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What is This?
Reconsidering the Link Between Impulsivity and Suicidal Behavior

Michael D. Anestis1, Kelly A. Soberay2,3, Peter M. Gutierrez2,3,4, Theresa D. Hernández4, and Thomas E. Joiner2,5

Abstract
It is widely accepted that suicidal behavior often occurs with little planning. We propose, however, that suicidal behavior is rarely if ever impulsive—that it is too frightening and physically distressing to engage in without forethought—and that suicidal behavior in impulsive individuals is accounted for by painful and fearsome behaviors capable of enhancing their capacity for suicide. We conducted a meta-analysis of the association between trait impulsivity and suicidal behavior and a critical review of research considering the impulsiveness of specific suicide attempts. Meta-analytic results suggest the relationship between trait impulsivity and suicidal behavior is small. Furthermore, studies examining a mediating role of painful and provocative behaviors have uniformly supported our model. Results from our review suggest that researchers have been unable to adequately measure impulsivity of attempts and that measures sensitive to episodic planning must be developed to further our understanding of this phenomenon.

Keywords
suicide, impulsivity, acquired capability

Suicide is a global concern, resulting in the annual deaths of approximately one million individuals worldwide (National Institute of Mental Health, 2008). With this in mind, researchers have devoted substantial attention to the identification of risk factors for suicidal behavior. This work has yielded a growing list of variables linked to risk, including hopelessness (e.g., Beck, Steer, Kovacs, & Garrison, 1985), depression (e.g., Bostwick & Pankratz, 2000), non-suicidal self-injury (NSSI; Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006), thwarted belonging, and perceived burdensomeness (Joiner, 2005). Although the mechanisms through which these variables are thought to confer risk for suicidal behavior are often delineated and supported by empirical associations, this is not always the case. One variable for which this is noteworthy is impulsivity, which has been reported to be associated with suicidal behavior across a large number of studies (e.g., Dougherty et al., 2004).

Impulsivity is a broad construct defined and measured differently across investigations (Lynam & Miller, 2004). Definitions vary in emphasis, with some focusing on the act of engaging in risky behavior (e.g., Barratt, 1993), some focusing on the tendency to opt for smaller immediate rewards over longer term larger rewards (e.g., Bickel & Marsch, 2001), and some emphasizing the importance of specific affective states as influences over an individual’s ability to inhibit sudden drives to engage in problematic behaviors (e.g., Whiteside & Lynam, 2001). Across theories, the construct of impulsivity is typically thought to involve several subcomponents (e.g., negative urgency, deficits in planning), nearly all of which involve a tendency to act without forethought (sensation seeking and lack of perseverance may represent exceptions; e.g., Whiteside & Lynam, 2001).

Several theories have been proposed to explain the mechanisms through which impulsivity might be associated with suicidal behavior. Virtually all of these include reference to a distal role for impulsivity but also posit a proximal relationship in which impulsivity explains the nature of the behavior itself. For instance, some researchers posit that the relationship is best thought to represent impulsive-aggression, a tendency to aggress toward others or oneself in response to acute stress (e.g., Mann & Currier, 2009). Consistent with this approach, some have proposed that deficient serotoninergic neurotransmission, represented by low cerebrospinal fluid 5-hydroxyindolacetic acid (CSF-5HIAA) levels, explains the relationship (e.g., Rifai, Reynolds, & Mann, 1992); however, empirical evaluations of this

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conceptualization have not been consistently supportive (e.g., Roggenbach, Muller-Oerlinghausen, & Franke, 2002).

Relatedly, Baumeister (1990) proposed that suicide attempts represent an escape from aversive self-awareness and that individuals develop a diminished ability to resist impulses to engage in suicidal behavior while experiencing such a state and, as a result, become increasingly at risk for engaging in such behavior impulsively. Similarly, some believe that impulsivity serves as the diathesis in a diathesis-stress model in which stressors such as negative life events might interact with impulsivity to result in rash efforts to enact lethal self-harm (e.g., Mann, Wateraux, Haas, & Malone, 1999). In this conceptualization, suicidal behavior is viewed as a frequently unplanned behavioral response to momentary aversive experiences, more likely to occur in individuals who display a general tendency to act without forethought. Indeed, in explaining the role of impulsivity in suicidal behavior, Mann et al. (1999) noted that, due to their propensity toward impulsive action, suicide attempters “feel more suicidal and are more likely to act on feelings” (p. 186). Implicit in such a statement is the notion that suicidal behavior often emerges explosively in response to affect in people who are less capable of inhibiting rash responses to sudden urges. In addition, the same researchers proposed that planning and impulsive action are not mutually exclusive, stating that “the decision to act on a careful plan may be impulsive” (Mann et al., 1996, p. 582). This raises questions regarding the definition of impulsivity, as a decision to act on a plan previously developed in great depth seems to directly contrast many common conceptualizations of the construct (e.g., Whiteside & Lynam, 2001). In this review, the focus is on conceptualizations of impulsivity that emphasize the tendency to act without forethought.

A theme across each of the theories just described is the notion that people often engage in suicidal behavior without significant planning and that suicide attempts are often fueled by intense affective states. Indeed, the notion that suicidal behavior frequently occurs with little to no forethought is regularly noted as a statement of fact in literature reviews. For instance, Jeon and colleagues (2010) cited a number of studies detailed later in this review, noting that “with respect to the literature, studies have consistently reported that a considerable proportion of suicidal attempts are unplanned” (p. 275). Inherent in this viewpoint is the belief that suicidal behavior frequently occurs without any detectable progression from low to imminent risk. This supposition has obvious implications with respect to our understanding of risk factors related to imminent suicidal behavior and the role of clinicians in identifying and mitigating risk (A. R. Smith et al., 2008).

If an individual can engage in suicidal behavior without prior consideration, this speaks to the notion that momentary affective and/or cognitive states are capable of overcoming what many would argue is a fundamental component of human nature and an evolutionary imperative: the relentless will to remain alive (Joiner, 2010). Should such models prove untrue, however, the implication would be that, to override the drive to survive, an individual would need to chip away at it over time. In this article, we present an alternative model that argues that little, if any, suicidal behavior—lethal or non-lethal—occurs without substantial planning. Although further research testing important components of this model is needed, we argue that every effort to test it thus far has been supportive, whereas evidence that purportedly supports models proposing suicidal behavior is frequently impulsive is problematic.

The prominence of models that describe suicidal behavior as frequently impulsive is perhaps best seen through the frequent (and highly cited) efforts to measure impulsive suicidal behavior (e.g., Conner et al., 2007; de Leo, Cerin, Spathonis, & Burgis, 2005; Mann et al., 1996). Such studies have typically approached the association from one of two angles: the trait impulsivity of the individual or the degree to which specific acts of suicidal behavior were engaged in impulsively. We argue that the nature of the measures and the designs used in such investigations have precluded researchers from directly testing models that propose that suicidal behavior is frequently impulsive (see Figure 1a). Furthermore, we believe interpretations of published data have resulted in erroneous conclusions. In addition, we argue that a failure to consider plausible alternative models fully has fueled the belief that suicidal behavior frequently occurs impulsively. The purpose of this review is to consolidate findings, discuss their implications and limitations, and propose a new theoretical framework from which to consider the relationship between impulsivity and suicidal behavior (see Figure 1b).

To accomplish these goals, our article is divided into three separate sections. In the first section, we provide a meta-analysis that examines the strength of the relationship between trait impulsivity and suicidal behavior. We anticipate that this relationship will be small in magnitude, thereby highlighting the point that a general tendency to act impulsively is unlikely a central component of suicidal behavior. This analysis represents a critical first step in considering the relationship between impulsivity and suicidal behavior and the results could place the magnitude of this association into a clearer context. In the second section, we provide a critical review of literature examining the impulsiveness of specific suicide attempts. We show that the general pattern of findings reveals inconsistent definitions of impulsive suicidal behavior, problematic measurements of planning, and a pattern of results incompatible with the notion that suicidal behavior frequently occurs without extensive planning. In the final section of the article, we provide a description of our alternative conceptualization of the association between impulsivity and suicidal behavior and the empirical evidence underlying that conceptualization.
Meta-Analytic Review of Trait Impulsivity Findings

Study Selection

Trait impulsivity findings were reviewed meta-analytically. The inclusion criteria were the use of both a measure of suicidal behavior (e.g., non-lethal attempts; death by suicide) and impulsivity. Furthermore, results directly testing an association between impulsivity and suicidal behavior must have been included in the published manuscript. Studies that examined only suicidal ideation or suicide risk or which did not clearly differentiate suicidal behavior from other related variables (e.g., ideation, NSSI) were excluded. Using 53 databases (e.g., Pubmed, PsycInfo), we entered the search terms suicide, suicidal behavior, impulsivity, and impulsive (these same search terms were used to develop our systematic review). After examining the measures utilized in each study, we eliminated any that did not fit our criteria. At that point, we examined each study and excluded any that used our required measures (a measure of trait impulsivity and suicidal behavior) but did not provide results that tested an association between them. In an effort to ensure that our outcome variable was not overly broad, we restricted the studies in the meta-analysis to those that examined the presence/absence of suicidal behavior or frequency of suicidal behavior.

Studies examining characteristics of suicidal behavior (e.g., medical lethality) were excluded. (Results from these and all other trait impulsivity studies, including which measure(s) was used, the nature of the study sample, and the size of the effect(s), can be found in the online Appendix). See Figure 2 for a description of the study selection process.

Data Extraction

For each study, data relevant for our meta-analysis were retrieved from the original study and entered into the statistical software (described below). When available, the mean and standard deviation for trait impulsivity and sample size for each group (suicidal behavior vs. no suicidal behavior) was recorded for each effect in each study. When such data were not available, odds ratios with 95% confidence intervals, p values with total sample size, or Cohen’s d with sample size were recorded and imputed into the meta-analysis software.

Statistical Analysis

Data were analyzed using Comprehensive Meta-Analysis (CMA) 2.0 statistical software (Borenstein, Hedges, Higgins, & Rothstein, 2005). Hedges g was utilized to calculate the standardized mean difference on suicidal behavior outcomes.

Figure 1. Two models of the relationship between impulsivity and suicidal behavior.

Note. In both models, impulsivity is defined as a tendency to act without forethought. Model a: In this more traditionally proposed model, impulsivity is a proximal risk factor, serving as a force or pressure and as such immediately precedes suicidal behavior in response to stress and/or aversive self-awareness (e.g., Baumeister, 1990; Mann, Waternaux, Haas, & Malone, 1999). In this model, there is a narrow window of opportunity and limited targets of opportunity (e.g., impulsivity immediately preceding suicidal behavior). This narrowness serves as an obstacle to clinical interventions aimed at reducing suicide risk and related behaviors. Model b: In this model, impulsivity is a trait that plays a facilitative role in other behaviors (i.e., painful or provocative events), which result in acquired capability. In this model, there is a larger window of opportunity and more targets for interventions aimed at reducing suicide risk and behaviors.
and we adhered to Cohen’s (1988) description of small ($g = .2$), medium ($g = .5$), and large ($g = .8$) effects. Several studies included multiple effects based on different measures of impulsivity. Some meta-analysis experts have argued that, in such situations, the proper approach is to choose one representative effect from each study to avoid artificially inflating the weight of any study through consideration of inter-related effects (e.g., Cooper, 1998). Others, however, have argued that multiple effects from the same study can be included if authors believe or have evidence to support the possibility that the effects are entirely or almost entirely unrelated to one another (e.g., Gliner, Morgan, & Harmon, 2003). A third approach is to compute a mean effect size across effects within each study and then include only the grand mean value for each (e.g., Connor, Glatt, Lopez, Jackson, & Melloni, 2002). We opted to utilize one effect from each sample, as this appeared to be the most conservative approach and represented the most stringent challenge to our hypothesis (e.g., a single effect from a more psychometrically sound measure may yield a larger effect, which would contradict our hypothesis). As a result, our findings represent analyses based on unique samples (e.g., participants were not represented multiple times across individual studies; see Table 1).

For studies in which one effect was selected from among several, we made an effort to select the effect that was most representative of the central tendency. In studies in which multiple self-report measures were utilized, we selected the Barratt Impulsiveness Scale (BIS; Patton, Stanford, & Barratt, 1995). Although this might cause the analysis to only reflect one of several conceptualizations of impulsivity, the BIS is by far the most frequently utilized measure in such studies (see online Appendix) and, as such, the analysis would also be the most representative of the literature as it is. Furthermore, analyses focused on any other self-report measure would be underpowered, thereby raising questions regarding the validity of the findings. In studies in which multiple behavioral measures were utilized, we selected the Immediate Memory Task (IMT; Dougherty, Marsh, & Mathias, 2002), as it appeared to maintain the most consistent relationship with suicidal behavior. If these measures were not utilized, we selected the largest effect in an effort to ensure that selections did not artificially weigh results in a direction that might be perceived as consistent with our model (e.g., decreasing the magnitude of the effect across studies). In studies in which both self-report and behavioral measures were used, we selected a behavioral measure based on the assumption that performance on such tasks avoids the drawbacks of self-report (e.g., lack of insight), thereby offering greater construct validity. In addition, in studies in which multiple diagnostic groups were represented (e.g., bipolar disorder and depression), we selected what we deemed to be the more clinically severe diagnostic group (e.g., bipolar disorder). Finally, when one study reported multiple effects on the same measure from multiple comparisons (e.g., multiple

![Figure 2. Flow chart for studies included and excluded from meta-analysis.](image-url)
Results

All meta-analytic results are presented in Table 1. In our analysis, considering only one effect per study (n = 57), the Q-test was significant (684.82) and the $I^2$ value (89.78) indicated a substantial amount of that variability was due to heterogeneity rather than chance. The test of the null was significant, and the effect size was small (Hedges $g = .34$, 95% confidence interval [CI] = [.24, .40], $p < .001$). There was no evidence that publication bias significantly impacted our results.

When considering only cross-sectional effects (n = 57), the Q-test was significant (500.89) and the $I^2$ value (88.82) indicated a substantial amount of that variability was due to heterogeneity rather than chance. For cross-sectional effects, the test of the null was significant and the effect size was small (Hedges $g = .37$, 95% CI = [.29, .46], $p < .001$). There was no evidence that publication bias significantly affected our results.

In the analysis including only prospective effects (n = 7), the Q-test was non-significant (9.50), indicating homogeneity across effect sizes. The test of the null was significant and the effect size was small (Hedges $g = .09$, 95% CI = [.02, .17], $p = .015$). There was no evidence that publication bias significantly affected our results.

In our analysis considering only psychological autopsy effects (n = 7), the Q-test was significant (121.12) and the $I^2$ value (95.05) indicated a substantial amount of that variability was due to heterogeneity rather than chance. The test of the null was non-significant ($p = .17$) and the effect size was small (Hedges $g = .30$, 95% CI = [−.13, .72], $p = .42$). There was no evidence that publication bias significantly affected our results.

Discussion of the Meta-Analytic Review

The results indicate that, when considering trait impulsivity and suicidal behavior in general, the relationship is significant but small in magnitude. This result mirrors those from studies that specifically differentiated individuals who have and have not engaged in previous non-lethal suicidal behavior (cross-sectional) and studies that specifically differentiated between individuals who do or do not engage in suicidal behavior during a follow-up period (prospective). In psychological autopsy samples, however, where investigators attempt to differentiate between suicide decedents and living controls, the relationship is not statistically significant, indicating that trait impulsivity is not a reliable method by which to differentiate those who have and have not died by suicide. It is particularly difficult to reconcile this last point with models that conceptualize lethal self-harm as often being impulsive. To put such findings into context, other meta-analyses have found at least moderate effect sizes for the relationship between suicidal behavior and posttraumatic stress disorder, depressed mood, hopelessness, family history of suicide, and prior suicide attempts (e.g., Large, Smith, Sharma, Nielsens, & Singh, 2011; Panagioti, Gooding, & Tarrier, 2012). Other meta-analyses have found moderate effect sizes between components of impulsivity and pediatric weight status, bulimia nervosa, and problematic alcohol use (e.g., Stautz & Cooper, 2013; Thamotheran, Lange, Zale, Huffhines, & Fields, 2013). Exhibiting a less robust

Table 1. Results From Meta-Analyses Examining the Magnitude of the Association Between Trait Impulsivity and Suicidal Behavior.

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Type of study</th>
<th>$g$</th>
<th>CI</th>
<th>$z$</th>
<th>$p$</th>
<th>$Q$</th>
<th>$I^2$</th>
<th>$k$</th>
<th>$df$</th>
<th>FSN</th>
<th>FS Z</th>
<th>FS $p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>RE</td>
<td>I effect per study</td>
<td>.34</td>
<td>[24.4, 40]</td>
<td>9.75</td>
<td>&lt;.001</td>
<td>684.82</td>
<td>.89</td>
<td>71</td>
<td>70</td>
<td>6,022</td>
<td>18.16</td>
<td>0.000</td>
</tr>
<tr>
<td>RE</td>
<td>Cross-sectional</td>
<td>.37</td>
<td>[29.4, 46]</td>
<td>8.89</td>
<td>&lt;.001</td>
<td>500.89</td>
<td>.88</td>
<td>57</td>
<td>56</td>
<td>4,031</td>
<td>16.60</td>
<td>0.000</td>
</tr>
<tr>
<td>RE</td>
<td>Prospective</td>
<td>.09</td>
<td>[02.17]</td>
<td>2.43</td>
<td>.015</td>
<td>36.83</td>
<td>9.50</td>
<td>7</td>
<td>6</td>
<td>17</td>
<td>3.59</td>
<td>0.003</td>
</tr>
<tr>
<td>RE</td>
<td>Psychological autopsy</td>
<td>.30</td>
<td>[−.13, .72]</td>
<td>1.36</td>
<td>.17</td>
<td>121.12</td>
<td>95.05</td>
<td>7</td>
<td>6</td>
<td>80</td>
<td>6.88</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Note. $g$, $p$, $Q$, $I^2$, $k$, $df$, FSN, Z, CI = 95% confidence interval; FSN = fail safe n; FS Z = Z test for Classic Fail Safe Test; FS $p = p$ value for Classic Fail Safe Test; RE = random effects model; I effect per study = one effect selected from any study with more than one effect reported.

*Denotes heterogeneity test was significant.
relationship with suicidal behavior than the above-mentioned risk factors does not render the relationship between trait impulsivity and suicidal behavior meaningless, but it certainly calls into question its centrality. Indeed, our central thesis is not that trait impulsivity is irrelevant to suicidal behavior but rather that the relationship is indirect and distal.

**Critical Review of Studies Examining Impulsivity of Attempts**

In this section, we provide a critical review of findings from studies examining the impulsiveness of specific suicide attempts. We opted against using a meta-analysis in this section because such analyses measure the average strength of the relationship between two variables and the focus of this portion of the article was on the measurement and conceptualization of the impulsivity of attempts. In this sense, there was no second variable to which impulsivity of attempts was being compared. As noted earlier in the article, we anticipated that this review would yield an inconsistent definition of impulsivity of attempts, problematic measurement approaches, and a pattern of results that does not align well with the notion that suicidal behavior frequently occurs without extensive planning.

**Study Selection**

Inclusion criteria for studies examined in our critical review involved reporting of any results intended to measure the extent to which participants engaged in suicidal behavior that involved little to no planning. In some studies, the assessment approach involved the use of a measure designed to assess impulsiveness of attempts. In other cases, this included the interpretation of objective circumstances (e.g., distance of attempt from home) or involved one or more questions from within a broader measure. These criteria yielded 49 studies (see Table 2).

**Summary of Results of Studies Examining the Impulsiveness of Specific Suicide Attempts**

In studies that examined the impulsivity of specific suicide attempts, the general trend appears to indicate that attempts that involve less planning are associated with less severe outcomes. For instance, in a sample of individuals hospitalized for a suicide attempt, Baca-Garcia and colleagues (2001) found that impulsiveness of attempt was inversely associated with lethality of attempt. Similarly, in a sample of adult inpatients diagnosed with depression who had attempted suicide at least once, Nakagawa and colleagues (2009) found that less planning was associated with lower lethality. In addition, in a sample of 673 attempters, Conner and colleagues (2006) found that greater levels of planning were associated with greater lethality. The inverse relationship between impulsiveness of attempt and lethality of attempt has also been replicated in a sample of adolescents (Witte et al., 2008).

Studies examining the association between impulsiveness of attempts and psychopathology also fail to support the view that suicidal behavior is frequently impulsive. Across a variety of samples, more impulsive attempts were associated with lower depression scores (e.g., Brown, Overholser, Spirito, & Fritz, 1991; Conner et al., 2006; Jeon et al., 2010; Nakagawa et al., 2009; Simon et al., 2001; Soloff, Lynch, Kelly, Malone, & Mann, 2000; Suominen, Isometsa, Henriksson, Ostamo, & Lonnqvist, 1997; Wojnar et al., 2009; Wyder & de Leo, 2007; see Conner et al., 2007 and Giegling et al., 2009 for null findings). Similarly, Wojnar et al. (2009) found that impulsive attempters were less likely to report a family history of suicide or having experienced childhood sexual abuse, and Conner et al. (2006) reported that impulsive attempters were less likely to meet diagnostic criteria for substance dependence. Given that depression (e.g., Bostwick & Pankratz, 2000), substance use (Bagge & Sher, 2008), and a history of childhood sexual abuse (e.g., Joiner et al., 2007) are associated with severe suicidal behavior, these findings are evidence that individuals in particularly high-risk groups are less likely to engage in impulsive attempts. When considered within the context of these findings, models claiming suicidal behavior frequently occurs impulsively are particularly problematic, as such perspectives seem to suggest that a large proportion of attempts involve individuals with lower levels of psychopathology and fewer risk factors for severe, repeated, and lethal suicidal behavior.

**Conceptual Issues With Studies Examining the Impulsiveness of Specific Suicide Attempts**

Studies that examine impulsiveness of attempts differ in many ways, including the method of measurement and the proportion of attempts considered impulsive. In studies that dichotomized attempts as impulsive or non-impulsive, the proportion of attempts considered impulsive has ranged from 13% (Houston, Hawton, & Sheppard, 2001) to 97% (Razin et al., 1991). As such, there does not appear to be a consensus as to whether impulsive suicidal behavior is a rare phenomenon or representative of the vast majority of attempts. As we argue in greater detail below, we believe the actual proportion of attempts that can accurately be described as impulsive to be at or very close to 0%.

One explanation for this large discrepancy is likely the inconsistent operationalization of the time frame during which an individual must report having thoughts about attempting suicide. In some studies, participants are asked if they contemplated their attempt for longer than 15 min prior to attempting (e.g., Hawton, Kingsbury, Steinhardt, James, & Fagg, 1999). In others, the time frame ranges from ‘none;
Table 2. Results From Studies Examining Impulsivity of Attempts.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Measure of impulsivity</th>
<th>Attempt sample</th>
<th>% Impulsive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baca-Garcia et al. (2001)</td>
<td>2-item SIS</td>
<td>478 attempters</td>
<td>55.0</td>
</tr>
<tr>
<td>Baca-Garcia et al. (2005)</td>
<td>8-item SIS</td>
<td>242 attempters</td>
<td>76.0</td>
</tr>
<tr>
<td>Bagge, Glenn, and Lee (2013)</td>
<td>2-item SIS</td>
<td>110 attempters</td>
<td>46.0</td>
</tr>
<tr>
<td>Brown, Overholser, Spirito, and Fritz (1991)</td>
<td>2-item SIS</td>
<td>86 adolescent attempters</td>
<td>66.3</td>
</tr>
<tr>
<td>Chen et al. (2007)</td>
<td>8-item SIS</td>
<td>148 suicide decedents</td>
<td>—</td>
</tr>
<tr>
<td>Chesin, Jeglic, and Stanley (2010)</td>
<td>8-item SIS</td>
<td>40 BPD attempters</td>
<td>—</td>
</tr>
<tr>
<td>Conner et al. (2005)</td>
<td>7-item SIS</td>
<td>505 suicide decedents</td>
<td>32.0</td>
</tr>
<tr>
<td>Conner et al. (2006)</td>
<td>Unpublished interview</td>
<td>673 attempters</td>
<td>51.0</td>
</tr>
<tr>
<td>Conner et al. (2007)</td>
<td>7-item SIS</td>
<td>117 depressed attempters aged 50+</td>
<td>—</td>
</tr>
<tr>
<td>Connell et al. (2002)</td>
<td>Presence of loaded and/or unlocked guns in home</td>
<td>50 suicide decedents aged 50+</td>
<td>—</td>
</tr>
<tr>
<td>de Leo, Cerin, Spathonis, and Burgis (2005)</td>
<td>Method unspecified</td>
<td>399 attempters</td>
<td>—</td>
</tr>
<tr>
<td>Deisenhammer et al. (2009)</td>
<td>Unnamed number of SIS items</td>
<td>82 attempters</td>
<td>47.6</td>
</tr>
<tr>
<td>Dombrovski et al. (2011)</td>
<td>7-item SIS</td>
<td>29 depressed attempters aged 60+</td>
<td>—</td>
</tr>
<tr>
<td>Fazaa and Page (2011)</td>
<td>2-item SIS</td>
<td>96 undergraduate attempters</td>
<td>—</td>
</tr>
<tr>
<td>Giegling, Hartsmann, Moller, and Rujescu (2006)</td>
<td>Unnamed number of SIS items</td>
<td>203 attempters</td>
<td>59.1</td>
</tr>
<tr>
<td>Giegling et al. (2007)</td>
<td>Unnamed number of SIS items</td>
<td>167 attempters + 92 decedents</td>
<td>61.0</td>
</tr>
<tr>
<td>Giegling et al. (2008)</td>
<td>Unnamed number of SIS items</td>
<td>144 attempters</td>
<td>60.5</td>
</tr>
<tr>
<td>Giegling et al. (2009)</td>
<td>Unnamed number of SIS items</td>
<td>111 attempters</td>
<td>58.6</td>
</tr>
<tr>
<td>Hall, Platt, and Hall (1999)</td>
<td>Unstructured interview</td>
<td>100 “severe” attempters</td>
<td>—</td>
</tr>
<tr>
<td>Hawton, Kingsbury, Steinhards, James, and Fagg (1999)</td>
<td>1 item SIS</td>
<td>45 adolescents hospitalized for intentional overdose</td>
<td>83.3 multiple attempters; 70.4 first time attempters</td>
</tr>
<tr>
<td>Houston, Hawton, and Sheppard (2001)</td>
<td>Inquest notes</td>
<td>27 suicide decedents</td>
<td>13.0</td>
</tr>
<tr>
<td>Huan et al. (2004)</td>
<td>2-item SIS</td>
<td>100 attempters</td>
<td>26.0</td>
</tr>
<tr>
<td>Jeon et al. (2010)</td>
<td>Unpublished interview</td>
<td>208 attempters</td>
<td>36.0</td>
</tr>
<tr>
<td>Langhinrichsen-Rohling and Larrs (2008)</td>
<td>“Suicide interview”</td>
<td>39 youth attempters</td>
<td>83.0</td>
</tr>
<tr>
<td>Mann and Malone (1997)</td>
<td>8-item SIS</td>
<td>22 depressed attempters</td>
<td>—</td>
</tr>
<tr>
<td>Mann et al. (1992)</td>
<td>“First part” of SIS</td>
<td>53 attempters</td>
<td>66.7</td>
</tr>
<tr>
<td>Mann et al. (1996)</td>
<td>8-item SIS</td>
<td>49 attempters</td>
<td>—</td>
</tr>
<tr>
<td>Miranda et al. (2008)</td>
<td>Adolescent suicide interview</td>
<td>79 attempters</td>
<td>—</td>
</tr>
<tr>
<td>Nakagawa et al. (2009)</td>
<td>8-item SIS</td>
<td>151 depressed attempters</td>
<td>—</td>
</tr>
<tr>
<td>Nock et al. (2008)</td>
<td>WHO: CIDI</td>
<td>5,017 attempters</td>
<td>—</td>
</tr>
<tr>
<td>O’Donnell, Farmer, and Catalan (1996)</td>
<td>Unnamed number of SIS items</td>
<td>20 attempters who had jumped in front of a train</td>
<td>—</td>
</tr>
<tr>
<td>Raja and Azzoni (2004)</td>
<td>Unpublished questionnaire</td>
<td>80 attempters</td>
<td>48.8</td>
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<tr>
<td>Razin et al. (1991)</td>
<td>Unstructured interview</td>
<td>33 female adolescent attempters</td>
<td>97.0</td>
</tr>
<tr>
<td>Serreti et al. (2007)</td>
<td>Unnamed number of SIS items</td>
<td>167 attempters</td>
<td>61.0</td>
</tr>
<tr>
<td>Simon et al. (2001)</td>
<td>Unpublished interview</td>
<td>153 “nearly lethal” attempters</td>
<td>24.0</td>
</tr>
<tr>
<td>Soloff, Lynch, Kelly, Malone, and Mann (2000)</td>
<td>8-item SIS</td>
<td>92 attempters</td>
<td>—</td>
</tr>
<tr>
<td>Spokes, Wenzel, Brown, and Beck (2012)</td>
<td>1-item SIS</td>
<td>143 attempters</td>
<td>43.3</td>
</tr>
<tr>
<td>Stanley, Gameroff, Michalsen, and Mann (2001)</td>
<td>Unnamed number of SIS items</td>
<td>53 attempters</td>
<td>—</td>
</tr>
<tr>
<td>Suominen, Isometts, Henriksson, Ostamo, and Lonnqvist (1997)</td>
<td>2-item SIS</td>
<td>114 attempters</td>
<td>44.0</td>
</tr>
<tr>
<td>Verkes et al. (1998)</td>
<td>8-item SIS</td>
<td>144 attempters</td>
<td>—</td>
</tr>
<tr>
<td>Westheide et al. (2008)</td>
<td>8-item SIS</td>
<td>29 depressed attempters</td>
<td>—</td>
</tr>
<tr>
<td>Weyrauch, Roy-Byrne, Katon, and Wilson (2001)</td>
<td>3-item SIS</td>
<td>99 attempters</td>
<td>—</td>
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<tr>
<td>Williams, Davidson, and Montgomery (1980)</td>
<td>Unpublished interview</td>
<td>350 attempters</td>
<td>40.4</td>
</tr>
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<td>Wisse et al. (2008)</td>
<td>Unpublished interview</td>
<td>5,979 attempters</td>
<td>20.0</td>
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<tr>
<td>Wojnar et al. (2008) and Wojnar et al. (2009)</td>
<td>Unpublished interview</td>
<td>154 alcohol dependent attempters</td>
<td>62.0</td>
</tr>
<tr>
<td>Wyder and de Leo (2007)</td>
<td>Unpublished interview</td>
<td>112 attempters</td>
<td>26.0</td>
</tr>
</tbody>
</table>

Note. — = Author(s) did not dichotomize suicide attempts as impulsive/non-impulsive; SIS has been utilized using 1 item (premeditation), 2 items (also includes active preparation), 3 items (also includes suicide note), 7 items (also includes isolation, timing, precautions against discovery, final acts in anticipation of death), and 8 items (also includes discussions of thoughts/plans with others). SIS = Suicide Intent Scale; BPD = borderline personality disorder; WHO: CIDI = World Health Organization Composite International Diagnostic Interview.
impulsive” (e.g., Brown et al., 1991) to less than 30 min (e.g., Wojnar et al., 2008), to less than 7 consecutive days prior to the attempt (e.g., Conner et al., 2006). Others consider the use of easily accessible means or locations close to home as evidence of impulsivity (e.g., Conwell et al., 2002; O’Donnell, Farmer, & Catalan, 1996). The use of close proximity to home is an indicator of an impulsive attempt is particularly problematic. O’Donnell and colleagues (1996) noted that the vast majority of attempts in their sample of 20 attempters who survived jumping in front of a train occurred at the station nearest to the attempter’s home and concluded that these attempts were thus impulsive. Inherent in this viewpoint is the notion that planning a suicide attempt is positively correlated with distance from home, a point that lacks a clear rationale.

We contend that the very nature of suicidal behavior is such that little to none of it can truly be conceptualized as impulsive. Although people engage in suicidal behavior for many reasons, they likely boil down to finding a solution to a very serious problem (e.g., ending unbearable psychological pain; Jobes, 2006), which requires effortful thought. Thus, for suicidal behavior to be impulsive, it must occur in the absence of prior planning outside the moments and hours immediately preceding the behavior (i.e., consideration of methods and selecting the one to use). Even if the bulk of the planning occurs sporadically over an extended period long before the attempt and minimally or not at all immediately prior to the attempt, then the behavior should not be labeled impulsive. We are proposing a distinction that accounts for the intention of the behavior. To inflict serious enough self-harm to risk death, people must give very careful thought to what they are going to do and how they are going to do it. A counter-argument could be made that picking up a gun, pointing it at the body, and pulling the trigger does not require much planning and has a high probability of resulting in death without causing pain. In this sense, the boundary typically presented by overcoming pain and a potentially lengthy experience of pain is removed. However, the prospect of shooting oneself nonetheless involves overcoming the fear of death and massive bodily harm and, as such, we believe an individual could impulsively decide to pick up a gun, but would be unable to pull the trigger without enough rehearsal (mental and/or physical) and planning to diminish those fears.

**Obstacles in Studies Examining Impulsivity of Attempts**

Further complicating the conceptualization of impulsivity as it applies to suicidal behavior is a tendency for studies to refer to some attempts as impulsive regardless of previous ideation or planning. For instance, 51% of attempts in a study by Conner and colleagues (2006) were considered impulsive despite the fact that 58% of attempters indicated that they had developed a suicide plan prior to their attempt. This finding could indicate that some individuals spend extensive periods of time planning but experience intermittent periods of ideation. In this scenario, an extensively planned attempt may be preceded by a period of mild or even no ideation. In this sense, the findings would be driven by the fact that individuals are asked to consider only the moments immediately prior to an attempt, without noting the possibility that their thoughts developed over time and were episodic in nature. Indeed, de Leo et al. (2005) found that, in a sample of 11,572 participants responding to a telephone survey, only 20% of individuals with a prior history of suicidal behavior experienced risk as a phenomenon that developed consistently and without break, increasing in severity from the beginning to the end. In fact, 57.1% reported that their “suicidal process” fluctuated irregularly prior to their attempt, and only 0.8% reported experiencing no previous suicidal ideation or plan prior to their attempt. Furthermore, in a sample of 105 consecutive patients admitted to an Austrian hospital after a suicide attempt, Deisenhammer and colleagues (2009) reported that the “suicidal process” lasted less than 10 min for nearly 50% of their sample. However, when assessing suicidal process, they asked participants about the “first current emergence of suicidal thoughts,” thereby precluding measurement of thoughts that developed episodically over time rather than building on one another increasingly over time. These methodological concerns raise an issue regarding the precise meaning of an impulsive attempt: Research that measures impulsivity of attempts often overlooks extensive periods of planning and consideration that do not immediately precede the behavior itself by (a) asking participants to specifically consider the period immediately preceding the attempt and (b) framing the time period in a manner that might spuriously influence respondents’ answers (e.g., asking how many minutes were spent planning, thereby priming the individual to think only about a short time frame).

If a person already understands the consequences of engaging in a behavior and the steps required to engage in that behavior, he or she should not need to repeat this process immediately prior to the behavior for it to be considered planned and non-impulsive. For example, emergency surgeons spend countless hours developing expertise at specific components of particular surgical procedures and considering the contextual factors that could affect their decision to utilize one approach versus other options. Yet, when surgeons are involved in an actual emergency surgical procedure, their decisions often appear automatic, as if their decision to choose a particular option reflected a momentary, and perhaps impulsive, decision rather than the result of a deliberate process involving practice, prior experiences, and thoughtful planning. Here again, the clinical implications must be noted, as unplanned behaviors may not be preventable, but behaviors planned long before their enactment may well be.
Measurement Issues in Studies Examining Impulsiveness of Specific Suicide Attempts

The inconsistent operationalizations of impulsive attempts indicate a potential problem in the measurement of the construct. Therefore, we turn our attention to ways in which the impulsiveness of attempts is measured. The Planning subscale of Beck’s Suicide Intent Scale (SIS; Beck, 1990; Beck, Schuyler, & Herman, 1974) is the most commonly used measure for the assessment of impulsiveness of attempts; however, there is little consistency in the number and selection of items to be used. Whereas some work has used only a single item from the measure, other permutations utilized include 2-, 3-, 7-, and 8-item versions (e.g., Brown et al., 1991; O’Donnell et al., 1996; Verkes et al., 1998; Weyrauch, Roy-Byrne, Katon, & Wilson, 2001; Wong & Phillips, 2009; see Table 2 for a summary). Furthermore, not all studies using 8-item versions of the SIS utilize the same items (e.g., Baca-Garcia et al., 2005; Mann & Malone, 1997). To our knowledge, no studies have been conducted comparing scores on this measure of planning to other such measures, thereby leaving the validity of the subscale without empirical support. Indeed, the lack of other established measures of this construct represents a significant obstacle to suicide research.

The shortcomings of the SIS in the assessment of impulsivity of attempts are not limited to inconsistency in item selection. The content of some of the items calls into question the validity of the measure in the assessment of the impulsivity of attempts. For instance, an item assessing the degree to which individuals who attempt suicide do so in isolation from others is often included in the SIS Planning subscale, with less isolation conceptualized as indicating greater impulsivity. This item seems problematic because many highly lethal methods (e.g., jumping from high places) often involve attempting suicide near other people and, if an individual decides that a particular public space (e.g., the Golden Gate Bridge) offers the greatest chance at death and suicide, the person’s efforts to preserve his or her life would constitute the only impulsive action because this behavior had not been planned—an ironic possibility indicating that “whims to live” may exist whereas “whims to die” do not. The possibility that individuals who make well-planned high-lethality attempts lament their decision and “flinch” is supported by the stories of survivors who jump from the Golden Gate Bridge, who have reported that immediately after jumping, they felt a deep sense of regret regarding their actions but were obviously incapable of reversing their decision or contacting help (Bourke, Shapiro, Steel, & Wolfson, 2006).

Other items included in various forms of the Planning subscale assess whether individuals left a suicide note, took specific actions in anticipation of their death, or communicated to others about their desire to attempt suicide. Each of these items has significant problems with respect to the measurement of impulsivity as well. With respect to suicide notes, research has indicated that only 20% to 35% of suicide decedents leave notes (e.g., Shioiri et al., 2005). Assuming that a lack of a note indicates impulsivity is problematic because it increases the odds of an attempt being considered impulsive by requiring that a relatively rare behavior (note-leaving) occur for an attempt to be considered non-impulsive. With respect to taking preparatory actions, the item itself focuses purely on interpersonal actions (e.g., making changes to will, taking out insurance) that may not be relevant to some individuals (e.g., individuals without a will or the assets or the legal representation needed to develop one). Furthermore, the item overlooks the fact that individuals attempting suicide typically feel isolated from others and thus may be disinclined to take actions directly related to other people’s well-being (although the construct of perceived burdensomeness entails a belief that the individual’s death will be worth more than his or her life, implying an effort to help others through lethal self-harm; Joiner, 2005).

With respect to overt communication, it is simply unclear conceptually how an individual’s decision to discuss a thought with another person reflects the degree to which that thought has been developed over time and considered within the context of its short- and long-term affects on the world. Of course, overt communication days prior to an attempt would clearly indicate significant forethought and thus would contradict the notion of an impulsive attempt. Tellingly, Robins (1981) found that 70% of suicide decedents engaged in such communications in the days before their death, usually more than once.

Perhaps the most important limitation to the items in the various forms of the Planning subscale of the SIS is the item that most directly overlaps with other measures used to assess impulsiveness of attempts. Specifically, one item asks how much time was spent considering attempting suicide prior to the attempt, with the available answers being “impulsive; no premeditation,” “considered for <1 hr,” “considered for <1 day,” and “considered for >1 day.” Two primary issues render this item less valuable than it may first appear. First,
the response scale appears to exclude the possibility that an individual extensively considered and planned an attempt long before engaging in the behavior but did not think about it extensively immediately preceding the attempt. For instance, if an individual plans a suicide attempt with great detail during an episode of elevated suicide risk, recovers from that episode with or without attempting, and then attempts suicide in the early portion of a later episode in a manner entirely consistent with the earlier plan, would this be impulsive or simply reflect the enaction of a well thought-out plan? Second, by framing the answers such that three of the four response options involve less than 24 hr, the measure may push respondents to think about premeditation as something that happens only during the moments immediately preceding the behavior. This framework does not offer the possibility that premeditation follows an episodic course, increasing and decreasing (or even ceasing entirely) across different periods of time but still building on itself with each progressive episode of contemplation. Importantly, some studies (e.g., O’Donnell et al., 1996) have provided an even shorter time frame with this item, with answers restricted to 0 (“none”), 1 (“less than 3 hr”), and 2 (“more than 3 hr”), further priming individuals to conceptualize planning as something that occurs only in the moments directly leading up to an attempt (another ironic possibility, as non-impulsive attempts would thus still be considered events that were borne of minimal forethought).

**Proposed Alternative Model of the Relationship Between Impulsivity and Suicidal Behavior**

** Trait Impulsivity**

In contrast to models that conceptualize suicidal behavior as frequently impulsive and that view the relationship between trait impulsivity and suicidal behavior as direct (Figure 1a), we propose that trait impulsivity is best regarded as one of many distal risk factors for suicidal behavior (see Figure 1b). This proposition is presented through the lens of the interpersonal-psychological theory of suicidal behavior (IPTS; Joiner, 2005). The IPTS proposes that, in addition to desiring death by suicide and/or non-lethal suicidal behavior, an individual must acquire the capability for suicide—defined as habituation both to physiological pain and to the fear of death—through repeated exposure to painful and provocative events before he or she can engage in lethal or near-lethal suicidal behavior. In this sense, the capacity to engage in suicidal behavior does not typically develop rapidly but rather reflects a series of encounters with experiences that alter an individual’s response to pain and impending death, with repeated exposures resulting in a dampening of the initial fear response (see A. R. Smith et al., 2012 for evidence that heritability of the acquired capability is approximately 65%).

Initial support for the construct validity of the acquired capability for suicide was reported in studies that did not directly consider the IPTS model. In a series of studies comparing the pain tolerance of individuals who were hospitalized in response to a suicide attempt and individuals admitted to the same emergency room due to accidental injury, Orbach and colleagues (1996) and Orbach, Mikulincer, King, Cohen, and Stein (1997) reported that attempters exhibited higher pain tolerance than did individuals admitted due to accidental injury and that individuals with multiple suicide attempts exhibited greater pain tolerance than did individuals with zero or one prior attempt. Such findings are consistent with the notion that intentionally inflicting harm on oneself has a greater impact on pain tolerance than does accidental injury (thereby providing initial support for the notion that individuals can gradually overcome the fear of discomfort and death through deliberate practice) and that a longer history of self-inflicted injury is more robustly related to increased pain tolerance (providing initial support for the notion that this process unfolds through habituation). Similarly, Nock and Prinstein (2005) reported that increased frequency of NSSI is associated with pain analgesia during NSSI episodes (evidence for habituation), and Nock et al. (2006) reported that pain analgesia during NSSI episodes is associated with a greater likelihood of having made a suicide attempt (evidence for the importance of pain tolerance in the capacity for suicidal behavior). None of these studies utilized longitudinal data demonstrating increases in pain tolerance following repeated engagement in painful and/or provocative experiences, leaving open the possibility that elevated levels of pain tolerance facilitate severe self-harming behaviors entirely different from any habituation process. As such, the research base on this point is not definitive.

Efforts to measure the acquired capability directly have centered on the Acquired Capability for Suicide Scale (ACSS; Bender, Gordon, Bresin, & Joiner, 2011). Using this measure, researchers have reported that men report higher mean levels of the acquired capability than do females and military personnel report higher mean levels of the acquired capability than do civilians (including civilians with multiple lifetime suicide attempts; Bryan, Morrow, Anestis, & Joiner, 2010; Van Orden, Witte, Gordon, Bender, & Joiner, 2008). Further supporting the construct validity of the acquired capability, men engage in significantly fewer non-lethal suicide attempts for every lethal attempt than do women, and military personnel engage in significantly fewer non-lethal suicide attempts for every lethal attempt than do civilians, even when considering attempts that do not involve self-inflicted gunshot wounds (Anestis & Bryan, 2013). Such findings indicate that certain individuals, potentially due to their life experiences (e.g., basic training, physical aggression, NSSI) in combination with a genetic predisposition toward greater pain tolerance and diminished fear, are more able to engage in lethal suicidal behavior than are others, who might need to repeatedly engage in low lethality means.
before developing the capacity to implement a method more likely to result in death or to utilize a lower lethality means in a manner more likely to result in death.

Painful and provocative events represent a fairly broad range of encounters; however, not all impactful life experiences can be considered painful or provocative. Painful and provocative events are understood to involve the experience of physiological pain, bodily harm (or the threat of bodily harm), the threat of death, witnessing the injury or death of others (e.g., witnessing others injured in combat, working in an emergency room setting), or some combination of these factors (e.g., Joiner, 2005). Furthermore, some evidence suggests that mental rehearsal of painful and provocative events (e.g., Post-traumatic Stress Disorder [PTSD] re-experiencing symptoms, daydreaming about death) are associated with elevations in the acquired capability, providing preliminary support for the possibility that cognitions could affect an individual’s capacity for lethal self-harm (e.g., Anestis, Tull, Bagge, & Gratz, 2012; Bryan & Anestis, 2011; Selby, Anestis, & Joiner, 2007). In this sense, the raw number of painful and provocative experiences might not explain the entirety of the acquired capability; however, studies examining the acquired capability have demonstrated that it is associated with a greater lifetime exposure to painful and provocative events, including previous suicide attempts and NSSI (e.g., P. N. Smith, Cukrowicz, Pointdexter, Hobson, & Cohen, 2010; Van Orden et al., 2008). Furthermore, studies show that the relationship between suicidal desire and suicidal behavior is strongest among individuals with elevated acquired capability (e.g., Anestis & Joiner, 2011; Joiner et al., 2009), and multiple studies have demonstrated a robust and statistically significant association between lifetime number of suicide attempts and lifetime number of painful and provocative experiences (e.g., Van Orden et al., 2008). Here again, directionality is not definitive, as no study to date has demonstrated that the acquired capability increases over time in response to painful and provocative experiences; however, extant evidence is thus far consistent with the expectations of the theory.

The IPTS proposes that impulsive individuals become vulnerable to suicidal behavior over time due to the nature of the experiences they tend to encounter relative to the life experiences of non-impulsive individuals (Joiner, 2005). Furthermore, given empirical evidence that the relationship between trait impulsivity and suicidal behavior or death by suicide decreases with age (e.g., Dumais et al., 2005), empirical findings may be more supportive of this model than alternatives in that, over time, non-impulsive individuals could eventually accumulate enough painful and/or provocative experiences to acquire the capacity for suicide whereas, in younger individuals, a tendency toward impulsive behavior may be more important to encounter sufficient pain and/or provocation. In this context, at the ages at which impulsivity is highest (i.e., youth), rates of severe suicidal behavior (e.g., death) are low—a fact that is not consistent with a proximal, direct role of impulsivity in serious suicidal behavior. Our alternative perspective points, rather, toward the cumulative effect of an impulsive lifestyle on suicide risk, noting that only youths who have experienced sufficiently painful and/or provocative events will have acquired sufficient capability for suicide to make a suicide attempt. In adults, on the other hand, the opportunities for non-impulsive individuals to engage in sufficient painful and/or provocative experiences will have increased over time, thereby leading to a decreased association between impulsivity and suicidal behavior.

**Empirical Support for the Proposed Model**

For a study to test the veracity of direct versus distal risk factor models adequately, a number of steps must be taken. With respect to trait impulsivity, mediation analyses must be utilized that consider not only the relationship between impulsivity and suicidal behavior but also the potential explanatory role of environmental experiences (e.g., painful and/or provocative experiences) in that relationship. Such data should be longitudinal to determine whether trait impulsivity prompts increases in painful and/or provocative experiences, which in turn predict future suicidal behavior. If impulsivity truly is a proximal risk factor for suicidal behavior, the cumulative experiences of an impulsive individual’s life should not reduce the relationship between impulsivity and suicidal behavior to a negligible effect.

Research that tested the potential distal risk factor model of trait impulsivity as it relates to suicidal behavior has generally focused on the UPPS-P Impulsive Behavior Scale (UPPS-P; Cyders et al., 2007; Whiteside & Lynam, 2001). For instance, in a sample comprised of 2,011 U.S. military personnel, 1,296 undergraduates, and 399 high school students, Klonsky and May (2010) reported that negative urgency (the tendency to act rashly in an effort to reduce the intensity of negative affect; $d = .41$) and lack of premeditation (the tendency to act quickly without planning; $d = .29$) differentiated attempters from non-suicidal controls ($d_s = .09$-.19 for lack of perseverance and sensation seeking). Between-group differences were of a smaller magnitude when comparing individuals with suicide attempts from individuals with ideation but no attempts ($d_s = -.05$-.26). Furthermore, in a sample of nearly 500 patients in an outpatient community mental health clinic, Anestis and Joiner (2011) reported a four-way interaction of negative urgency and the three components of the IPTS (perceived burdenlessness, thwarted belongingness, acquired capability) in the prediction of lifetime number of suicide attempts, with the strength of the relationship between the IPTS constructs (elevated IPTS variables) and suicidal behavior increasing with negative urgency. Neither of these studies, however, utilized mediation analyses to test models that propose that suicidal behavior is frequently impulsive.

The relevance of this point is highlighted by further analyses of the data from Anestis and Joiner (2011), which revealed...
that the positive associations between negative urgency and both the acquired capability and lifetime number of suicide attempts were mediated by participants’ lifetime number of painful and/or provocative experiences (Anestis, Fink, et al., 2012). Prior work has demonstrated a positive association between negative urgency and desire for death but a negative association between negative urgency and the acquired capability (as measured through the ACSS and behaviorally indexed pain tolerance) in non-clinical samples (Anestis, Bagge, Tull, & Joiner, 2011). In other words, individuals with elevated levels of negative urgency appear, on average, to exhibit higher desire for death but may be less capable of acting on such desire due to an inability to tolerate the physiological and emotional discomfort associated with suicidal behavior. These follow-up analyses thus appear to offer an element of clarity: In clinical samples, people with higher negative urgency may be at risk for suicidal behavior not because of their impulsivity but rather because of the types of behaviors that impulsive individuals in clinical samples tend to engage in over time. In other words, in non-clinical samples, individuals with elevated negative urgency might engage in dysregulated and unhealthy behaviors that are neither painful nor provocative in a manner likely to directly affect their acquired capability (e.g., binge eating, impulsive shopping). In clinical samples, however, individuals with higher negative urgency might be at greater risk for engaging in painful and/or provocative behaviors (e.g., NSSI, physical aggression) that tend to result in elevations in the acquired capability. The difference between non-clinical and clinical samples would thus be the behaviors engaged in by impulsive individuals, not impulsivity itself, with the behaviors utilized by individuals in clinical samples more likely to result in enhanced pain tolerance and a reduced fear of death and bodily harm. Such findings directly support our proposed alternative model and are buffered by the findings of Bender et al. (2011), who also found that painful and provocative events mediated the relationship between impulsivity (BIS and UPPS) and acquired capability. In each case, bootstrapping analyses supported full mediation.

An important consideration, however, is that in each case, the mediation analyses were cross-sectional. As such, assumptions about temporal relationships and causal influences extend beyond the scope of the data. In this sense, although such findings represent substantial obstacles for models arguing a direct role for trait impulsivity in suicidal behavior, they provide only preliminary support for this alternative view of the nature of suicidal behavior. An alternative interpretation might be that some individuals are innately more capable of suicidal behavior and that both suicide attempts and other dysregulated behaviors stem from the same fearlessness and pain tolerance. Although this interpretation does not emphasize the need for the capability to be developed over time, it remains in line with the notion that suicidal behavior is fear-provoking and involves either pain or the threat of severe bodily harm. As such, the possibility that suicidal behavior is distinct from behaviors engaged in after a suddenly emerging thought or emotion (e.g., NSSI) remains plausible and the centrality of impulsivity in suicidal behavior remains in question.

Proposed Model of Impulsiveness of Specific Suicide Attempts

We believe that people are motivated to preserve life and that the will to live does not exist alongside an impulse for death. Furthermore, we believe that individuals who develop suicidal desire contemplate, plan, and then eventually engage in suicidal behavior as a culmination of a process that requires planning and resolve and does not reflect a sudden, unforeseeable, emotion-laden impulse. Although the degree of planning varies across cases, we believe the floor of this range is higher than that considered in models that conceptualize suicidal behavior as impulsive and that the occurrence of attempts in the absence of substantial planning remains far below that predicted by such models. Furthermore, although the amount of time that elapses between a decision to enact self-harm and the actual behavior may be brief, the behavior is not necessarily impulsive as significant thought about suicide likely occurred in the hours, days, and weeks prior to the final decision. The fear and discomfort associated with suicide attempts require individuals to experience at least a momentary increase in negative affect and physiological discomfort to obtain a goal (death). Given that, for many individuals who are motivated to attempt suicide, a primary motivation for impulsive behaviors is an immediate escape from negative affect (e.g., Nock & Prinstein, 2005), suicidal behavior appears to require not only a delay in obtaining that outcome but in fact a momentary increase in the experience (negative affect) that the individual seeks to avoid.

We suggest that impulsive individuals engage in suicidal behavior at an elevated rate but that they do not do so impulsively. The nature of suicide is inconsistent with the motives that drive many of their impulsive actions, and the fear associated with facing imminent death serves as too great of an obstacle for an individual to overcome without significant thought and planning. One measure was recently developed in an effort to assess episodic planning of suicidal behavior (Measure of Episodic Planning of Suicide [MEPOS]; Anestis, Pennings, & Williams, 2014). The scale asks how long an individual planned his or her most recent attempt (with thoughts of using the specific method ultimately chosen for that attempt), even if periods of time passed between thoughts. The authors reported that, in a sample of 50 individuals with at least one prior attempt, no individuals whose most recent attempt involved clear intent to die reported engaging in suicidal behavior without any planning. Furthermore, among the full sample, the average time spent planning was between several days and several weeks and, for individuals whose most recent attempt involved clear intent to die, the average time spent planning was between several weeks and several
months. Despite these promising early results, more work is needed to test this conceptualization of suicidal behavior. That being said, we believe that acknowledging this perspective as a viable alternative to current conceptualizations that emphasize impulsivity will lead to future studies better able to address current ambiguities.

**Future Directions**

As scientists move toward a better understanding of the relationship between impulsivity and suicide, a number of steps can be taken to enhance the insight provided by the research findings. First, with respect to trait impulsivity, although we have already noted that any examination of traits will be unable to evaluate models proposing that suicidal behavior is frequently impulsive, greater methodological rigor can nonetheless result in more stringent theory-driven tests likely to reduce the amount of inconsistency across studies. Specifically, researchers should include covariates that assess the degree to which the experiences typically encountered by impulsive individuals might account for any significant relationship. Such methodological rigor would allow for a clearer test of the degree to which impulsivity exhibits a direct relationship with suicidal behavior. In addition, the field would benefit from a clearer delineation of the role of planning in impulsive behavior. Indeed, we anticipate that some readers may disagree with our contention that planning is incompatible with impulsivity (or at least certain subcomponents of impulsivity). Greater conceptual clarity would thus afford a greater opportunity for consensus building with respect to the role of impulsivity in suicidal behavior.

Changes in how trait impulsivity is studied will not completely address the issues mentioned in this review. Indeed, we believe an emphasis on trait impulsivity would be unlikely to yield definitive results either way. The study of impulsivity of attempts also needs significant adjustments. Specifically, new measures and/or methodologies that are more sensitive to the possibility that planning occurs in a non-linear, episodic manner need to be developed and validated. Such measures should be capable of assessing whether people have considered suicidal behavior to any degree in the past and, if so, when those thoughts occurred, what those thoughts entailed, and what changed across time prior to engagement in an attempt (e.g., diminishing fear of death, increased tolerance of physiological pain). The development of such measures would uncover the course of risk and the path toward deciding to enact lethal self-harm.

In summary, the evidence for models positing that suicidal behavior is frequently impulsive is problematic. Indeed, the mean effect size for the relationship between trait impulsivity and suicidal behavior is small in magnitude. Furthermore, work purporting to measure impulsivity of attempts has yielded valuable clinical information, but methodological obstacles (e.g., failure to assess for episodic planning) have prevented such studies from accurately assessing the construct. Further work is needed to enhance confidence in our proposed model; however, we believe that an emerging line of research supports the view that people very rarely, or perhaps even never, attempt suicide without substantial forethought and planning.

**Authors’ Note**

The views in this article are those of the authors and do not necessarily represent the official policy or position of the Department of Veterans Affairs, the Department of Defense, or the United States Government.

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**Supplementary Material**

The online supplementary appendix is available at http://psp.sagepub.com/supplemental.

**Notes**

1. We also ran additional meta-analyses in which (1) a grand mean effect was calculated for each effect and (2) multiple effects were all entered separately from the same sample. In each case, results mirrored the findings of our meta-analysis examining only a single representative effect from each sample (Hedges $g = .31-.34$).

2. To ensure that results were not spuriously impacted by differences in the constructs assessed in self-report versus behavioral measures of impulsivity, we ran an additional set of exploratory meta-analyses in which (1) only a single self-report effect was considered within each sample or (2) only a single behavioral effect was measured within each sample. Results from both samples indicated small effect sizes (Hedges $g = .33, k = 71$ for self-report; Hedges $g = .40, k = 6$ for behavioral measures). These results slightly favor behavioral measures; however, the small number of samples with behavioral data renders such results difficult to interpret.

3. To examine whether the strength of the relationship between trait impulsivity and suicidal behavior is dependent on other variables, we ran a series of exploratory analyses examining sex, age, and assessment type as potential moderators. Results from meta-regressions indicated that neither age ($z = −1.01$;
$p = .31$ nor the percentage of the sample that is male ($z = -.01$; $p = .98$) affects the strength of the relationship between trait impulsivity and suicidal behavior. Similarly, analyses considering measurement type (self-report vs. other) revealed no significant moderation effect.

**References**

References marked with an asterisk indicate studies utilized in meta-analysis but not referenced within the text.


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