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Models of Personality Disorders and Predictors of Self-injurious Thoughts and Behaviors

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## **Abstract**

This thesis explores the relationship between self-injurious thoughts and behaviors and the traditional Section II criteria BPD in comparison to the more recent levels of personality functioning (LPFS) found in Section III. Individuals with personality disorders have higher prevalence rates for self-injurious thoughts and behaviors. However, the literature has sparse information on the relationship between levels of personality-functioning and self-injurious thoughts and behaviors. So, this study aimed to assess if the levels of personality-functioning predict self-injurious thoughts and behaviors over and above the categorical BPD criteria B. To do this, a binary logistic regression and linear regression were run to analyze the BPD and levels of personality-functioning in how they predict self-injurious thoughts and behaviors. The results showed the BPD criteria B and certain LPFS domain scores were significant predictors of self-injurious thoughts and behaviors.

## **Introduction**

### **Models of Personality Disorders and Predictors of Self-injurious Thoughts and Behaviors**

#### **The Impact of Self-injurious Thoughts and Behaviors**

Self-injurious thoughts and behaviors are serious mental health difficulties that result in a wide range of negative outcomes, including relationship problems (Stanford et al., 2017), serious medical complications, and completed suicide (Lambert, 2002). Self-injury also has a substantial impact on society. For instance, the economic cost of both non suicidal self-injury (NSSI) and suicide on the Australian workforce has been estimated to be \$6.73 billion (Kinchin & Doran, 2017).

One group affected by higher rates of suicide is individuals with personality disorders. Yen and colleagues found that 9% of their personality disorder sample reported at least 1 suicide attempt. Personality disorders and their co-morbidity are risk factors for NSSI as well as suicidal thoughts and behaviors (Krysinska et al., 2006). Adolescents with BPD experience suicidal ideation earlier and with higher frequency than those without BPD (Venta et al., 2012). Additionally, Goodman and colleagues found that about 90% of BPD patients engaged in self-mutilation. Despite recognition of the intimate connections between personality pathology and self-destructive thoughts and behaviors, personality pathology has been continually understudied as a risk factor for these difficulties, and especially emerging dimensional conceptualizations of personality pathology.

#### **Defining Self-injurious Thoughts and Behaviors**

While self-injurious thoughts and behaviors are conceptually similar in that all share a common self-destructive theme, there are important distinctions between the behaviors that make up this broader category that must be made. Regarding self-injurious thoughts, suicidal ideation is characterized as thoughts of self-injury with the intention of ending one's life (Wei et al.,

2018). Suicidal ideation rates peak during mid-adolescence and decline afterwards (Rueter & Kwon, 2005) Between 2015 to 2019, over 10 million American adults reported they experienced suicidal thoughts, and 3 million adults created a suicide plan in the previous year (Ivey-Stephenson et al., 2022).

These thoughts of death and ending one's life can be differentiated from urges to self-harm and self-injurious behavior without the intent to end one's life, which is referred to as nonsuicidal self-injury (NSSI) (Cipriano et al., 2017). NSSI has been associated with childhood trauma, comorbidity with other disorders such as borderline personality disorder (BPD) (Cipriano et al., 2017). Deficits in identity has been a demonstrated predictor of self-injury and suicidal behaviors for those with BPD (Scala et al., 2018). Higher levels of negative affect predicted greater urges to self-harm, but only when self-concept clarity was low; therefore, the study suggest self-concept clarity acts as a protective effect against self-harm urges (Scala et al., 2018).

In addition, NSSI has been conceptualized as an independent disorder, Non-Suicidal Self-Injury Disorder, in the most recent addition of the American Psychological Association's Diagnostic and Statistical Manual (5th ed.; DSM-5; American Psychiatric Association, 2013). According to Sornberger and colleagues, individuals engaging in NSSI employ a wide variety of methods, with the most common being cutting, burning, scratching, and hitting. Hamza and colleagues found that the odds of attempting suicide were higher among those who engaged in NSSI than those who did not engage in NSSI. NSSI has a high prevalence rate in patients receiving psychiatric care; additionally, the prevalence of NSSI is significantly higher in patients with personality diagnosis than patients with other disorders (Ose et al., 2021). It is most common among adolescents and young adults; their lifetime rates are approximately 15% to

20%, and onset typically occurs around age 13 or 14 (Klonsky et al., 2014).

Suicide attempts in contrast, referring to engagement in potentially self-injurious behavior in which there is at least some intent to die (Nock et al., 2008), are the most serious and lethal form of self-injurious behavior. Suicide attempts are more common in younger age groups, such as the 15-24 and 25-29 age ranges, than older age groups (Brådvik & Berglund, 2009). Of adults 18 and older, 2.9% reported they had attempted suicide at least once (Mościcki et al., 1988). Over a year, the prevalence of suicidal ideation is 2.6%, followed by suicide plans (.7%), and suicide attempts at .4%; those with a history of previous attempts had the highest correlations with attempts in the 1-year period (Borges, Kessler, et al., 2006). Kessler and colleagues found that 34% transitioned from suicidal ideation to a plan; while 72% of those with a plan progressed to an attempt, 26% transitioned from ideation to an attempt without a plan.

While each type of self-injurious thought and behavior is distinct, they are interconnected. Thoughts of self-injury sometimes lead to self-injury. One study found that the intensity of suicidal ideation can fluctuate dramatically as well as immediate surges in suicidal urges. This is partly why suicidal ideation is a good predictor of lifetime risk of suicide (Harmer et al., 2020). Although some studies argue that impulsive suicides, where individuals did not experience thoughts of suicide, are common, it is important to note that participants may claim the suicide attempt was impulsive even when there was planning and preparation beforehand (May et al., 2016). It is important to note that although suicidal ideation is one of the strongest predictors of suicide attempts, only 7.4% of those experiencing suicidal ideation reported they attempted suicide (Have et al., 2009), highlighting the fact that there are multiple factors at play leading to the transition from ideation to action.

One of the proposed factors differentiating individuals who only think about suicide from those who attempt suicide is a dispositional or acquired capacity to self-injure. This acquired

capacity to self-injure involves the loss of the fear of death and fear of physical pain and injury, in addition to possible increases in physical pain tolerance (Joiner, 2005). This capacity to self-injure could be acquired through multiple pathways or a combination of pathways like dispositional or genetically related differences in pain tolerance and differences in experience with pain and injury (Klonsky and Weinberg, 2012). Frequent and severe NSSI may increase an individual's capacity to enact lethal self-injury by both reducing their fear of death and physical pain and increasing their tolerance of physical pain. While NSSI and suicidal thoughts and behavior are distinct phenomena, they also may share common etiological pathways, including higher levels of negative affect and emotional lability, deficits in interpersonal skills, problem solving, and coping, and identity disturbance (Joiner, 2005).

### **Personality Pathology, Self-Injurious Thoughts, and Self-Injurious Behaviors**

There are ten types of personality disorders: antisocial, avoidant, narcissistic, obsessive-compulsive, paranoid, and more. Borderline personality disorder (BPD) has been associated with frequent self-injurious thoughts and behaviors, with both being contained in the DSM-5's BPD diagnostic criteria (5th ed.; DSM-5; American Psychiatric Association, 2013). Chapman and colleagues explain how DSM-5 outlines BPD as instability of interpersonal relationships, impulsivity, emotion dysregulation, inaccurate self-image, and hypersensitivity to rejection.

One possible reason for the relation between self-injurious thoughts and behaviors and PDs is the centrality of interpersonal difficulties in personality pathology. Including the self and interpersonal functioning subfactors in the DSM-5 to characterize personality disorders improves personality diagnosis for capturing adaptive functioning and psychopathology (DeFife et al., 2015). The Interpersonal Theory of Suicide (ITS) posits that suicidal desire stems from both the

feeling of being a burden on others and experiencing a lack of belonging (Joiner, 2005). In BPD, Interpersonal dysfunction plays a central role as those individuals have heightened emotional reactivity to interpersonal stress and impairments in trust and cooperation (Lazarus et al., 2014). Furthermore, chronic fears of abandonment, mood instability, chaotic and intense relationships, and feelings of chronic emptiness are common experiences of those with BPD (Kreisman et al., 2006), which can result in feeling both a burden to and alienated from others. Therefore, those with personality disorders are more vulnerable to suicidal ideation.

Moreover, Joiner (2005) also suggest that individuals may progress from suicidal ideation to suicide attempts by overcoming their fear of death and pain by experiencing a painful and provocative event (PPE). PPE includes non-suicidal self-injury (NSSI) and prior non-lethal suicide attempts. The interpersonal theory of suicide proposes that repeated exposure to PPE will increase the capability for suicide; therefore, self-injury, like NSSI and suicide attempts. Consistently across studies, it was found that NSSI was a robust predictor of suicidal thoughts and behaviors (Hamza et al., 2012). Additionally, those who engage in NSSI experience minimal pain, demonstrating a higher pain tolerance than those who do not engage in NSSI (Joiner et al., 2012). NSSI may shift to nonfatal suicide behavior if suicidal desire increases intensity. The reasons for why someone increases the severity of NSSI (increases in perceived isolation, burdensomeness, etc.) can also increase suicidal ideation, which in turn increases the risk of suicide attempts (Joiner et al., 2012). Women with BPD who engage in NSSI have a higher tolerance for pain than BPD individuals who do not self-injure and individuals with depression (Joiner et al., 2012).

**The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition**



The current widely used Diagnostic manual for diagnosing mental disorders is the DSM5 (5th ed.; DSM–5; American Psychiatric Association, 201). In the DSM-III through the DSMIV, personality disorders were conceptualized as discrete categories and based on signs and traits. While this traditional personality disorder diagnostic system was ultimately retained in the DSM-5, an alternative model for conceptualizing personality disorders: the Alternative Model for Personality Disorders (AMPD) was also included in section III. Thus, DSM-5 includes both the traditional categorical system in section II and added a model in section III based on levels of functioning within the domains of self-functioning and interpersonal functioning, and on a set of dimensionally assessed maladaptive personality traits. This alternative model includes dimensional ratings of severity of interpersonal and self-function as well as 25 pathological personality traits/facets under 5 domains (Skodol et al., 2015). While there is a growing literature providing evidence for the AMPD's validity and clinical utility, there remains a lack of literature assessing its relations to self-injurious behavior and it's incremental and predictive validity in comparison to Section II PD diagnoses.

The aim of the current study was to assess whether Criterion A of the AMPD showed incremental validity over and above Section II BPD diagnostic criteria. A secondary goal of the study is to examine if particular dimensions of personality functioning were more strongly related to self-injurious thoughts and behaviors than other dimensions. The hypothesis of the study was that the LPFS overall score, self and interpersonal subfactors, and identity, selfdirection, empathy, and intimacy dimensions would show incremental validity over and above Section II BPD diagnostic criteria as measured by the MSI. Specifically, we hypothesized that the self-functioning subfactor and the identity domain would be more strongly related to our selfinjurious thoughts and behavior variables than other personality functioning domains. As

mentioned above, self-concept clarity protects individuals from self-injurious urges (Scala et al., 2018), which is why we hypothesize the self subfactor and domain of identity will be more strongly related to self-injurious thoughts and behaviors.

## Methods

### Participants

A total of 1951 individuals participated in the current study. All participants were college students at a large northeastern public university. Information about demographic breakdowns can be found in tables 1-4. Each category (class standing, gender, sexual orientation, race) had a variety of responses and good diversity. Participants' ages ranged from 18 to 66 years old (Mean= 21.94, median=18, mode=18). As shown in Table 1, nearly all participants were first- and second-year students, followed by third year students, fourth year students, and fifth year and higher.

**Table 1**

#### *Frequencies of College Year*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fifth-year or higher	10	0.5	0.5	0.5
	First-year	1296	66.4	66.4	66.9
	Fourth-year	38	1.9	1.9	68.9
	NA	20	1.0	1.0	69.9
	Second-year	394	20.2	20.2	90.1
	Third-year	193	9.9	9.9	100.0
	Total	1951	100.0	100.0	

Note: First-year = first year standing. Second-year = second year standing. Third-year = third year standing. Fourth-year = fourth year standing. Fifth-year or higher = at least a fifth year standing. NA = not applicable.

Females made up the majority of the sample (N=1440, 73.8%) followed by males (N=490, 25.1%), not applicable (N=20, 1%), and don't know (N=1, .1%). In addition to the item concerning sex, Table 2 demonstrates the variety of genders in the sample: women, men, genderqueer/gender non-conforming, transman, and transwomen. Of those who self-identified, one reported agender and another reported non-binary.

**Table 2**

*Frequencies of Gender*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Female	1425	73.0	73.0	73.0
Genderqueer/Gender non-conforming	18	0.9	0.9	74.0
Male	479	24.6	24.6	98.5
NA	21	1.1	1.1	99.6
Self-identify (please specify)	3	0.2	0.2	99.7
Trans female/trans woman	1	0.1	0.1	99.8
Trans male/trans man	4	0.2	0.2	100.0
Total	1951	100.0	100.0	

Note: female = those who identify as a female. Genderqueer/gender nonconforming = those who identify as genderqueer/gender nonconforming. Male = those who identify as a male. Trans female/trans women = those who identify as a trans female/trans woman.

Trans male/trans man= those who identify as a trans male/trans man. Self-identify = those whose identity was not listed and instead opted to type their gender in the following question. NA = not applicable.

Table 3 covers the sexual orientation of the participants. Most participants identified as heterosexual, followed by bisexual, queer, lesbian, and gay. For those who responded selfidentify, Asexual, demi, and no label, all had 1 (.1%) response respectively; pansexual had 7 (.4%) and straight had 16 (.9%).

**Table 3**

*Frequencies of Sexual Orientation*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Bisexual	164	8.4	8.4	8.4
Gay	15	0.8	0.8	9.2
Heterosexual	1636	83.9	83.9	93.0
Lesbian	18	0.9	0.9	94.0
NA	25	1.3	1.3	95.2
Queer	25	1.3	1.3	96.5
Questioning	40	2.1	2.1	98.6
Self-identify (please specify)	28	1.4	1.4	100.0
Total	1951	100.0	100.0	

Note: bisexual = individuals who are attracted to both men and women. Gay = those who identified as a man and are attracted to other men. Lesbian = those who identified as a woman and are attracted to other women. NA = not applicable. Queer = those who identified with a

sexual orientation of queer. Questioning = individuals who are exploring and unsure of who they are attracted to. Self-identify = those whose identity was not listed and instead opted to type their gender in the following question

Table 4 shows the racial frequencies of the sample. There was a variety of racial groups: White, Asian, Black/African American, Native Hawaiian or other Pacific Islander, and American Indian or Alaskan Native.

**Table 4**

*Frequencies of Race*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	White	1487	76.2	77.0	77.0
	Asian	192	9.8	9.9	86.9
	Black/African American	159	8.1	8.2	95.2
	Native Hawaiian or other Pacific Islander	11	0.6	0.6	95.8
	American Indian or Alaskan Native	6	0.3	0.3	96.1
	Unknown or does not wish to disclose	76	3.9	3.9	100.0
	Total	1931	99.0	100.0	
Missing	System	20	1.0		
Total		1951	100.0		

Note: white = individuals who identify as white. Black/African American = individuals who identify as Black/African American. Native Hawaiian or other Pacific Islander = individuals who identify as Native Hawaiian or other Pacific Islander American Indian or Alaskan Native = individuals who identify as American Indian or Alaskan Native Unknown or does not wish to disclose = individuals who do not know their race or do not wish to disclose their race.

### **Measures and Procedure**

We administered online questionnaires through an undergraduate introductory psychology subject pool. This survey was comprised of several self-report measures assessing borderline personality disorder criteria, both the traditional Section II criteria, and section III Criterion A personality functioning of the Alternative Model of Personality Disorders (AMPD), as well as scales assessing self-injurious thoughts and behaviors.

#### **The Levels of Personality Functioning Scale - Brief Form (LPFS-BF; Hutsebaut et al., 2016):**

The LPFS-BF is a 12-item measure that assesses the severity of self and interpersonal dysfunction domains of the AMPD. The self subfacet is made up of identity and self-direction dimensions. One example of identity is “I often do not know who I really am,” and one example of self-direction is “I have no sense of where I want to go in my life.” The interpersonal functioning subfacet is composed of empathy and intimacy dimensions. For example, a statement concerning empathy would be “I often have difficulty understanding the thoughts and feelings of others”, whereas an example of intimacy is “My relationships and friendships never last long.” The LPFS-BF has fair internal consistency and promising construct validity (Hutsebaut et al., 2016). The internal consistency of the LPFS scales in the current study were as follows (overall LPFS scale Cronbach alpha = .88, self-functioning Cronbach alpha = .85,

interpersonal functioning Cronbach alpha = .78, Identity Cronbach alpha = .78, self-direction Cronbach alpha = .70, empathy Cronbach alpha = .72, intimacy Cronbach alpha = .63).

**McLean Screening Instrument for Borderline Personality Disorders (MSI-BPD; Zanarini et al., 2003)**

The MSI is a ten-item true or false self-report questionnaire that assesses BPD criteria by the personality disorder module of the Diagnostic Interview for the DSM-IV (DIPD-IV; Zanarini, Frankenburg, Sickel, & Yong, 1996). Zanarini and colleagues found that with a cutoff score of 7, the MSI-BPD had a sensitivity of .81, specificity of .85, internal consistency of .74, and test-retest reliability of .72 (Zanarini et al., 2003). Although in a more recent review, Zimmerman and Balling reported that a cutoff less than 7 might be more useful for screening. Some questions include “have you often been distrustful of other people”, “have you made desperate efforts to avoid feeling abandoned or being abandoned”, and “have you had at least two other problems with impulsivity.” One item in particular ask if the participant has ever deliberately hurt themselves; when comparing the MSI scale to the FASM scale, this item was removed since the question addresses self-harm. In our study, we found the MSI-BPD had good internal consistency (Cronbach alpha of .79).

**Functional Assessment of Self-Mutilation-Three Item Version (FASM-III; Penn et al., 2003)**

The FASM-III is a self-report questionnaire measuring self-harm. It asks three yes/no questions: has there ever been a time that you engaged in deliberate self-injury, have you ever had thoughts of suicide, have you ever attempted suicide? The scale assesses the lifetime occurrence of self-injury, suicidal ideation, and suicide attempts. Penn and colleagues found the internal consistency (coefficient  $\alpha = .86$ ) of the FASM to be acceptable. We found the FASM scale has adequate internal consistency (Cronbach alpha = .68). In addition to examining

categorical (yes/no) endorsement of suicidal ideation, NSSI, and suicide attempts, we created a new variable that represented the severity of the participants' overall level of self-injurious behavior. This 5-point scale was scored as follows A score of 0 was given to participants who responded "no" to all three FASM items. A score of 1 was given to participants who endorsed suicidal ideation but not to self-injury or suicide attempts. A score of 2 was given to participants who endorsed engaging in self-injury but who did not endorse suicidal thoughts or attempts. A score of 3 was given to participants endorsed engaging in self-injury and experiencing suicidal thoughts, while not endorsing suicide attempt. A score of 4 was given to participants who endorsed experiencing suicidal thoughts and attempting suicide.

### **Data Analytic Plan**

Correlation analyses were conducted to inspect the relations between all study variables, and these correlations can be viewed in Table 5. Subsequent to the correlational analyses, a series of binary logistic regression analyses were conducted to examine whether the LPFS overall score, self and interpersonal functioning subscale scores, and domain level identity, selfdirection, empathy, and intimacy subscale scores of the LPFS predicted lifetime endorsement of suicidal ideation, NSSI, and suicide attempts over and above a count of Section II DSM-5 borderline personality disorder criteria. The binary logistic analysis can be found in tables 6-14. Similarly, after the calculation of a dimensional self-injurious thoughts and behaviors dimensional index of self-harm severity, a series of multiple linear regression analyses were conducted to examine the relation between this dimensional self-injurious thoughts and behaviors dimensional index of self-harm severity, LPFS overall, domain and subscale scores, and sum of BPD criteria. The linear regression analysis can be found in tables 15-20. We hypothesized that the LPFS and its subfactors and domains would demonstrate incremental validity over and above the sum total of





4. LPFS .51 .87 .61 -

**Interpersona**

1

5. LPFS .61 .86 .94 .55 -

**Identity**

6. LPFS .55 .87 .93 .59 .74 -

**Self direction**

7. LPFS .41 .75 .51 .89 .45 .51 -

**Empathy**

8. LPFS .49 .79 .57 .88 .54 .54 .56 -

**Intimacy**

9. NSSI .38 .34 .34 .25 .36 .28 .18 .27 -

10. SI .41 .39 .41 .27 .41 .34 .21 .28 .53 -

11. SA .23 .18 .17 .15 .19 .13 .09 .18 .44 .36 -

12. .44 .39 .40 .29 .42 .32 .20 .31 .90 .78 .63

**Severity**

**Index**

Note: bolded coefficients are significant at the  $p < .001$ . Correlations with study variables are biserial correlations. MSI = the sum of the MSI scores. LPFS = the mean overall LPFS score. LPFS Self = the mean of the Self LPFS items. LPFS Interpersonal = the mean of the Interpersonal LPFS items. LPFS Identity = the mean of the Identity LPFS items. LPFS Selfdirection = the mean of the Self-direction LPFS items. LPFS Empathy = the mean of the

Empathy LPFS items. LPFS Intimacy = the mean of the Intimacy LPFS items. NSSI = the FASM item asking about self-injury. SI = the FASM item asking about suicidal ideation. SA = the FASM item asking about suicide attempts. Severity Index = the score on the FASM-derived dimensional index of self-harm severity.

## **Binary Logistic Regression for Personality Models Predicting Self-harm Ideation**

### **Endorsement (Yes/No)**

For each of our three binary self-harm-related outcome variables, three separate multiple binary logistic regression analyses were conducted. In the first analysis, MSI sum scores and overall LPFS scores were regressed onto lifetime suicidal ideation endorsement (SI). In the second analysis, MSI sum scores were again regressed onto SI, along with self-functioning and interpersonal functioning LPFS domain scores. In the third analysis, MSI sum scores along with the four LPFS sub-domain scores (identity, self-direction, empathy, and intimacy) were regressed onto SI. Each of these three analyses were repeated while substituting lifetime NSSI endorsement and lifetime suicide attempt endorsement as the outcome variables. Furthermore, these analyses were repeated in a multiple linear regression framework predicting the FASM-derived dimensional index of self-harm severity.

In table 6 the MSI sum score and overall LPFS mean score were regressed onto suicidal ideation. The results of a Hosmer & Lemeshow test indicated the overall model provided significantly better fit than an intercept only model  $\chi^2(8) = 13.339$ ,  $p = .101$ . MSI sum significantly predicted the occurrence of SI, where for every additional BPD criterion endorsed on the MSI, participants were 1.30 times more likely to endorse experiencing suicidal ideation. Furthermore, LPFS overall scores significantly predicted endorsement of SI, where for every 1 unit increase in overall LPFS score, participants were 2.35 times more likely to endorse experiencing suicidal ideation. While at first glance the LPFS is a better predictor, the higher

odds ratio may be a result of the scale range as the overall LPFS is based on mean scores whereas the MSI is based on the sum score. These findings indicate that both the MSI and LPFS predict suicidal ideation.

**Table 6**

*Binary Logistic Model Assessing MSI and LPFS for Suicidal Ideation*

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
	0.261	0.027	96.020	1	0.000	1.299	Lower	Upper
Step 1 <sup>a</sup>							1.233	1.369
MSI								
LPFS	0.854	0.117	53.221	1	0.000	2.350	1.868	2.956
Constant	-3.318	0.200	274.096	1	0.000	0.036		

a. Variable(s) entered on step 1: MSI, LPFS.

Note: MSI = the sum score of the MSI scale. LPFS = the mean of the overall LPFS score.

Table 7 below shows the MSI sum scores were again regressed onto SI, along with selffunctioning and interpersonal functioning LPFS domain scores, results of a Hosmer & Lemeshow test indicated adequate fit to the data,  $\chi^2(8) = 7.56, p = .48$ . MSI sum significantly predicted the occurrence of SI, where for every additional BPD criterion endorsed on the MSI, participants were 1.28 times more likely to endorse experiencing suicidal ideation. Furthermore, LPFS self-functioning score significantly predicted endorsement of SI, where for every 1-unit increase in the self-functioning subfactor score, participants were 2.25 times more likely to endorse experiencing suicidal ideation. However, the LPFS interpersonal-functioning score did

not significantly predict endorsement of SI. This means that the MSI sum score and LPFS self subfacet both predicted suicidal ideation whereas the LPFS self-functioning subfacet did not predict SI.

**Table 7**

*Binary Logistic Model Assessing MSI, LPFS Self Subfacet, and LPFS Interpersonal Subfacet on Suicidal Ideation*

	B	S.E.	Wald	df	Sig.	Exp(B)	95% for EXP(B)	
							Lower	Upper
Step 1 <sup>a</sup>								
MSI	0.250	0.027	85.963	1	0.000	1.284	1.218	1.353
LPFS Self	0.810	0.102	63.484	1	0.000	2.247	1.841	2.742
LPFS Interpersonal	-0.042	0.117	0.129	1	0.719	0.959	0.763	1.205
Constant	-3.293	0.202	266.300	1	0.000	0.037		

a. Variable(s) entered on step 1: MSI, LPFS Self, LPFS Interpersonal.

Note: MSI = the sum score of the MSI items. LPFS Self = the mean score of the LPFS Self items. LPFS Interpersonal = the mean score of the LPFS Interpersonal items.

In table 8 below, MSI sum scores along with the four LPFS sub-domain scores (identity, self-direction, empathy, and intimacy) were regressed onto SI. Results of a Hosmer & Lemeshow test indicated the overall model provided adequate fit to the data  $\chi^2(8) = 7.59, p = .47$ . MSI sum significantly predicted the occurrence of SI, where for every additional BPD criterion endorsed on the MSI, participants were 1.27 times more likely to endorse experiencing suicidal ideation.

LPFS identity scores significantly predicted endorsement of SI, where for every 1-unit increase in the identity dimension score, participants were 1.99 times more likely to endorse experiencing suicidal ideation. On the other hand, the LPFS empathy, intimacy, and self-direction, did not significantly predict endorsement of SI. These findings demonstrate that the MSI sum score and LPFS identity significantly predicted suicidal ideation, but the LPFS self-direction, LPFS empathy, and LPFS intimacy did not.

**Table 8**

*Binary Logistic Model Assessing MSI, LPFS Identity Dimension, LPFS Self-direction Dimension, LPFS Empathy Dimension, and LPFS Intimacy Dimension on Suicidal Ideation*

	B	S.E.	Wald	df	Sig.	Exp(B)	95 Lower	95 Upper
Step 1 <sup>a</sup>	0.238	0.027	76.440	1	0.000	1.269	1.203	1.338
MSI								
LPFS Empathy	-0.082	0.099	0.682	1	0.409	0.922	0.759	1.119
LPFS Intimacy	0.091	0.111	0.669	1	0.413	1.095	0.881	1.362
LPFS Identity	0.686	0.103	44.391	1	0.000	1.986	1.623	2.430
LPFS Self-direction	0.099	0.108	0.849	1	0.357	1.104	0.894	1.363
Constant	-3.278	0.202	263.233	1	0.000	0.038		

a. Variable(s) entered on step 1: MSI, LPFS Empathy, LPFS Intimacy, LPFS Identity, LPFS Selfdirection.

Note: MSI = the sum of the MSI score. LPFS Empathy = the mean score of the LPFS Empathy items. LPFS Intimacy = the mean score of the LPFS Intimacy items. LPFS Identity = the mean score of the LPFS Identity items. LPFS Self-direction = the mean score of the LPFS Selfdirection items.

### **Binary Logistic Regression Analysis for Personality Models Predicting NSSI Endorsement (Yes/No)**

In Table 9, where overall MSI sum and overall LPFS score were regressed onto NSSI, results of a Hosmer & Lemeshow test indicated the adequate fit to the data  $\chi^2(8) = 5.995$ ,  $p = .648$ . MSI sum significantly predicted the occurrence of NSSI, where for every additional BPD criterion endorsed on the MSI, participants were 1.37 times more likely to endorse engaging in NSSI. Furthermore, LPFS overall scores significantly predicted endorsement of NSSI, where for every 1-unit increase in overall LPFS score, participants were 1.94 times more likely to endorse engaging in NSSI. This means that both the MSI sum score and LPFS score significantly predicted NSSI.

#### **Table 9**

*Binary Logistic Model Assessing MSI and LPFS on Non-suicidal Self-injury*

	B	S.E.	Wald	df	Sig.	Exp(B)	95% Lower	Upper
	0.311	0.031	100.801	1	0.000	1.365		
Step 1 <sup>a</sup>							1.284	1.450
MSI								
LPFS	0.665	0.130	26.340	1	0.000	1.944	1.508	2.505
Constant	-3.974	0.235	285.803	1	0.000	0.019		

Variable(s) entered on step 1: MSI, LPFS.

Note: MSI = the MSI sum score. LPFS = the mean of the overall LPFS score.

Below, Table 10 shows the MSI sum scores were again regressed onto NSSI, along with self-functioning and interpersonal functioning LPFS domain scores, results of a Hosmer & Lemeshow test indicated the overall model provided good fit to the data  $\chi^2(8) = 5.44, p = .71$ . MSI sum significantly predicted the occurrence of NSSI, where for every additional BPD criterion endorsed on the MSI, participants were 1.35 times more likely to endorse experiencing NSSI. Furthermore, LPFS self-functioning scores significantly predicted endorsement of NSSI, where for every 1-unit increase in the self-functioning score, participants were 1.76 times more likely to endorse experiencing NSSI. LPFS interpersonal-functioning scores did not significantly predict endorsement of NSSI. These findings show that the MSI sum score and LPFS self score significantly predicted NSSI, but the LPFS interpersonal-functioning did not significantly predict NSSI.



**Table 10**

*Binary Logistic Model Assessing MSI, LPFS Self Subfacet, and LPFS Interpersonal Subfacet on Nonsuicidal*

*Self-*

95% C.I. for EXP(B)

*Injury*

Lower Upper

	B	S.E.	Wald	df	Sig.	Exp(B)	1.272	1.437
Step 1 <sup>a</sup>								
MSI	0.302	0.031	93.429	1	0.000	1.352		
LPFS Self	0.565	0.112	25.340	1	0.000	1.759	1.412	2.191
LPFS Interpersonal	0.062	0.125	0.243	1	0.622	1.064	0.832	1.359
a. Constant	-3.976	0.237	282.021	1	0.000	0.019		

Variable(s) entered on step 1: MSI, LPFS Self, LPFS Interpersonal.

Note: MSI = the sum score of the MSI items. LPFS Self = the mean of the LPFS Self score.

LPFS Interpersonal = the mean of the LPFS Interpersonal score

Table 11 shows the MSI sum scores along with the four LPFS sub-domain scores (identity, self-direction, empathy, and intimacy) were regressed onto NSSI, results of a Hosmer & e where MSI sum scores along with the four LPFS sub-domain scores (identity, self-direction, empathy, and intimacy) were regressed onto NSSI, results of a Hosmer & h where MSI sum scores along with the four LPFS sub-domain scores (identity, self-direction, empathy, and intimacy) were regressed onto NSSI, results of a Hosmer & Lemeshow test indicated the overall model provided good fit to the data  $\chi^2(8) = 3.69, p = .88$ . MSI sum significantly predicted the occurrence of NSSI, where for every additional BPD criterion endorsed on the MSI, participants

were 1.329 times more likely to endorse experiencing NSSI. LPFS intimacy dimension scores significantly predicted endorsement of NSSI, where for every 1-unit increase in the intimacy dimension score, participants were 1.32 times more likely to endorse experiencing NSSI. LPFS identity dimension scores significantly predicted endorsement of NSSI, where for every 1-unit increase in the identity dimension score, participants were 1.84 times more likely to endorse experiencing NSSI. However, the LPFS empathy and self-direction dimensions did not significantly predict the endorsement of NSSI. This means that the MSI sum score, LPFS identity, and LPFS intimacy significantly predicted NSSI, but the LPFS empathy and self-direction did not.

**Table 11**

*Binary Logistic Model Assessing MSI, LPFS Identity Dimension, LPFS Self-direction Dimension, LPFS Empathy Dimension, and LPFS Intimacy Dimension on Non-suicidal Self-injury*

Step 1<sup>a</sup>

	B -	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
LPFS Empathy	0.142	0.107	1.756	1	0.185	0.867	0.703	1.071
LPFS Intimacy	0.281	0.120	5.456	1	0.019	1.324	1.046	1.676
LPFS Identity	0.611	0.115	28.403	1	0.000	1.843	1.472	2.307
LPFS Self-direction	-0.085	0.121	0.492	1	0.483	0.919	0.725	1.164
MSI	0.284	0.032	81.118	1	0.000	1.329	1.249	1.413
Constant	-3.961	0.237	279.146	1	0.000	0.019		

Variable(s) entered on step 1: LPFS Empathy, LPFS Intimacy, LPFS Identity, LPFS Selfdirection, MSI.

Note: MSI = the sum of the MSI score. LPFS Empathy = the mean score of the LPFS Empathy items. LPFS Intimacy = the mean score of the LPFS Intimacy items. LPFS Identity = the mean score of the LPFS Identity items. LPFS Self-direction = the mean score of the LPFS Selfdirection items.

### **Suicide Attempts Binary Logistic Regression Analysis for Personality Models Predicting Suicide Attempts Endorsement (Yes/No)**

In table 12, where overall MSI sum and overall LPFS score were regressed onto suicide attempt, results of a Hosmer & Lemeshow test indicated the overall model provided adequate fit to the data,  $\chi^2(8) = 6.05$ ,  $p = .64$ . MSI sum significantly predicted endorsement of suicide

attempts, where for every additional BPD criterion endorsed on the MSI, participants were 1.384 times more likely to endorse attempting suicide. However, LPFS overall scores did not significantly predict endorsement of suicide attempt. These findings demonstrate that the MSI sum score significantly predicted endorsement of suicide attempt while the LPFS overall score did not.

**Table 12**

*Binary Logistic Model Assessing MSI and LPFS on Endorsement of Suicide Attempt*

Step 1 <sup>a</sup>	B	S.E.	Wald	df	Sig.	Exp(B)	95 % C.I. for EXP(B)	
							Lower	Upper
MSI	0.325	0.050	41.943	1	0.000	1.384	1.254	1.527
LPFS	0.371	0.197	3.542	1	0.060	1.449	0.985	2.132
Constant	-4.994	0.375	177.451	1	0.000	0.007		

Variable(s) entered on step 1: MSI, LPFS.

Note: MSI = the sum score of the MSI items. LPFS = the mean of the overall LPFS score.

In Table 13, where MSI sum scores were again regressed onto suicide attempt endorsement, along with self-functioning and interpersonal functioning LPFS domain scores, results of a Hosmer & Lemeshow test indicated the overall model provided adequate fit to the data,  $\chi^2(8) = 6.92, p = .55$ . MSI sum significantly predicted the occurrence of suicide attempt, where for every additional BPD criterion endorsed on the MSI, participants were 1.38 times more likely to endorse experiencing suicide attempt. However, both the self-functioning and interpersonal-functioning domains of the LPFS did not significantly predict endorsement of

attempting suicide. These findings show that the MSI sum score significantly predicted endorsement of SA while the LPFS self-functioning and LPFS interpersonal-functioning Subfacets did not.

**Table 13**

*Binary Logistic Model Assessing MSI, LPFS Self Subfacet, and LPFS Interpersonal Subfacet on Endorsement of Suicide Attempt*

Step 1 <sup>a</sup>	B	S.E.	Wald	df	Sig.	Exp(B)	95% for EXP(B)	
							Lower	Upper
MSI	0.323	0.051	40.665	1	0.000	1.382	1.251	1.526
LPFS Self	0.221	0.175	1.586	1	0.208	1.247	0.885	1.758
LPFS Interpersonal	0.147	0.186	0.630	1	0.427	1.159	0.805	1.667
Constant	-4.997	0.376	176.703	1	0.000	0.007		

Variable(s) entered on step 1: MSI, LPFS Self, LPFS Interpersonal.

Note: MSI = the sum score of the MSI items. LPFS Self = the mean of the LPFS Self score.

LPFS Interpersonal = the mean of the LPFS Interpersonal score.

In Table 14, where MSI sum scores along with the four LPFS sub-domain scores (identity, self-direction, empathy, and intimacy) were regressed onto suicide attempt, results of a Hosmer & Lemeshow test indicated the overall model provided significantly better fit than an intercept only model  $\chi^2(8) = 12.23, p = .14$ . MSI sum significantly predicted the occurrence of

suicide attempt, where for every additional BPD criterion endorsed on the MSI, participants were 1.34 times more likely to endorse experiencing suicide attempt. Furthermore, LPFS intimacy dimension scores significantly predicted endorsement of suicide attempt, where for every 1-unit increase in the intimacy dimension score, participants were 1.66 times more likely to endorse experiencing suicide attempt. The LPFS identity dimension scores significantly predicted endorsement of suicide attempt, where for every 1-unit increase in the identity dimension score, participants were 1.67 times more likely to endorse experiencing suicide attempt. On the other hand, LPFS empathy and LPFS self-direction did not significantly predict endorsement of attempting suicide. This means that the MSI sum score, LPFS identity and LPFS intimacy dimensions significantly predicted endorsement of SA, whereas the LPFS empathy and selfdirection dimensions did not.

**Table 14**

*Binary Logistic Model Assessing MSI, LPFS Identity Dimension, LPFS Self-direction Dimension, LPFS Empathy Dimension, and LPFS Intimacy Dimension on Endorsement of Suicide Attempt*

Step 1 <sup>a</sup>	B	S.E.	Wald	df	Sig.	Exp(B)	95% I. for EXP(B)	
							Lower	Upper
MSI	0.293	0.051	32.881	1	0.000	1.340	1.213	1.481
LPFS Empathy	-0.248	0.163	2.294	1	0.130	0.781	0.567	1.076
LPFS Intimacy	0.506	0.179	7.967	1	0.005	1.659	1.167	2.357
LPFS Identity	0.515	0.180	8.210	1	0.004	1.673	1.177	2.379
LPFS Selfdirection	-0.352	0.192	3.370	1	0.066	0.703	0.483	1.024
Constant	-4.980	0.377	174.085	1	0.000	0.007		

a. Variable(s) entered on step 1: MSI, LPFS Empathy, LPFS Intimacy, LPFS Identity, LPFS Self-direction.

Note: MSI = the sum of the MSI score. LPFS Empathy = the mean score of the LPFS Empathy items. LPFS Intimacy = the mean score of the LPFS Intimacy items. LPFS Identity = the mean score of the LPFS Identity items. LPFS Self-direction = the mean score of the LPFS Selfdirection items.

### **Linear Regression Analysis for Personality Models Predicting the Severity of Self-injurious**

**Thoughts and Behaviors**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Change Statistics	df1	df2
1	.464 <sup>a</sup>	0.215	0.214	1.15371	Change	F Change	df1		

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	0.215	258.393	2
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As seen in table 15, MSI sum and overall LPFS together significantly predicted FASM Severity scores. In Table 16, analysis of individual coefficients suggested that when controlling for the number of MSI BPD criteria endorsed, for every 1-unit increase in overall LPFS score, there was a .39 unit increase in FASM Severity score. In addition, Table 13 also shows that when controlling for overall LPFS scores, for every additional BPD criteria endorsed, there was a .17 unit increase in FASM Severity scores. These findings suggest that the MSI sum and LPFS overall scores significantly predict FASM severity.

**Table 15**

*Linear Regression Model Summary of MSI and LPFS in Predicting FASM Severity*

a. Predictors: (Constant), LPFS, MSI

Note: MSI = sum of the MSI items. LPFS = mean of the overall LPFS items.

**Table 16**

*Linear Regression Coefficients of MSI and LPFS in Predicting FASM Severity*

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	95.0% Confidence Interval		Collinearity Statistics	
					Lower Bound	Upper Bound	Tolerance	VIF
1								
	B	Beta	t	Sig.				
(Constant)	0.089		-5.510	0.000	-0.663	-0.315		
a.	0.489			0.000				
MSI	0.165	0.330	12.467	0.000	0.139	0.191	0.595	1.679
LPFS	0.394	0.178	6.739	0.000	0.280	0.509	0.595	1.679

Dependent Variable: FASM severity

Note: MSI = the sum of the MSI items. LPFS = the mean of the overall LPFS score.

In Table 17, MSI sum scores were again regressed onto FASM severity, along with self-functioning and interpersonal functioning LPFS domain scores. Table 18 demonstrates the coefficient analysis. Analysis of individual coefficients suggested that when controlling for the number of MSI BPD and LPFS interpersonal-functioning criteria endorsed, for every 1-unit increase in self-functioning LPFS score, there was a .34 unit increase in FASM Severity score. In addition, when controlling for both interpersonal and self-functioning LPFS scores, for every additional BPD criteria endorsed, there was a .16 unit increase in FASM Severity scores.

However, the interpersonal-functioning score did not significantly predict FASM severity. This means that the MSI sum score and LPFS self-functioning subfactor both significantly predicted FASM severity while the LPFS interpersonal-functioning did not.

**Table 17**

*Linear Regression Model Summary of MSI, LPFS Self-functioning, and LPFS Interpersonal-functioning in Pred*

a. Predictors: (Constant), LPFS Interpersonal, MSI, LPFS Self

Model	R	R Square	Adjusted R Square		Std. Error of the Estimate	F Change	df1	df2
			Change	Square				
1	.469 <sup>a</sup>	0.220	0.218	1.15058	0.220	176.961	3	1

Note: MSI = the sum score of the MSI items. LPFS Self = the mean of the LPFS Self score.

LPFS Interpersonal = the mean of the LPFS Interpersonal score.

**Table 18**

*Linear Regression Coefficients of MSI, LPFS Self-functioning, and LPFS Interpersonal-functioning in Predicting FASM Severity*

	Unstandardized		Standardized	t	Sig.	95.0%		Tolerance	VIF
	Coefficients					Confidence Interval for B			
	B	Std. Error	Beta			Lower Bound	Upper Bound		
(Constant)	-0.467	0.089		-5.266	0.000	-0.641	-0.293		
MSI	0.160	0.013	0.319	12.016	0.000	0.134	0.186	0.587	1.703
Model									
1									
LPFS Self	0.338	0.051	0.191	6.617	0.000	0.238	0.438	0.495	2.021
a. LPFS Interpersonal	0.021	0.060	0.009	0.358	0.721	-0.096	0.139	0.600	1.667

Dependent Variable: FASM severity

Note: MSI = the sum score of the MSI items. LPFS Self = the mean of the LPFS Self score.

LPFS Interpersonal = the mean of the LPFS Interpersonal score.

Table 19 shows that MSI sum scores along with the four LPFS sub-domain scores (identity, self-direction, empathy, and intimacy) were regressed onto FASM severity. Table 20 shows the individual coefficients. Analysis of individual coefficients suggested that when controlling for the LPFS intimacy, identity, and self-direction dimensions and the number of MSI BPD criteria endorsed, for every 1-unit increase in empathy LPFS score, there was a -.10 unit increase in FASM Severity score. Analysis of individual coefficients suggested that when controlling for the LPFS empathy, identity, and self-direction dimensions and the number of MSI BPD criteria endorsed, for every 1-unit increase in intimacy LPFS score, there was a .17 unit

increase in FASM Severity score. Analysis of individual coefficients suggested that when controlling for the LPFS intimacy, empathy, and self-direction dimensions and the number of MSI BPD criteria endorsed, for every 1-unit increase in identity LPFS score, there was a .38 unit increase in FASM Severity score. In addition, when controlling for the four LPFS dimensions, for every additional BPD criteria endorsed, there was a .15 unit increase in FASM Severity scores. However, the self-direction dimension, did not significantly predict endorsement of attempting suicide. These results show that the MSI sum score, LPFS intimacy, empathy, and identity dimensions all significantly predicted FASM severity while the LPFS self-direction did not.

**Table 19**

*Linear Regression Model Summary of MSI, LPFS Identity Dimension, LPFS Self-direction Dimension, LPFS Empathy Dimension, and LPFS Intimacy Dimension in Predicting FASM Severity*

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.483 <sup>a</sup>	0.234	0.232	1.14084	0.234	114.870	5	1884	0.000

a. Predictors: (Constant), LPFS Self-direction, LPFS Empathy, MSI, LPFS Intimacy, LPFS Identity

**Table 20**

*Linear Regression Coefficients of MSI, LPFS Self Dimension, LPFS Identity Dimension, LPFS Empathy Dimension, and LPFS Intimacy Dimension in predicting FASM Severity*

Model		Unstandardized		Standardized	t	Sig.	95.0% Confidence		Collinearity	
		Coefficients		Coefficients			Interval for B		Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-0.464	0.088		-5.269	0.000	-0.637	-0.291		
	MSI	0.149	0.013	0.296	11.144	0.000	0.123	0.175	0.575	1.740
	LPFS Empathy	-0.101	0.050	-0.052	-2.012	0.044	-0.199	-0.003	0.619	1.615
	LPFS Intimacy	0.174	0.056	0.084	3.086	0.002	0.063	0.285	0.555	1.803
	LPFS Identity	0.379	0.052	0.238	7.304	0.000	0.277	0.480	0.384	2.605
	LPFS Self-direction	-0.061	0.054	-0.036	-1.128	0.259	-0.167	0.045	0.406	2.464

a. Dependent Variable: FASM severity

Note: MSI = the sum of the MSI score. LPFS Empathy = the mean score of the LPFS Empathy items. LPFS Intimacy = the mean score of the LPFS Intimacy items. LPFS Identity = the mean score of the LPFS Identity items. LPFS Self-direction = the mean score of the LPFS Self-direction items.

## Discussion

The goal of the study was to examine the incremental validity of Section II vs Section III of the DSM-5 for predicting self-harm. A secondary goal of the study was to examine if particular dimensions of personality functioning were more strongly related to self-injurious thoughts and behaviors than other dimensions. We hypothesized that the LPFS and its subfactors and domains would demonstrate incremental validity over and above Section II BPD criteria as measured by the MSI. In particular we hypothesized that the domain of self-functioning and its

subdomain of identity would be more strongly related to our outcome variables than other domains of personality functioning.

The results of binary logistic regression demonstrated the number of MSI BPD criteria, overall LPFS score, self-functioning subfactor score, and identity dimension score all significantly predicted suicidal ideation. The results of binary logistic regression analyses showed that the number of MSI BPD criteria, overall LPFS score, self-functioning subfactor scores, intimacy dimension scores, and identity dimension score, significantly predicted endorsement NSSI. Similarly, binary logistic regression analyses demonstrated the MSI BPD criteria, intimacy dimension, and identity dimension significantly predicted endorsement of attempting suicide. The results of linear regression analyses demonstrated the number of MSI BPD criteria, overall LPFS score, self-functioning subfactor scores, intimacy dimension scores, and identity dimension scores significantly predicted FASM severity. Interestingly, empathy subfactor scores were marginally and negatively related to FASM severity. The interpersonal subfactor score and self-direction dimension score were not significant predictors of endorsement for SI, NSSI, SA, or FASM severity.

The results of the current study suggest that while overall personality dysfunction is positively related to the occurrence of multiple domains of self-injurious thought and behavior, the personality functioning domains of identity and intimacy may be particularly important risk factors for self-injurious thoughts and behaviors. Identity in the current study exhibiting relations with suicidal thoughts, NSSI, suicide attempts, and the overall severity of self-harm presentation is consistent with previous studies demonstrating relations between identity-related constructs such as self-concept clarity and non-suicidal self-injury (Lear & Pepper, 2016). Lear and colleagues found that identity instability is a contributing factor in the relationship between

emotion dysregulation and NSSI severity. Self-concept clarity was significantly negatively related to NSSI engagement (Lear & Pepper 2016). Moreover, Scala and Colleagues found that self-concept clarity plays an important role in protecting against self-injurious thoughts and behaviors. Therefore, individuals who are low in self-concept clarity may be more vulnerable to self-injurious urges.

Furthermore, among personality disorder diagnoses, those with borderline personality disorder exhibit high rates of self-injurious behaviors (Goodman et al. 2017), so much so that it is the only personality disorder where deliberate self-injurious thoughts and behaviors itself listed in its diagnostic criteria. Among adolescents and adult borderline patients, about 90% engaged in self-mutilation and 75% attempted suicide (Goodman et al. 2017). While a major theoretical account concerning the development and nature of borderline personality disorder view emotion dysregulation as the core of dysfunction (Linehan, 1993), another posited by Otto Kernberg takes identity disturbance to be at the core of borderline personality dysfunction (Kernberg, 2015). Kernberg views an integrated identity as a stable foundation on which our emotional experiences depend, and when identity is instead un-integrated or diffuse, emotion dysregulation and impulsive and self-destructive behaviors are the suggested result.

In addition to identity, the intimacy domain of the LPFS interpersonal functioning factor showed positive relations with NSSI and suicide attempts, as well as dimensional FASM severity. NSSI, suicide attempts, and overall FASM-severity demonstrating relations with difficulties maintaining lasting relationships and friendships, feeling uncomfortable in relationships that are more personal, and difficulties cooperatively interacting with others that are indicated by higher scores on this LPFS intimacy domain align with the large body of literature demonstrating interpersonal factors to be especially salient risk factors for suicidal thoughts and



behaviors (Joiner et al., 2010). However, the intimacy domain of criterion A in the alternative model has not been studied in relation to self-injurious thoughts and behaviors extensively. Instead, other subjective interpersonal experiences like perceived burdensomeness, thwarted belongingness, loneliness, and worthlessness have been more extensively studied in relation to self-injurious thoughts and behaviors.

Contrary to our hypotheses, LPFS intimacy domain scores did not significantly predict the endorsement of suicidal ideation in the current study. One possible reason for this result could be that the three items making up the intimacy domain of the LPFS-BF 2.0 primarily assess the degree of instability in relationships, “My relationships and friendships never last long”, a general level of comfort with closeness, “I often feel very vulnerable when relations become more personal”, and the degree of conflict in relationships, “I often do not succeed in cooperating with others in a mutually satisfactory way.” However, subjective experience of one’s own role in relationship dysfunction and the emotional impact of relationship dysfunction is not captured in this LPFS intimacy domain used. It could be that these more self-evaluative aspects of intimacy could be more related to suicidal thoughts than self-injurious behaviors. However, this rationale is at this point speculative, and future studies should use more comprehensive assessments of intimacy to better evaluate this tentative hypothesis.

Another interesting finding was that the empathy dimension scores were marginally and negatively related to FASM severity. In other words, the greater the impairment in empathy functioning, the lower the FASM severity score. It could be that those with a lower capacity for empathy, such as those with narcissistic or antisocial dispositions, are less likely to think about or actively harm themselves due to fewer negative self-perceptions. However, this rationale was unable to be evaluated in the current study, and future research could better evaluate this

hypothesis by implementing a more comprehensive measure of empathy along with narcissistic, schizoid, schizotypal, and antisocial traits.

### **Strengths and Limitations**

There are several strengths and limitations to the study that deserve mention. One strength of the study is the large sample: there were 1951 participants. A large sample size is necessary to detect the effects of the analysis (Cohen, 2016). This large sample size improves statistical power and our ability to detect significant effects if they are present. Additionally, we sampled college aged students, which is the age range who has the highest prevalence rates of self-injurious thoughts and behaviors.

One limitation is that the sample was rather homogenous and could have better represented the changing diversity in the United States. Most of the participants were women (N=1440, 73.8%) and men (N=490, 25.1%) heterosexual (N=1636, 83.9%) and bisexual (N=164, 8.4%), and White (N= 1487, 76.2%), Asian (N= 192, 9.8%), Black/African American (N=159, 8.1%). Although one strength was that the average age was 21.94, indicating that participants reflected the age range with the highest rates of self-injurious thoughts and behaviors. All participants were college students from a northeastern public university. These demographic characteristics may influence the results of the study and make them less generalizable to people from less represented groups. Future research should focus on certain demographic groups to ensure the results of the current study generalize to those groups' experiences.

Another potential limitation is the sample of the current study was drawn from a nonclinical population. Because the participants come from a university subject pool, the results might have less generalizability to outpatient or inpatient samples due to possible differences in self-harm severity or occurrence of self-injurious thoughts and urges in the context of another

serious psychopathology. However, it may be that some of the participants are in therapy or should be due to self-injurious thoughts and behaviors. After all, sometimes completely clinical samples can be skewed. Additionally, it is important to note that our sample primarily consisted of college age students, which have high prevalence rates of self-injurious thoughts and behaviors. Future studies could sample from a clinical population to examine the relations between personality functioning and self-injurious thoughts and behaviors.

An additional limitation is the measurement of self-injurious thoughts and behaviors in the current study. The FASM scale items were binary categorical items (“yes” or “no”). Thus, more fine-grained and dimensionally assessed information about the frequency and severity of self-injurious thoughts and behaviors was not gathered, nor was information gathered about the methods of self-injury. However, in the current study we did assess the severity of self-injurious thoughts and behaviors by assigning scores based on the combination of suicidal thoughts, NSSI, and suicidal attempts endorsed, where the presence of self-injurious thoughts and behaviors were interpreted as indications of higher severity than ideation alone. Future research could more comprehensively measure self-injurious thoughts and behaviors by using additional scales that measure the frequency of suicidal thoughts, NSSI, and suicidal behaviors, dimensional scales to measure the severity of suicidal ideation and NSSI, and items recording the types of selfinjurious methods used.

The LPFS scales’ reliability could be improved in future studies by utilizing a more reliable version of the LPFS: overall LPFS scale Cronbach alpha = .88, self-functioning Cronbach alpha = .85, interpersonal-functioning Cronbach alpha = .78, Identity Cronbach alpha = .78, self-direction Cronbach alpha =.70, empathy Cronbach alpha = .72, intimacy Cronbach alpha = .63. Furthermore, certain subfacets and domains showed incremental validity, when

controlling for BPD criteria, they were significant predictors for some/all of the FASM items and dimensional index of self-harm severity. The results partially support incremental validity of personality functioning as predictors of self-injurious thoughts and behaviors (FASM items). The results of the current study support the hypothesis that overall personality functioning as well as subordinate domains demonstrate incremental validity over and above Section II BPD criteria.

Despite the limitations mentioned above, the current study has significant strengths that warrant mentioning while limiting the generalizability of the current results to other populations. Utilization of a university undergraduate sample is both appropriate and important given since suicidal thoughts and behavior in this population are prevalent. Moreover, the large sample size of the current study ensured sufficient statistical power to detect statistically significant effects. Additionally, this study contributes information to the sparse literature of the relations between criterion A of the AMPD and self-injurious thoughts and behaviors by providing evidence for the incremental validity of multiple domains of criterion A of the AMPD over criterion B of the BPD criteria, and by providing evidence for specific dimensions of personality functioning being more related to self-injurious thoughts and behaviors than others.

## References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
- Borges, G., Angst, J., Nock, M. K., Ruscio, A. M., Walters, E. E., & Kessler, R. C. (2006). A risk index for 12-month suicide attempts in the National Comorbidity Survey Replication (NCS-R). *Psychological medicine, 36*(12), 1747-1757.
- Brådvik, L., & Berglund, M. (2009). Repetition and severity of suicide attempts across the life cycle: a comparison by age group between suicide victims and controls with severe depression. *BMC psychiatry, 9*, 1-7.
- Chapman, J., Jamil, R. T., & Fleisher, C. (2023, June 2). *Borderline Personality disorder*. StatPearls - NCBI Bookshelf. <https://www.ncbi.nlm.nih.gov/books/NBK430883/>
- Cipriano, A., Cella, S., & Cotrufo, P. (2017). Nonsuicidal Self-injury: A Systematic Review. *Frontiers in Psychology, 8*. <https://doi.org/10.3389/fpsyg.2017.01946>
- Clarkin, J. F., & Kernberg, O. F. (2015). *Transference-focused psychotherapy for borderline personality disorder: A clinical guide*. American Psychiatric Pub.
- Cohen, J. (2016). *A power primer*.
- DeFife, J. A., Goldberg, M., & Westen, D. (2015). Dimensional assessment of self-and interpersonal functioning in adolescents: Implications for DSM-5's general definition of personality disorder. *Journal of Personality Disorders, 29*(2), 248-260.
- Goodman, M., Tomas, I. A., Temes, C. M., Fitzmaurice, G. M., Aguirre, B. A., & Zanarini, M. C. (2017). Suicide attempts and self-injurious behaviours in adolescent and adult patients with borderline personality disorder. *Personality and mental health, 11*(3), 157-163.

- Hamza, C. A., Stewart, S. L., & Willoughby, T. (2012). Examining the link between nonsuicidal self-injury and suicidal behavior: A review of the literature and an integrated model. *Clinical psychology review, 32*(6), 482-495.
- Hamza, C. A., & Willoughby, T. (2016). Nonsuicidal self-injury and suicidal risk among emerging adults. *Journal of Adolescent Health, 59*(4), 411-415.
- Have, M. T., De Graaf, R., Van Dorsselaer, S., Verdurmen, J., Van't Land, H., Vollebergh, W., & Beekman, A. (2009). Incidence and course of suicidal ideation and suicide attempts in the general population. *The Canadian Journal of Psychiatry, 54*(12), 824-833.
- Hutsebaut, J., Feenstra, D. J., & Kamphuis, J. H. (2016). Development and preliminary psychometric evaluation of a brief self-report questionnaire for the assessment of the DSM-5 level of Personality Functioning Scale: The LPFS brief form (LPFS-BF). *Personality Disorders: Theory, Research, and Treatment, 7*(2), 192.
- Ivey-Stephenson, A., Crosby, A. E., Hoenig, J. M., Gyawali, S., Park-Lee, E., & Hedden, S. L. (2022). Suicidal thoughts and behaviors among adults aged  $\geq 18$  years — United States, 2015–2019. *Morbidity and Mortality Weekly Report, 71*(1), 1–19.  
<https://doi.org/10.15585/mmwr.ss7101a1>
- Joiner, T. (2005). *Why people die by suicide*. Harvard University Press.
- Joiner, T. E., Ribeiro, J. D., & Silva, C. (2012). Nonsuicidal self-injury, suicidal behavior, and their co-occurrence as viewed through the lens of the interpersonal theory of suicide. *Current Directions in Psychological Science, 21*(5), 342-347.
- Kessler, R. C., Borges, G., & Walters, E. E. (1999). Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. *Archives of general psychiatry, 56*(7), 617-626.

- Kinchin, I., & Doran, C. M. (2017). The economic cost of suicide and non-fatal suicide behavior in the Australian workforce and the potential impact of a workplace suicide prevention strategy. *International journal of environmental research and public health*, 14(4), 347.
- Klonsky, E. D., Saffer, B. Y., & Bryan, C. J. (2018). Ideation-to-action theories of suicide: a conceptual and empirical update. *Current opinion in psychology*, 22, 38-43.
- Klonsky, E. D., Victor, S. E., & Saffer, B. Y. (2014). Nonsuicidal Self-Injury: What we know, and what we need to know. *The Canadian Journal of Psychiatry*, 59(11), 565–568.  
<https://doi.org/10.1177/070674371405901101>
- Kreisman, J. J., & Straus, H. (2006). *Sometimes I act crazy: Living with borderline personality disorder*. John Wiley & Sons.
- Krysinska, K., Heller, T. S., & De Leo, D. (2006). Suicide and deliberate self-harm in personality disorders. *Current Opinion in Psychiatry*, 19(1), 95-101.
- Lambert, M. T. (2002). Seven-year outcomes of patients evaluated for suicidality. *Psychiatric services*, 53(1), 92-94.
- Lazarus, S. A., Cheavens, J. S., Festa, F., & Rosenthal, M. Z. (2014). Interpersonal functioning in borderline personality disorder: A systematic review of behavioral and laboratorybased assessments. *Clinical psychology review*, 34(3), 193-205.
- Lear, M. K., & Pepper, C. M. (2016). Self-concept clarity and emotion dysregulation in nonsuicidal self-injury. *Journal of personality disorders*, 30(6), 813-827.
- Linehan, M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. Guilford press.
- May, A. M., & Klonsky, E. D. (2016). “Impulsive” suicide attempts: What do we really mean?. *Personality Disorders: Theory, Research, and Treatment*, 7(3), 293.

- Mościcki, E. K., O'Carroll, P. A. T. R. I. C. K., Rae, D. S., Locke, B. Z., Roy, A., & Regier, D. A. (1988). Suicide attempts in the Epidemiologic Catchment Area study. *The Yale Journal of Biology and Medicine*, 61(3), 259.
- Nock, M. K., Borges, G., Bromet, E. J., Cha, C. B., Kessler, R. C., & Lee, S. (2008). Suicide and suicidal behavior. *Epidemiologic reviews*, 30(1), 133.
- Ose, S. O., Tveit, T., & Mehlum, L. (2021). Non-suicidal self-injury (NSSI) in adult psychiatric outpatients—A nationwide study. *Journal of psychiatric research*, 133, 1-9.
- Penn, J. V., Esposito, C. L., Schaeffer, L. E., Fritz, G. K., & Spirito, A. (2003). Suicide attempts and self-mutilative behavior in a juvenile correctional facility. *Journal of the American Academy of Child & Adolescent Psychiatry*, 42(7), 762-769.
- Pilkonis, P. A., Johnston, K. L., & Dodds, N. E. (2021). Validation of the Three-Item Screener for Personality Disorders From the Inventory of Interpersonal Problems (IIP-3). *Journal of Personality Disorders*, 35(5), 750-763.
- Rueter, M. A., & Kwon, H. K. (2005). Developmental trends in adolescent suicidal ideation. *Journal of Research on Adolescence*, 15(2), 205-222.
- Scala, J. W., Levy, K. N., Johnson, B. N., Kivity, Y., Ellison, W. D., Pincus, A. L., ... & Newman, M. G. (2018). The role of negative affect and self-concept clarity in predicting self-injurious urges in borderline personality disorder using ecological momentary assessment. *Journal of Personality Disorders*, 32(Supplement), 36-57.
- Skodol, A. E., Morey, L. C., Bender, D. S., & Oldham, J. M. (2015). The Alternative DSM-5 Model for Personality Disorders: a Clinical Application. *American Journal of Psychiatry*, 172(7), 606–613. <https://doi.org/10.1176/appi.ajp.2015.14101220>
- Sornberger, M. J., Heath, N. L., Toste, J. R., & McLouth, R. (2012). Nonsuicidal self-injury and gender: Patterns of prevalence, methods, and locations among adolescents. *Suicide and*



- Life-Threatening Behavior*, 42(3), 266-278.
- Stanford, S., Jones, M. P., & Loxton, D. J. (2017). Understanding women who self-harm: Predictors and long-term outcomes in a longitudinal community sample. *Australian & New Zealand Journal of Psychiatry*, 51(2), 151-160.
- Harmer, B., Lee, S., Duong, T. V. H., & Saadabadi, A. (2020). Suicidal ideation.
- Wei, S., Li, H., Hou, J., Chen, W., Tan, S., Chen, X., & Qin, X. (2018). Comparing characteristics of suicide attempters with suicidal ideation and those without suicidal ideation treated in the emergency departments of general hospitals in China. *Psychiatry research*, 262, 78-83.
- Weinberg, A., & Klonsky, E. D. (2012). The effects of self-injury on acute negative arousal: A laboratory simulation. *Motivation and Emotion*, 36, 242-254.
- Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S. R., Selby, E. A., & Joiner Jr, T. E. (2010). The interpersonal theory of suicide. *Psychological review*, 117(2), 575.
- Venta, A., Ross, E., Schatte, D., & Sharp, C. (2012). Suicide ideation and attempts among inpatient adolescents with borderline personality disorder: Frequency, intensity and age of onset. *Personality and Mental Health*, 6(4), 340-351.
- Yen, S., Shea, T., Pagano, M., Sanislow, C. A., Grilo, C. M., McGlashan, T. H., ... & Morey, L. C. (2003). Axis I and axis II disorders as predictors of prospective suicide attempts: findings from the collaborative longitudinal personality disorders study. *Journal of abnormal psychology*, 112(3), 375.
- Zanarini, M. C., Frankenburg, F. R., Sickel, A. E., & Yong, L. (1996). The diagnostic interview for DSM-IV personality disorders (DIPD-IV). *Belmont, MA: McLean Hospital*, 340. Zanarini, M. C., Vujanovic, A. A., Parachini, E. A., Boulanger, J. L., Frankenburg, F. R., & Hennen, J.

(2003). A screening measure for BPD: The McLean screening instrument for borderline personality disorder (MSI-BPD). *Journal of personality disorders, 17*(6), 568-573.

Zimmerman, M., & Balling, C. (2021). Screening for borderline personality disorder with the McLean Screening Instrument: a review and critique of the literature. *Journal of Personality Disorders, 35*(2), 288-298