

## Rethinking Impulsivity in Suicide

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Elevated impulsivity is thought to facilitate the transition from suicidal thoughts to suicidal behavior. Therefore, impulsivity should distinguish those who have attempted suicide (attempters) from those who have only considered suicide (ideators-only). This hypothesis was examined in three large nonclinical samples: (1) 2,011 military recruits, (2) 1,296 college students, and (3) 399 high school students. In sample 1, contrary to traditional models of suicide risk, a unidimensional measure of impulsivity failed to distinguish attempters from ideators-only. In samples 2 and 3, which were administered a multidimensional measure of impulsivity (i.e., the UPPS impulsive behavior scale; Whiteside & Lynam, 2001), different impulsivity-related traits characterized attempters and ideators-only. Whereas both attempters and ideators-only exhibited high urgency (the tendency to act impulsive in the face of negative emotions), only attempters exhibited poor premeditation (a diminished ability to think through the consequences of one's actions). Neither attempters nor ideators-only exhibited high sensation seeking or lack of perseverance. Future research should continue to distinguish impulsivity-related traits that predict suicide ideation from those that predict suicide attempts, and models of suicide risk should be revised accordingly.

Suicide accounts for 1.4% of all deaths in the United States (Heron et al., 2009), and the U.S. Surgeon General (U.S. Public Health Service, 1999) and U.S. Department of Health and Human Services (2000) have highlighted the need to better identify individuals at risk. Contemporary models of suicide risk emphasize the role of impulsivity (Bryan & Rudd, 2005; Joiner, Walker, Rudd, & Jobes, 1999; Mann, Waternaux, Haas, & Malone, 1999). High impulsivity is thought to increase the chances that individuals with suicidal ideation will act on their suicidal

thoughts and make an attempt. Indeed, several studies have reported strong links between impulsivity and suicidal behavior (Brodsky, Malone, Ellis, Dulit, & Mann, 1997; Kingsbury, Hawton, Steinhardt, & James, 1999; Mann et al., 1999; Nock & Kessler, 2006). However, other studies describe mixed or null findings regarding the impulsivity-suicide relationship, and researchers have struggled to reconcile conflicting results (Horesh, 2001; Keilp et al., 2006; Oquendo et al., 2000).

Notably, none of the aforementioned studies directly tested the hypothesis that impulsivity increases risk of attempts among those considering suicide (i.e., among ideators). Such a study would, ideally, determine if impulsivity prospectively predicts suicidal behavior among a sample of ideators. However, even a cross-sectional study can be useful if impulsivity in attempters is compared to impulsivity in those who have considered but never attempted suicide. Models of im-

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pulsivity in suicide (Joiner et al., 1999; Mann et al., 1999) suggest that impulsivity should be highest in those who have engaged in suicidal behavior. To our knowledge only one study has conducted this analysis. Brezo and colleagues (2007) found that attempters and ideators reported comparable impulsivity on the Barratt Impulsiveness Scale (Barratt, 1985).

Furthermore, a recent study highlights our limited understanding of impulsivity in suicide. It is common in the suicide literature to differentiate between planned attempts and impulsive (i.e., unplanned) attempts. Intuitively, higher impulsivity would be expected to relate to performance of impulsive attempts. However, Witte and colleagues (2008) found that youth who reported impulsive attempts reported *fewer* impulsive behaviors such as impaired driving, substance use, and unprotected sex.

Careful consideration of conceptual and operational definitions of impulsivity may help explain the mixed and somewhat unexpected findings to date regarding the relationship of impulsivity to suicide. Personality and psychopathology researchers have come to view impulsivity as a broad, multidimensional construct. Whiteside and Lynam (2001) subjected multiple measures of impulsivity and related constructs to factor-analytic investigation, and identified four facets of personality that lead to impulsive behavior: (1) urgency, (2) lack of perseverance, (3) lack of premeditation, and (4) sensation seeking. Subsequent studies using both self-report and interview methodologies (Miller, Flory, Lynam, & Leukefeld, 2003; Smith et al., 2007) provide converging evidence for this model. The four facets are referred to by the acronym UPPS (Whiteside & Lynam, 2001). Urgency<sup>1</sup> assesses an individual's tendency to give in to strong impulses when experiencing intense negative emotions. Lack of perseverance assesses an individual's ability to persist in completing jobs or obligations despite

boredom or fatigue. Lack of premeditation assesses an individual's ability to think through the potential consequences of his or her behavior before acting. And sensation seeking measures an individual's preference for excitement and stimulation.

Importantly, UPPS dimensions exhibit different relationships to different disorders and maladaptive behaviors. For example, conduct disorder, antisocial personality, and substance use are best predicted by sensation seeking and lack of premeditation, whereas eating disorders and borderline personality are best predicted by urgency (Miller et al., 2003). To date, the UPPS model has helped clarify the nature of impulsivity in alcohol abuse (Whiteside & Lynam, 2003), ADHD (Miller et al., 2003), bulimia (Fischer, Smith, & Anderson, 2003), borderline personality disorder (Whiteside, Lynam, Miller, & Reynolds, 2005), depression (d'Acremont & van der Linden, 2007), and nonsuicidal self-injury (Glenn & Klonsky, 2010). The differential but theoretically consistent relationships between UPPS facets and different types of psychopathology support the model's convergent and discriminant validity. The UPPS model has clear potential for elaborating the role of impulsivity in suicide ideation and attempts, and for reconciling conflicting findings regarding the impulsivity-suicide relationship. Only one study to date (Yen et al., 2009) has applied the UPPS model of impulsivity to the study of suicide. Its authors found that all UPPS facets except for sensation seeking predict attempts, and that only lack of premeditation predicted attempts when controlling for negative affectivity. However, the authors did not compare impulsivity in attempters to impulsivity in ideators who had never made an attempt.

In the present study we evaluated the hypothesis that elevated impulsivity distinguishes individuals who have attempted suicide from those who have considered suicide but never attempted. Data on impulsivity and suicide history were obtained from three large nonclinical samples. Because only one previous study compared impulsivity in attempters and ideators, we conducted this

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1. This dimension has also been referred to as "negative urgency" (Cyders & Smith, 2007).

analysis in different samples using different measures of impulsivity. The first sample, drawn from a military population, was administered a unidimensional measure of impulsivity from the Schedule for Nonadaptive and Adaptive Personality (SNAP; Clark, 1996). The second and third samples, drawn from college and high school populations, were administered the multidimensional UPPS measure of impulsivity. IRB approval was obtained from all relevant institutions.

### SAMPLE 1

#### *Participants and Procedure*

The data analyzed were collected as part of a larger study on the peer assessment of pathological personality traits (Klonsky, Oltmanns, & Turkheimer, 2003; Oltmanns & Turkheimer, 2006; Thomas, Turkheimer, & Oltmanns, 2003). Participants were 2,011 U.S. military recruits (63% men) in basic training. The participants were enlisted personnel who would eventually receive assignments as military police, mechanics, computer technicians, or other supportive roles. Their mean age was 20 years ( $SD = 5$ ), mean IQ was 104, and 99% were high school graduates. Racial composition of the sample was 65% Caucasian, 17% African American, 4% Hispanic, 3% Asian, and 1% Native American, and 10% listed their race as Other. All participants completed a large battery of measures that included assessment of impulsivity, suicide ideation, and attempted suicide. After a complete description of the study was provided to participants, written informed consent was obtained. As part of the informed consent process, it was made clear that participation was optional and could be stopped at any point without penalty.

#### *Measures*

*Impulsivity.* All participants were administered the Schedule for Nonadaptive and Adaptive Personality (Clark, 1996). The SNAP is a factor-analytically derived, self-report questionnaire composed of 375 true/

false items designed to assess trait dimensions in the domain of personality pathology. For the present study the 19-item SNAP Impulsivity Scale was used to index impulsivity. The scale exhibited very good internal consistency ( $\alpha = .79$ ).

*Suicidal Ideation.* Three SNAP items, "sometimes I think suicide is the only way out of my troubles," "sometimes I think that trying to commit suicide is the only way to get people to take me seriously," and "I sometimes wonder if I would be better off dead," were used to measure suicide ideation. Participants endorsing any of these items were considered to have a history of suicide ideation.

*Attempted Suicide.* One SNAP item, "I have tried to commit suicide," was used to assess lifetime history of attempted suicide. Participants endorsing this item were considered to have a history of attempted suicide.

#### *Results*

Just over 91% of the sample ( $n = 1,836$ ) denied a history of suicidal ideation and attempts; 6.4% ( $n = 129$ ) endorsed a history of suicidal ideation but not attempts (ideators-only); and 2% ( $n = 46$ ) reported a history of attempted suicide (attempters). A one-way analysis of variance indicated that impulsivity scores differed significantly across the three groups,  $F(2,2008) = 24.6$ ,  $p < .001$ . Post-hoc Least Significant Difference tests were used to examine the source of these differences. Those who were never suicidal ( $M = 4.3$ ,  $SD = 3.5$ ) scored significantly lower than ideators-only ( $M = 6.3$ ,  $SD = 4.1$ ;  $p < .001$ ) and attempters ( $M = 5.9$ ,  $SD = 3.6$ ;  $p < .01$ ). However, impulsivity scores did not differ between attempters and ideators-only ( $p = .76$ ).

### SAMPLES 2 AND 3

#### *Participants and Procedure*

For Sample 2, a random sample of 5,000 fulltime undergraduates at a large public university in the northeastern United States were e-mailed an invitation to partici-

pate in a study on alcohol and drug use via a secure Internet Web site. The study included measures of impulsivity and suicide. Upon accessing the survey, students were provided with informed consent. Twenty-five percent completed the study measures, yielding a final sample of 1,296. The sample was 56% female, 43% Caucasian, 35% Asian, 7% African American, 9% Hispanic, and 7% from other ethnic categories. Ninety-seven percent of respondents were 18 to 24 years of age.

For Sample 3, 700 students at a large high school in the northeastern United States were invited to participate in a questionnaire study of "high-school mental health and well-being." Three-hundred ninety-nine students (57%) completed the study measures. The sample was approximately 61% female, 53% Caucasian, 19% Hispanic, 15% Asian, 11% African American, and 3% mixed racial heritage. Age ranged from 13 to 17 years. Parental permission and informed assent was obtained.

Because the same measures were administered to the high school and college samples, and because the proportion of participants in the nonsuicidal, ideator-only, and attempter groups did not differ between the high school and college samples,  $\chi^2(2) = 0.53$ ,  $p = .77$ , data from Samples 2 and 3 were combined for analysis and group status (i.e., college vs. high school) was examined as a potential moderator variable.

### Measures

*Impulsivity.* The UPPS impulsive behavior scale (Whiteside & Lynam, 2001) is a self-report measure of four distinct personality pathways to impulsive behavior: urgency, (lack of) perseverance, (lack of) premeditation, and sensation seeking (descriptions of the four pathways are provided above). The convergent, discriminant, and predictive validity of the UPPS model has been demonstrated by multiple investigators using multiple methodologies (d'Acremont & van der Linden, 2007; Fischer et al., 2003; Miller et al., 2003; Smith et al., 2007; Whiteside & Lynam, 2003; Whiteside et al., 2005). In the

present study we utilized the 16-item short-form of the UPPS. The short-form was developed by selecting the four items from each scale with the highest item loadings in the original study (Whiteside & Lynam, 2001). Internal consistencies for the UPPS were very good in the present study: alphas ranged between .76 and .81 for each of the four UPPS subscales. Intercorrelations among the subscales ranged from  $-.01$  to  $.45$  (median =  $.23$ ), suggesting that the subscales are not redundant.

*Suicidal Ideation and Attempted Suicide.* The Youth Risk Behavior Survey (YRBS) (Brenner et al., 2002) was developed by the U.S. Centers for Disease Control to assess health risk behaviors, including suicidality. A history of suicidal ideation is measured by the item: "Have you ever seriously thought about killing yourself?" A history of attempted suicide is measured by the item: "Have you ever tried to kill yourself?" YRBS suicide questions have been found to have good reliability (Brenner et al., 2002).

### Results

Just over 82% of the combined sample ( $n = 1,396$ ) denied a history of suicidal ideation and attempts; 11.7% ( $n = 199$ ) endorsed a history of suicidal ideation but not attempts; and 5.9% ( $n = 100$ ) reported a history of attempted suicide. Females were more likely than males to be in the ideator-only (13.2% of females to 9.7% of males) or attempter (7.0% to 4.4%) groups,  $\chi^2(2) = 11.3$ ,  $p < .01$ . The rates of suicidal thoughts and attempts reported by Samples 2 and 3 are similar to rates reported by other studies of high school and college students in the region (CDC, 2008; Whitlock, Eckenrode, & Silverman, 2006).

Analyses of variance were used to compare impulsivity scores across the three groups. Results are detailed in Table 1. Regarding the four UPPS facets, neither sensation seeking nor (lack of) perseverance differed among the three groups. Urgency was lower among those who had never been suicidal, but comparable between ideators-only

**TABLE 1**  
*Impulsivity-Related Traits in Relation to Suicidal Ideation and Attempts*

Scale	Not Suicidal ( <i>n</i> = 1,396)		Ideators ( <i>n</i> = 199)		Attempters ( <i>n</i> = 100)		Statistical Analysis	
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>	<i>F</i>	<i>p</i>
Urgency	9.4 <sup>a</sup>	2.8	10.3 <sup>b</sup>	2.7	10.6 <sup>b</sup>	3.1	19.2	<.001
Premeditation (lack of)	7.3 <sup>a</sup>	2.4	7.4 <sup>a</sup>	2.2	8.0 <sup>b</sup>	2.4	4.5	.01
Perseverance (lack of)	6.9 <sup>a</sup>	2.2	7.2 <sup>a</sup>	2.1	7.1 <sup>a</sup>	2.1	1.1	.33
Sensation Seeking	10.2 <sup>a</sup>	3.0	10.7 <sup>a</sup>	2.8	10.8 <sup>a</sup>	3.2	3.0	.05

*Note.* This table depicts results from one-way analyses of variance. For each row, means that do not share a superscript are significantly different using LSD post-hoc tests.

and attempters. Only (lack of) premeditation distinguished ideators-only from attempters, with attempters reporting poorer premeditation than ideators. A series of logistic regressions found that neither group status (i.e., college vs. high school) nor gender moderated the relationships of the four UPPS dimensions to histories of suicide ideation and attempts (details available upon request from the author).

Finally, a logistic regression was conducted to examine the unique contribution of UPPS facets to the prediction of suicidality. A three-level suicide variable—never suicidal, ideation only, attempt—was used as the dependent variable. Ideation was used as the reference level. The four UPPS facets were simultaneously entered into the regression. Results were consistent with those from the ANOVAs. Only elevated urgency distinguished ideators from those who had never been suicidal ( $p < .001$ ), but only lack of premeditation distinguished attempters from ideators ( $p < .03$ ).

## DISCUSSION

We examined trait impulsivity in relation to suicide ideation and attempts in three large nonclinical samples. Clinical models of suicide suggest that trait impulsivity increases the chances that suicidal thoughts will lead to suicidal behavior (Mann et al., 1999). Therefore, it was hypothesized that high impulsiv-

ity would distinguish individuals who have attempted suicide from those who have considered suicide but never made an attempt.

Our findings do not support the hypothesis, and suggest that multidimensional models of impulsivity are needed to explicate the link between impulsivity and suicide. Specifically, in a large sample of military recruits, a unidimensional measure of impulsivity (i.e., SNAP impulsivity scale) distinguished individuals with histories of *either* suicide attempts or suicide ideation only from those who had never been suicidal. However, comparable levels of impulsivity were reported by attempters and by ideators who had never attempted. Because the SNAP impulsivity scale exhibits empirical overlap with many aspects of impulsivity (Yen et al., 2009), it is not possible to determine from this finding alone whether all or just certain aspects of impulsivity fail to distinguish attempters from ideators.

The four-factor UPPS measure of impulsivity (Whiteside & Lynam, 2001) enabled a more fine-grained account of impulsivity in suicide. One dimension, urgency (the tendency to give in to strong impulses when experiencing intense negative emotions), performed similarly to the unidimensional measure of impulsivity. Elevated urgency differentiated those with histories of *either* suicidal thoughts or behavior from those who had never been suicidal. Because high urgency is associated with high neuroticism (Whiteside & Lynam, 2001), it is not surpris-

ing that this feature is found in both ideators and attempters. In contrast, another feature, low premeditation (a diminished ability to think through the consequences of one's actions), uniquely characterized suicide attempters. Attempters exhibited more pathological premeditation than those who had only considered suicide and those who had never been suicidal. The latter two groups reported comparable premeditation. It is also noteworthy that the impulsivity-related traits of sensation seeking and poor perseverance did not differ among participants with histories of attempts, ideation only, and without histories of suicidality.

These findings have practical and theoretical implications for understanding suicide risk. Suicide risk assessments are an important part of clinical assessment and treatment. Identifying patients at moderate and high risk for suicide helps prioritize treatment targets and implement necessary safety precautions. Impulsivity is one of a few psychological characteristics consistently highlighted in guidelines for conducting suicide assessments and determining level of risk (Bryan & Rudd, 2005; Joiner et al., 1999). Results from the present study suggest that a particular trait, the diminished ability to think through the consequences of one's behavior before acting, confers risk for suicidal behavior over and above the presence of suicidal thoughts. Because many psychiatric patients experience suicidal ideation (Asnis et al., 1993), this aspect of impulsivity may carry extra importance in suicide risk assessments.

More broadly, results from the present study suggest the potential benefits of utilizing the UPPS multidimensional model of impulsivity in suicide research. As noted earlier, research on the relationship of impulsivity to suicide has yielded mixed results, with many studies reporting a link (Brodsky et al., 1997; Kingsbury et al., 1999; Mann et al.,

1999; Nock & Kessler, 2006) and others reporting no relationship (Horesh, 2001; Keilp et al., 2006; Oquendo et al., 2000). One explanation for these mixed findings is that previous studies have utilized broad measures of impulsivity that insufficiently differentiate among distinct pathways toward impulsive behavior. Utilizing the UPPS model of impulsivity may help develop more consistent, sophisticated, and clinically useful models of impulsivity in suicide.

Several limitations of this study should be noted. First, this study utilized large non-clinical samples of adults and adolescents. Future studies should determine if findings replicate in other samples, including those drawn from clinical and geriatric populations. Second, the response rate of 25% in Sample 2 (college students) is low. Lower response rates can raise concerns about generalizability of results to nonrespondents. In the present study these concerns are somewhat ameliorated because the pattern of findings generalized across multiple samples. Third, due to the retrospective nature of the data there is the possibility that prior suicidal experiences are reflected in the impulsivity scores. This is a common concern in the suicide literature as there are few prospective studies; such studies could establish the temporal relationship between reports of impulsivity and suicidality. Finally, a short-form of the UPPS impulsive behavior scale was utilized rather than the full version. Short versions have the advantage of facilitating data collection from large samples, which in turn facilitates examination of low base-rate behaviors such as attempted suicide. At the same time, using the full version would increase reliability of measurement, and thereby more precisely estimate the relationships of UPPS dimensions to suicidal thoughts and behaviors.

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