to interpersonal functioning (β=.219, p=.015).

Discussion

Rising suicide rates in the United States represent a significant public health risk, particularly among young people. Indeed, in our sample of young adults, 7% of college participants and 64% of clinical participants reported a past suicide attempt. While past work has focused on interpersonal drivers of STBs, the current study emphasizes the role of self-functioning in suicidal ideation and behavior. Overall personality functioning was significantly associated with suicidal ideation and past suicide attempt and was a stronger predictor of these outcomes than depression symptoms. Both self and interpersonal functioning explained additional variance in suicidal ideation and attempt above and beyond depression symptoms, with stronger effect sizes for self-functioning than interpersonal functioning.

These findings indicate the importance of considering STBs in the context of personality functioning and self-functioning in particular, rather than solely considering STBs in the context of depression and interpersonal difficulties. The current study adds to prior evidence suggesting that depressive symptoms are not the sole driver of the high suicide attempt rates among those with BPD (Kelly *et al.*, 2000; Soloff, 2000; Zeng *et al.*, 2015). Our findings also suggest the importance of examining personality functioning among those who do not meet criteria for BPD or another personality disorder. With the advancement of dimensional models of personality disorder in the DSM-5 and ICD-11, all individuals can be rated on a continuum of personality functioning ranging from healthy personality functioning to severely impaired personality functioning. This allows for the identification of subthreshold impairment in personality functioning which might provide an early indicator of risk for STBs. Identification of subthreshold impairment may be particularly critical in adolescence and young adulthood, when personality disorder typically develops (Sharp *et al.*, 2018), to provide early intervention and mitigate further development of the disorder. Further, our findings suggest that assessment of personality functioning may be particularly important among patients with depressive disorders. While there is already evidence to suggest that patients with comorbid BPD and MDD are at heightened risk for suicide compared to patients with MDD alone (Sarhan *et al.*, 2019; Söderholm *et al.*, 2020), it may also be important to identify patients with depressive

Table 5. Overall personality functioning is associated with suicide attempt above and beyond depression symptoms.

Model	Predictor	Standardized β	*t*	*p*
1	(Constant)		-2.518	.013
	Age	0.196	2.343	.021
	Gender	0.241	2.882	.005
2	(Constant)		-1.639	.104
	Age	0.098	1.210	.229
	Gender	0.126	1.524	.130
	Depression symptoms	0.376	4.390	<.001
3	(Constant)		-2.153	0.033
	Age	0.069	0.865	0.389
	Gender	0.114	1.419	0.158
	Depression symptoms	0.208	1.992	0.048
	Overall personality functioning	0.273	2.684	0.008

Outcome variable is suicide attempt. When overall personality functioning was added to the model, change in R^2=.041, p=.008. Total R^2 in Model 3 is .265.

Table 6. Self-functioning is associated with suicide attempt above and beyond depression symptoms.

Model	Predictor	Standardized β	*t*	*p*
1	(Constant)		-2.518	.013
	Age	0.196	2.343	.021
	Gender	0.241	2.882	.005
2	(Constant)		-1.639	.104
	Age	0.098	1.210	.229
	Gender	0.126	1.524	.130
	Depression symptoms	0.376	4.390	<.001
3	(Constant)		-1.997	.048
	Age	0.074	0.915	.362
	Gender	0.112	1.372	.172
	Depression symptoms	0.227	2.090	.039
	Self-functioning	0.232	2.164	.032

Outcome variable is suicide attempt. When self-functioning was added to the model, change in R^2=.027, p=.032. The total R^2 in Model 3 is .251.

disorders and subthreshold impairment in personality functioning as patients at higher risk for STBs. Tanzilli *et al.* (2024) found, for example, that adolescent patients with depressive disorders had more severe maladaptive personality traits, including depressive, anxious-avoidant, borderline, and narcissistic personality traits, than adolescent patients without depressive disorders, indicating that subthreshold personality impairment (or even undiagnosed, threshold personality impairment) might be more common among patients with depressive disorders than is currently assumed. Impaired self-functioning (*i.e.*, incoherent or unstable identity, fragile self-esteem, poor self-awareness, and limited self-direction) may in particular go unnoticed among patients with depressive disorders, as these impairments may be less readily apparent to clinicians compared to signs of interpersonal dysfunction (*i.e.*, lack of close relationships, relationship conflict, limited empathy). In sum, efforts to identify patients at higher risk for suicide might be significantly bolstered by integrating assessment of personality functioning into general clinical practice, especially with youth and with patients with depressive disorders.

There are various ways in which clinicians might integrate assessment of personality functioning into their current practice. Several measures of personality functioning are aligned with the DSM-5 AMPD and ICD-11 conceptualization of personality disorder. In the current study, personality functioning was assessed with the LPFS-BF 2.0, a 12-item self-report questionnaire that has been validated in both adolescents and adults (Weekers *et al.*, 2019; Wu *et al.*, 2024) and could easily be integrated into an intake assessment battery or ongoing outcomes tracking. Other self-report questionnaires of personality functioning include the Level of Personality Functioning Scale - Self-Report (LPFS-SR; Morey, 2017) for adults and the Levels of Personality Functioning Questionnaire (LoPF-Q 12-18; Goth *et al.*, 2018) for adolescents. While cut-off scores for determining clinically significant impairment have been established for the LoPF-Q 12-18 (Kerr *et al.*, 2023), further work is needed to establish cut-off scores for each of the other measures. Clinicians wishing to gain a more detailed picture of personality functioning (for example, if indicated because a client received a high score on a self-report measure) can use the Semi-structured Interview for Personality Functioning DSM-5 (STiP-5.1; Hutsebaut *et al.*, 2017), an interview that takes approximately 50 minutes to administer, can be reliably administered by clinicians with basic training and minimal practice, and provides a total score aligned with the AMPD LPF scale of 0 (little to no impairment) to 4 (extreme impairment). Scores of 2 (moderate impairment) or higher on the STiP-5.1 indicate clinically significant impairment (Oitsalu et al., 2022). In addition to measures aligned with the DSM-5 and ICD-11, the Psychodynamic Diagnostic Manual – second edition (PDM-2; Lingiardi & McWilliams, 2015) provides a framework for the comprehensive, idiographic assessment of personality functioning, traits, and organization, as well as several domains of mental functioning such as mentalization, attention, and impulse control capacities. The PDM aims to paint a detailed picture of each patient's unique pattern of impairments, strengths, and experiences to guide treatment through a person-centered approach. Aligned with the results of the current study, the PDM encourages clinicians to understand patients' suicidal ideation and behaviors in the context of their personality organization and other functional capacities, as this wider context may provide insights into a patient's possible motivations and triggers for STBs and help clinicians tailor treatment appropriately (Lingiardi *et al.*, 2019; see Liotti *et al.*, 2024; Williams *et al.*, 2024 for case studies detailing this approach).

Once a patient has been identified as having clinically significant or subthreshold impairment in personality functioning, the clinician then must decide how best to intervene. If a patient is found to have clinically significant impairment in personality functioning, they would likely benefit from specialist treatments for personality disorder. Our finding that self-functioning had particularly strong associations with suicidal ideation and suicide attempt underscores the importance of treating self-functioning to prevent STBs. Various personality disorder treatments scaffold optimization of self-function. For instance, mentalization-based treatment (MBT; Bateman & Fonagy, 2010) enhances reflective capacity in aid of stabilizing an individual's sense of self by helping them make sense of themselves and others. Transference-focused psychotherapy (TFP; Caligor *et al.*, 2018) reorganizes unrealistic internalized images of self and other with the aim of building a more coherent sense of self and mutually rewarding interpersonal interactions. Dialectical behavior therapy (DBT; Linehan, 1993) provides individuals with several skills that increase self-awareness and self-regulation, including mindfulness, distress tolerance and emotion regulation. Good psychiatric management (GPM; Gunderson *et al.*, 2018) aims to increase self-awareness, self-esteem, and adaptation to stress by improving psychosocial functioning. Of note, randomized controlled trials investigating the effects of MBT, TFP, DBT, and GPM on outcomes for patients with BPD demonstrated that patients in all four treatments experienced significant reduction in both STBs and depression symptoms (Bateman & Fonagy, 2009; Clarkin *et al.*, 2007; McMain *et al.*, 2009). Thus, depression symptoms do not go unaddressed when making personality functioning the primary focus of treatment.

GPM is also particularly promising for patients with subthreshold impairment in personality functioning, as this treatment can be administered by generalist clinicians without expertise in specialist treatments for personality disorder to help patients with emerging impairments get back on track with everyday functioning (Gunderson *et al.*, 2018). Similarly, GPM for adolescents (GPM-A) may hold promise for early intervention and improving adolescents' access to treatment (Boone *et al.*, 2024; Ilagan & Choi-Kain, 2021). In light of the current study's findings, generalist approaches may empower clinicians to treat clients with emerging personality functioning impairments and thus help reduce STBs without referring out to specialist care until indicated.

Each of these interventions, whether explicitly or implicitly, focuses on improving self-functioning as well as interpersonal functioning. Our findings legitimize these foci and suggest that further research may be conducted to empirically support theories connecting self-functioning to existing knowledge on the interpersonal drivers of STBs (*i.e.*, perceived burdensomeness and thwarted belongingness). Important questions in suicide research may also benefit from an enhanced focus on self-functioning, for instance, the question of whether impaired self-functioning helps differentiate between those with suicidal ideation who attempt suicide versus those who do not attempt suicide. Additionally, as previously argued and in alignment with the mentalization-based framework, future research should examine if maladaptive self-functioning promotes the development of negative interpersonal cognitions to confer risk for STBs. Moreover, time-intensive longitudinal methods aimed at identifying the dynamic interactions between maladaptive self- and interpersonal functioning in the development of STBs would greatly advance an expanded theory of suicide. In sum, integrating self-functioning into existing theoretical models may help to improve prediction of STBs.

One limitation of the current study is the restriction of participants to either college students or clinical participants with an ac-

tual or presumed prior or current diagnosis of BPD. This clinical sample is salient given estimates that up to 43% of inpatients admitted for suicidality have BPD (Gregory *et al.*, 2021) and that up to 84% of inpatients with BPD (Goodman *et al.*, 2017; Kelly *et al.*, 2000; Soloff, 2000) and up to 67% of outpatients with BPD report a past suicide attempt (Galione & Zimmerman, 2010; Zisook *et al.*, 1994). Therefore, those with BPD represent many of those who attempt suicide. However, future work should examine whether these results are replicated in more diverse clinical samples including participants without personality disorders, and in more diverse community samples. Dimensional measures of personality functioning will facilitate replication of these analyses in diverse samples, as all participants regardless of diagnostic status can be placed on the continuum of personality functioning. Further, it will be helpful to investigate whether our analyses are replicated among older adults and adolescents, the latter of which could have unique implications for early intervention given that first suicide attempts and personality disorder onset often occur during adolescence (Hoertel *et al.*, 2020; Sharp & Wall, 2018).

Other limitations of the current study include a reliance on self-report questionnaires and cross-sectional data. Personality functioning, depression symptoms, and suicidal ideation were reported with self-report questionnaires, meaning that associations between these variables likely captured shared method variance. Further, self-report questionnaires are also subject to participant biases. For example, participants with more limited insight and participants answering questionnaires while in a negative mood state (both of which may accompany psychopathology) may overestimate or underestimate the frequency and severity of certain experiences and behaviors. Other informants may have different insights into participants' personality functioning, particularly interpersonal capacities such as empathy and intimacy, and depression symptoms, particularly behavioral symptoms such as psychomotor agitation or retardation. On the other hand, it may be difficult for other informants to have insight into participants' self-functioning (*i.e.*, identity coherence, self-esteem, and self-reflection) or participants' depressed mood and suicidal ideation. In both cases, interviews with participants and other informants might provide the opportunity to gather more context and detail about participants' experiences and behaviors. Future work examining the relationship between personality functioning, depression, and suicidal ideation and attempt using multiple methods (*i.e.*, questionnaires and interviews) and multiple informants could help to limit potential shared method variance and capture a more multidimensional, contextually informed picture of psychopathology.

Additionally, participants in the clinical sample were not asked to provide documentation on how their BPD diagnosis was obtained, thus precluding our ability to confirm the diagnosis was received in an optimal manner (*i.e.*, through thorough diagnostic evaluation). Further, given that cross-sectional data precludes interpretations of directionality, it would be helpful to examine personality functioning and STBs longitudinally to determine if impaired personality functioning precedes STBs and/or if they have a bidirectional relationship. For example, one prior study by Ren *et al.* (2018) found a bidirectional relationship between identity disturbance and suicidal ideation over time in a community adolescent sample, although the effect of identity disturbance on suicidal ideation was indirect and mediated by relational disturbance. According to mentalization-based theory, an incoherent sense of self and associated negative affect is the driver of STBs. Thus, future work should use the mentalization based framework to examine if an incoherent sense of self can indeed be considered a more distal risk factor, and thereby inform methods of early intervention and prevent the development of STBs. This future work may also examine if other aspects of mentalizing that are inherently tied to self- and interpersonal functioning, such as epistemic mistrust and mentalized affectivity, also increase vulnerability to suicidality.

Strengths of the current study include the sample's racial, ethnic, and gender diversity, adding to the generalizability of our findings, but also revealing increased suicidal ideation and likelihood of suicide attempt among transgender, nonbinary, genderqueer, and genderfluid young adults. This finding aligns with prior work demonstrating significantly higher rates of suicidal ideation and attempt among transgender and nonbinary youth compared to cisgender youth (Johns *et al.*, 2019; Price-Feeney *et al.*, 2020; Reisner *et al.*, 2015). Of note, gender was still a significant predictor of suicidal ideation when personality functioning and depression symptoms were included in the models. This finding can be interpreted through the lens of the Minority Stress Model, which posits that higher rates of psychopathology in transgender and gender-diverse (TGD) individuals are primarily a result of negative social, interpersonal, and psychological experiences engendered by stigma, discrimination, and structural oppression (Hendricks & Testa, 2012; Meyer, 2003). TGD individuals may experience both distal and proximal stressors (including violence victimization, housing and employment discrimination, expectations of rejection, internalized transphobia, and concealment of gender identity) that contribute to suicidal ideation above and beyond depressive symptoms and personality functioning (Pellicane & Ciesla, 2022). Future work could continue to parse out effects of psychopathology from effects of minority stress on suicidal ideation and suicide attempt, using both quantitative and qualitative research methods as well as an intersectional framework to understand the impact of intersecting systems of oppression (Crenshaw, 1991; Cyrus, 2017; Moradi & Grzanka, 2017). Further, our findings suggest that suicide prevention efforts could be made more impactful for TGD individuals by addressing the role of minority stress above and beyond psychopathology symptoms, for example, by fostering identity development, coping strategies, resilience, and empowerment (Goldbach *et al.*, 2021). These adaptations can also be made to treatments for personality disorder; for example, Tilley *et al.* (2022) found support for the feasibility of adapting dialectical behavior therapy to meet the specific needs of TGD youth by addressing minority stressors and unique experiences such as gender dysphoria. Goldhammer *et al.* (2019) emphasized the importance of distinguishing TGD-specific experiences (*i.e.*, having a gender minority identity, behaving in ways that are more socially acceptable in the context of TGD communities, or reacting to gender minority stress) from identity diffusion and other personality disorder symptoms. In sum, gender minority stress and impairment in personality functioning should not be viewed as equivalent but may additively contribute to suicide risk. Future research could also examine how gender minority stress and impairment in personality functioning might interact to contribute to suicide risk. For example, impairments in identity coherence, self-esteem, and emotion regulation could exacerbate the impact of gender dysphoria on suicidal ideation, and impairments in understanding others' motivations and forming close relationships could exacerbate expectations of rejection among TGD individuals. Further research is necessary to explore these potential intersections.

A second strength of the current study is the examination of both personality functioning and depression symptoms as predictors of suicidal ideation and suicide attempt, given that personality

disorders and major depressive disorder are frequently comorbid (Zanarini *et al*., 1998; Zimmerman & Mattia, 1999) but not often examined together. Finally, as the field moves toward dimensional models of personality disorder diagnosis, it is important to continue to identify correlates of dimensional measures of personality functioning and to illuminate how these measures could be useful in assessment and treatment planning. The current study adds to this growing evidence base.

Conclusions

It is critical to identify malleable risk factors that can be targeted in suicide prevention and early intervention to address increasing rates of death by suicide in the United States (Turecki *et al*., 2019). Our findings underscore the importance of considering personality functioning, especially self-functioning, in suicide risk assessment and treatment. While depressive symptoms and interpersonal impairment have received the bulk of the attention in the suicide research literature, we demonstrate that impaired self-functioning is associated with suicidal ideation and attempt above and beyond these factors. Identifying and treating impairment in self-functioning has the potential to mitigate STBs among those with and without personality disorder; more research is urgently needed to test this possibility and to clarify the role of self-functioning in the development of STBs. Exploring the possibility that impairments in self-functioning might differentiate between those with suicidal ideation who attempt suicide versus do not attempt suicide is another empirical question that could have significant clinical implications. Finally, future work on the longitudinal development of depression symptoms, impairments in self-functioning, impairments in interpersonal functioning, and STBs could clarify the directionality of relationships between these constructs and strengthen suicide prevention efforts.

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Online supplementary material:

Supplementary Table 1. Descriptive Statistics of Study Variables in Clinical Sample (N=63).

Supplementary Table 2. Descriptive Statistics of Study Variables in College Sample (N=90).