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Quantifying the Impact of Recent Negative Life Events on Suicide Attempts

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The extent to which a specific negative life event (NLE) is a triggering factor for a suicide attempt is unknown. The current study used a case-crossover design, an innovative within-subjects design, to quantify the unique effects of recent NLEs on suicide attempts. In an adult sample of 110 recent suicide attempters, a timeline follow-back methodology was used to assess NLEs within the 48 hours prior to the suicide attempt. Results indicated that individuals were at increased odds of attempting suicide soon after experiencing a NLE and that this effect was driven by the presence of an interpersonal NLE, particularly those involving a romantic partner. Moreover, the relation between interpersonal NLEs and suicide attempts was moderated by current suicide planning. Interpersonal NLEs served as triggers for suicide attempts only among patients who were not currently planning their attempt. Findings suggest the importance of considering potential interpersonal NLEs when evaluating imminent risk for suicide attempts.

Keywords: negative life events, suicide attempts, suicidality, timeline follow-back method, trigger

In the United States alone, one individual will die by suicide every 15 minutes (CDC, 2010), and it is estimated that for each completed suicide, there are 25 suicide attempts (Goldsmith, Pellmar, Kleinman, & Bunney, 2002). Identification of those at greatest risk for attempting suicide is critical for effective prevention and intervention efforts. To this end, research has focused on identifying risk factors, or risk markers, for suicide attempts (e.g., Joiner, 2005; Mann, Waternaux, Haas, & Malone, 1999; Nock et al., 2008). A risk factor is broadly defined as, "anything that increases the probability of developing a pathology" and "is simply correlated with the development of pathology, and may not be causally implicated in the pathogenesis" (Millon & Davis, 1999, p. 29). Risk factors can be either distal from, or proximal to, a target event—for instance, a suicide attempt. Distal risk factors are temporally distant from a suicide attempt, occurring in the years, months, or weeks prior to an attempt (Bagge & Sher, 2008; Hufford, 2001). Although these distal factors may indicate *who* is more likely to attempt suicide, they do not indicate *when* an individual may be at greatest risk for attempting.

In contrast, proximal risk factors are temporally close to a suicide attempt and exert their influence in the day, hours, or minutes prior to an attempt (Bagge & Sher, 2008; Hufford, 2001). These proximal factors are closely linked to the timing of the attempt and thus may suggest *when* an individual may be at imminent risk for attempting suicide. Moreover, the term "trigger" is defined as a specific type of proximal risk factor that is assessed within (as opposed to between) individuals and determines whether a risk factor is *unusual* for a particular individual (Maclure & Mittleman, 2000). In this case, a trigger is unique to the time period when an individual attempted suicide compared with another similar time period when he or she did not attempt. Identification of triggers may help answer the question: Why did the individual attempt suicide *today* compared with a previous day?, and thereby aid in determining imminent risk for suicide.

Negative Life Events

The presence of recent negative life events (NLEs) is one such risk factor, and potential trigger, that may be useful for determining imminent risk for suicide attempts. However, the vast majority of research to date has focused on NLEs as distal risk factors for suicide attempts. This large literature has spanned more than two decades and has consistently found evidence for a positive association between NLEs and suicidal behavior (i.e., suicide attempts and completions) in various populations: adolescents (Beautrais, Joyce, & Mulder, 1997; Brent et al., 1993; Cooper, Appleby, & Amos, 2002) and adults (Cavanagh, Owens, & Johnstone, 1999; Conner et al., in press; Cooper et al., 2002; Heikkinen, Aro, & Lonnqvist, 1992; Weyrauch, Roy-Byrne, Katon, & Wilson, 2001; Yen et al., 2005), as well as across multiple suicidal behavior

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phenotypes: both attempted suicide (Beautrais et al., 1997; Conner et al., in press; Weyrauch et al., 2001; Yen et al., 2005) and completed suicide (Brent et al., 1993; Cavanagh et al., 1999; Cooper et al., 2002; Heikkinen et al., 1992). Although some studies examined NLEs in the weeks leading up to the attempt (e.g., Cooper et al., 2002), the majority of studies have included a very long exposure window for the NLE assessment in relation to the suicide attempt (e.g., the year prior; Beautrais et al., 1997). However, arguably, if our goal is to determine whether a NLE is a trigger for a suicide attempt, research should focus on NLEs occurring within a time period prior to, but also closely surrounding, the attempt (e.g., within hours of the suicidal act).

Purely descriptive research suggests that NLEs are perceived as precipitating events, or triggers, for suicide by next of kin (Heikkinen et al., 1992). However, to our knowledge, only one previous controlled study has focused on NLEs that occurred specifically on the day of the suicide attempt (Conner et al., in press). This study found that a NLE was more likely to occur on the day of a suicide attempt among patients with alcohol use disorders (AUD) compared with a corresponding day for nonsuicidal AUD controls. Triggering effects of NLEs were also observed: Attempters were more likely to experience a NLE on the day of the suicidal act compared with a previous nonsuicidal day. Given that suicide is related to a number of Axis I disorders beyond AUD (Nock et al., 2008), further examination of NLEs as specific triggers for suicidal behavior in clinically diverse samples is needed. Therefore, the first goal of the current study was to determine the triggering effects of any acute NLE on suicide attempts in a clinically heterogeneous sample of psychiatric patients. This first aim addressed two limitations of previous research by: (a) using a methodology that facilitates assessing proximal, as opposed to distal, NLEs; and (b) enhancing generalizability of results using a more diverse psychiatric sample.

NLE Type

There is both empirical and theoretical evidence to suggest that various NLE categories may have differential importance for suicidal behavior. For instance, previous research suggests that suicidal behavior is often preceded by certain NLEs, such as physical health problems (Cavanagh et al., 1999; Heikkinen et al., 1992), legal problems (Brent et al., 1993), financial and job difficulties (Heikkinen et al., 1997), loss events (Brent et al., 1993; Cheng, Chen, Chen, & Jenkins, 2000; Heikkinen et al., 1997), and interpersonal difficulties (Beautrais et al., 1997; Cavanagh et al., 1999; Heikkinen et al., 1997; Weyrauch et al., 2001).

Studies examining specific types of NLEs occurring within months of an attempt find that interpersonal NLEs, in particular, pose specific risk for suicide attempts. For instance, in an AUD sample, Conner et al. (in press) found that major (severe) interpersonal events (e.g., divorce), but not major noninterpersonal events (e.g., physical injury), occurred more often within a 3-month period among suicide attempters than among nonsuicidal controls. In addition, Yen et al. (2005) examined a wide range of NLEs in the month preceding a suicide attempt and found that two specific categories—love/marriage and crime/legal—were related to attempts. And finally, Cooper, Appleby, and Amos (2002) found that forensic and interpersonal events were more common for suicide completers in the week prior to the suicidal act, as compared with a similar week for controls.

Taken together, despite evidence suggesting that specific domains of NLEs (e.g., interpersonal) may confer differential risk for suicidal behavior, we do not know whether these events are also *triggers* for suicide attempts. Therefore, a second goal of the current study was to examine specific NLE domains—interpersonal (spouse/partner, family/social) and noninterpersonal (crime/legal, financial, work/school, health)—as triggers for suicide attempts.

Moderation by Suicide Planning

Importantly, these NLEs may not impose uniform risk for all people and, therefore, it is crucial to examine potential moderators of this relation. Current suicide attempt planning (the degree of forethought about the attempt prior to carrying it out; Conner, 2004) is one factor that may influence the extent to which NLEs impact risk for suicide attempts. Examining moderation by attempt planning is particularly important because degree of attempt planning has seen related to attempt severity. For instance, more attempt planning has been associated with greater attempt lethality (Baca-Garcia et al., 2001; Mann et al., 1996). Further, by definition, less suicide planning indicates less forethought (e.g., less than 5 minutes of contemplation; Simon et al., 2001), leaving little time for typical interventions. Thus, the degree of planning surrounding an attempt has different implications for suicide prevention (see review, Conner, 2004).

Indeed, previous research suggests that having a significant NLE, or a certain type of NLE, may be a more relevant trigger for suicidal behavior among individuals who were not currently planning their suicidal act. For instance, research indicates that experiencing a recent NLE (i.e., 2 days prior to suicide) was associated with less planning of that fatal act (Conner, Phillips, & Meldrum, 2007). Moreover, Weyrauch, Roy-Byrne, Katon, and Wilson (2001) demonstrated that certain past-year interpersonal NLEs, but not noninterpersonal NLEs, were related to less planning of a recent attempt. However, although previous results are suggestive of a NLE-planning interaction, little explanation has been provided for why NLEs may be particularly relevant for nonplanners. It is possible that NLEs may not initiate action for individuals who are currently planning a suicide attempt because these individuals may have already made their preparations and are waiting for a predetermined "right" time. In contrast, for individuals who are *not* currently planning a suicide attempt, NLEs may serve as a catalyst to engage in suicidal behavior; these individuals may have had thoughts of suicide but have not yet planned when, so "*Why not now*?" Moreover, studies have not yet examined whether interpersonal NLEs are more likely to specifically *trigger* (as opposed to surround) a suicide attempt among individuals not currently planning their attempt. To address this gap in the literature, the current study examined whether planning moderated the triggering effect of recent NLEs on suicide attempts.

The Case-Crossover Design

To determine which factors were unusual for an individual on the day of their attempt, and to most adequately answer the ultimate question of "*Why today?*" a within-subjects design is

necessary. The case-crossover design is a within-subjects technique that uses each individual case as his or her own control (Maclure & Mittleman, 2000). Initially developed to detect triggers for myocardial infarction, this design measures factors that change from day-to-day (e.g., life events) during a time period surrounding a target event (e.g., suicide attempt). For each individual, factors on the day of the target event are then compared with the same factors on a day more distant from the target event. This design is advantageous because it provides the most conservative control—the same individual on a day when the target event did not occur (e.g., when he or she did *not* attempt suicide). Thus, the case-crossover design controls for all stable risk factors (e.g., gender, history of a mood disorder, childhood abuse), which do not change daily and instead allows for a controlled examination of time-varying and unique *triggers* of the specific target event (e.g., suicide attempt).

As discussed above, there has only been one case-crossover study to date examining the impact of NLEs on suicide attempts. Conner et al. (in press) provides preliminary evidence for NLEs as triggers for suicide attempts, in an AUD patient sample.[1] The current study built upon this study by examining a range of NLE categories as triggers for suicide attempts using a case-crossover design, in a clinically heterogeneous sample of psychiatric patients. In addition, the current study also extended previous research by determining whether a NLE (i.e., any NLE and any interpersonal NLE) differentially triggered a suicide attempt among those who are, and who are not, currently planning their attempt. The present study tested the following hypotheses: (a) individuals are more likely to attempt suicide following a proximal NLE; (b) interpersonal NLEs, and spouse/partner NLEs in particular, will serve as specific triggers for suicide attempts; and (c) interpersonal NLEs are more likely to trigger a suicide attempt among individuals who are not currently planning their attempts.

Method

Participants

Participants, between the ages of 18 and 64, who presented to a hospital within 24 hours after a suicide attempt (i.e., a self-inflicted behavior with some intent to die; Silverman, Berman, Sanddal, O'Carroll, & Joiner, 2007) were recruited from the only Level 1 trauma hospital in Mississippi. We recruited recent suicide attempters from all areas of the hospital (e.g., inpatient, ER, medical floors) to increase the psychiatric heterogeneity of the sample. To be included in the study, patients also had to report that (a) the suicide attempt was their reason for hospital admission, and (b) they had at least some intent to die at the time of the act. Exclusion criteria included the presence of factors that would interfere with the capacity to provide informed consent or complete the study (e.g., intoxication or disorganized speech/thought content). One-hundred ten suicide attempters (59% female) were enrolled in the present study (85.2% of those approached about the study) between October 2008 and October 2010. Mean age of the sample was 36.39 years (SD = 11.31) and the ethnic composition of the sample was 68% White, 28% Black, and 4% Other Race/Ethnicity.

Procedure

Written consent (approved by an institutional review board) was obtained prior to study initiation. Patients were approached after initial medical/psychological evaluations and assessment sessions occurred close to discharge, and also within 7 days of their suicide attempt. The assessment session required approximately 2.5 hours to complete and included a battery of self-report questionnaires and semistructured interviews. The sequence of assessment measures was counterbalanced to control for possible order effects. Participants volunteered for the current study without compensation.

Interviewers underwent 2 months of training before collecting data for the study. This article focuses on data collected from two interviews: a modified Timeline Follow-Back Interview (TLFB; Sobell & Sobell, 1992) and the Suicide Intent Scale (SIS; Beck, Schuyler, & Herman, 1974). For the TLFB, interviewers included the Principal Investigator (PI; author CLB) and advanced undergraduate students in psychology trained to reliability by the PI; all interviews were reviewed by the PI, with ratings confirmed in consensus meetings. The PI conducted all SIS interviews.

Measures

Suicide descriptives. Prior history of attempts and method of the current attempt were obtained by interviewers asking participants, "How many suicide attempts have you made in your lifetime?" (Nock, Holmberg, Photos, & Michel, 2007) and for your most recent attempt, "What method(s) did you use?" (Kessler & Ustun, 2004). Participants reporting more than one suicide attempt were considered multiple attempters, whereas participants reporting only one lifetime attempt were considered first-time attempters.

TLFB assessment of NLEs. Similar to the methods employed by Conner et al. (in press), a TLFB methodology (Sobell & Sobell, 1992) was used to gather retrospective information on the timing of NLEs during a specified time period prior to a suicide attempt. Given our focus on acute life events, the TLFB used an hourly calendar (e.g., Vinson, Maclure, Reidinger, & Smith, 2003), as opposed to a daily calendar, to assess the presence and timing of NLEs during each hour of the 48 hours prior to the attempt. First, interviewers assessed the date and time of the recent suicide attempt. Based on this information, participants were given the day/dates/times of both the start and ending point of the 48-hr period of interest. Basic contextual information was gathered (e.g., where they were, who they were with, what they were doing) to serve as anchors for recall. Next, participants were presented with a list of 33 acute NLEs and asked whether any of these events occurred during the 48 hours prior to the attempt. Interviewers confirmed with participants that each endorsed event was viewed as being negative in nature. After basic information was gathered to serve as anchors for recall, the exact timing (i.e., start and stop time) of each endorsed NLE event was determined.

Content of NLE. Consistent with the work by Yen et al. (2005), the list of NLEs was adapted from the Psychiatric Epide-

[1] Conner et al. (in press) examined whether the presence of any NLE was a trigger for a suicide attempt, but did not examine specific NLE domains as potential triggers using the case-crossover design.

miology Research Interview Life Events Scale (Dohrenwend, Krasnoff, Askenasy, & Dohrenwend, 1978). The NLE assessment included 33 acute events or circumstances, grouped into six stress domain categories (Yen et al., 2005) and two broad categories based on the interpersonal nature of the event (Conner et al., in press); chronic stressors were not included in the NLE assessment. For the last item, participants reported any "other important NLE." If the response content was similar to existing items, the "other NLE" was recategorized to its appropriate category. Discarded "other" NLEs included chronic stressors that spanned the whole 48-hr period.

The assessment focused on whether the specific NLEs occurred during the "case period" (the day of, or 24 hours prior to, the attempt) or the "control period" (the day before, or hours 24 to 48 prior to, the attempt). Categories were rated as present if any item within the category was endorsed. Across the entire 48-hr period prior to the attempt, NLEs were placed in the following categories: (a) interpersonal, including: spouse/partner relationships (four items; e.g., broke up with romantic partner) and family/social community relationships (six items; e.g., argued with relative); and (b) noninterpersonal, including: work/school (six items; e.g., fired), crime/legal (six items; e.g., law violation), financial (six items; e.g., evicted), and health (four items; e.g., seriously injured). Interrelations between stress domain categories were low (rs = −.03–.23), suggesting that these are relatively independent NLE categories.

Planning of suicide attempt. The SIS (Beck et al., 1974), a reliable and valid interview schedule (Beck et al., 1974; Kaslow, Jacobs, Young, & Cook, 2006) that evaluates the severity of an individual's wish to die following a suicide attempt, was utilized to assess planning of the participant's current attempt. Consistent with previous studies, two items (suicide preparation and suicide premeditation) were used to assess planning of the suicide attempt (e.g., Baca-Garcia et al., 2001; Suominen, Isometsa, Henriksson, Ostamo, & Lonnqvist, 1997). For the current study, because moderation within conditional logistic regression is only possible using dichotomous variables, a dichotomous suicide planning item (1 = at least some preparation or contemplation for 3 hours or more; 0 = no preparation and contemplation for less than 3 hours) was created from the original SIS response options. SIS data was collected after the first 17 participants and, therefore, is only available for 93 attempters.

Psychiatric symptoms. To examine the extent to which psychiatric symptoms moderated the NLE-attempt association, the study also included the following measures: the Personality Assessment Inventory-Borderline Features Scale (PAI-BOR; Morey, 1991), the Alcohol Use Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993), the Drug Abuse Screening Test-10 (DAST-10; Bohn, Babor, & Kranzler, 1991), and the Center for Epidemiological Studies Depression Screening Index-10 (CESD-10; Andresen, Malmgren, Carter, & Patrick, 1994). In line with previous research, the following threshold scores were used to measure clinically significant symptoms in the moderation analyses: 38 or above (66.6%) for borderline personality disorder features (Bagge et al., 2004; Morey, 1991), 8 or above (38.5%) for problematic alcohol use (Saunders et al., 1993), 4 or above (33.0%) for drug use (Bohn et al., 1991; Cocco & Carey, 1998), and 10 or above (90.7%) for depression (Andresen et al., 1994). Consistent with prior work (e.g., Nock et al., 2008), the majority of suicide attempters had significant depressive symptoms; therefore, given the instability of estimates with low cell counts, moderation by depression was not examined.

Data Analytic Plan

Univariate and multivariate analyses. A series of conditional logistic regression analyses (see Stokes, Davis, & Koch, 2000) were used to test our hypotheses. Conditional logistic regression analysis is similar to traditional logistic regression, except that the case period (24 hours prior to the attempt) and control period (hours 25 to 48) are pair-matched within individuals. The dependent variable was the presence (coded 1) or absence (coded 0) of a suicide attempt in the case versus control period. Presence of NLEs within the case period (compared with the control period) was the independent variable used to predict risk of attempt. NLEs were parameterized (1 = present and 0 = absent) in three ways: (a) any NLE, (b) any interpersonal NLE, and (c) specific types of NLEs (i.e., the six stress domain categories) in the 24-hour time periods. Two series of conditional logistic regression analyses (univariate and multivariate) were conducted for each parameterization of NLEs.

Moderation analyses. Moderation within a case-crossover design concerns an interaction effect or "difference of differences" (e.g., the difference between NLEs in case and control periods is hypothesized to be greater among one subgroup [nonplanners] than among another subgroup [planners]). Factors such as characteristics of the index (current) attempt do not vary *within* individuals and cannot serve as a traditional independent variable to predict risk of attempt (as in case-control studies). These variables can, however, serve as grouping variables (or effect modifiers) to determine whether a NLE (i.e., any NLE and any interpersonal NLE) differentially triggers a suicide attempt among those who are, and who are not, currently planning their attempt. Therefore, the conditional logistic regression analyses described above were modified with a strategy commonly used in the multilevel analysis of couple data to incorporate categorical between-subjects variables into the analysis. Finally, we used the TEST command in SAS Proc Logistic to determine whether the two estimates differed significantly across subgroups.

Results

General Descriptive Information

Approximately half of suicide attempters reported prior planning for the current attempt (53.76%). Sixty percent reported having a history of suicide attempts (number of prior attempts among repeat attempters: M = 5.18, SD = 6.81). The most common index suicide attempt methods were overdose of medications (75.45%), overdose of alcohol or other drugs (12.73%), sharp instrument (13.64%), and gun (5.45%). Other methods (7.27%) included hanging, jumping from high places, motor vehicle crash, or immolation.

Exposed Cases

A participant is considered exposed if he or she reported a NLE during the period of interest. Results indicate that 69

Table 1
Univariate and Multivariate Conditional Logistic Regression Analyses Predicting Suicide Attempts From Negative Life Events

	Exposed *n* (%)		Univariate OR (CI)	Multivariate Adjusted OR (CI)
	Day before	Day of attempt		
Overall NLE				
Any NLE	46 (41.8)	69 (62.7)	2.35 (1.33 to 4.15)**	
Interpersonal nature of NLE				
Any interpersonal NLE	31 (28.2)	55 (50.0)	2.85 (1.51 to 5.35)**	2.82 (1.50 to 5.30)**
Any noninterpersonal NLE	23 (20.9)	28 (25.5)	1.29 (0.69 to 2.44)	1.20 (0.61 to 2.33)
Specific type of NLE				
Any spouse/partner NLE	15 (13.6)	30 (27.3)	6.00 (1.77 to 20.37)**	5.37 (1.57 to 18.41)**
Any family/social NLE	18 (16.4)	31 (28.2)	2.18 (1.07 to 4.45)*	2.09 (0.99 to 4.42)
Any crime/legal NLE	7 (6.4)	7 (6.4)	1.00 (0.32 to 3.10)	0.75 (0.22 to 2.54)
Any financial NLE	10 (9.1)	13 (11.8)	1.43 (0.54 to 3.75)	1.43 (0.52 to 3.96)
Any work/school NLE	5 (4.6)	7 (6.4)	1.50 (0.42 to 5.32)	1.38 (0.35 to 5.43)
Any health NLE	5 (4.6)	5 (4.6)	1.25 (0.34 to 4.66)	0.99 (0.25 to 4.02)

Note. $N = 110$. NLE = Negative Life Event; *OR* = Odds Ratio; *CI* = 95% Confidence Interval; Exposed = presence of a particular NLE on the day before or the day of the suicide attempt; Univariate = Conditional logistic regression analyses with only one predictor in the model; Multivariate = Conditional logistic regression analyses with more than one predictor in the model; Variables are coded 1 = present; 0 = absent.
* $p < .05$. ** $p < .01$.

patients (62.73% of the sample) experienced a NLE; 50% ($n = 55$) of the sample reported having at least one interpersonal NLE and 25.45% ($n = 28$) reported at least one noninterpersonal NLE during the case period. The most common specific types of NLEs during the case period were family/social (28.18%) and spouse/partner (27.27%), followed by financial (11.82%), crime/legal and work/school (both 6.36%), and health (4.55%).

Univariate Conditional Logistic Regression Analyses

The first series of analyses included univariate associations between all parameterizations of NLEs and suicide attempts (i.e., dependent variable (DV) is the presence or absence of an attempt on the case vs. control days; see Table 1). Results indicated that experiencing a NLE was associated with a 2.35 times greater risk of attempting suicide ($p < .01$). Further, this relation was driven by the presence of an interpersonal NLE (*OR* = 2.85, $p < .01$); a noninterpersonal NLE did not increase risk for a suicide attempt (*OR* = 1.29, *ns*). When further dividing interpersonal and noninterpersonal NLEs into specific NLE categories, only having a spouse/partner NLE (*OR* = 6.00; $p < .01$) and a family/social NLE (*OR* = 2.18, $p < .05$) increased risk for a suicide attempt. All remaining specific (noninterpersonal) NLE categories were not related to a suicide attempt (*OR*s ranged from 1.00 to 1.50, *ns*).

Multivariate Conditional Logistic Regression Analyses

The second series of analyses included unique associations (within each NLE parameterization) between NLEs and suicide attempts (see Table 1). Results were consistent with the first series of analyses, such that an interpersonal NLE (*OR* = 2.82, $p < .01$) was uniquely related to a suicide attempt when controlling for a noninterpersonal NLE (*OR* = 1.20, *ns*). However, only a spouse/partner NLE (*OR* = 5.37 $p < .01$) uniquely predicted suicide attempts when controlling for other specific NLE categories (*OR*s range from 0.75 to 2.09, *ns*).

Moderation Analyses

Table 2 presents the results of the moderation analyses examining the effect of any NLE on a suicide attempt as a function of index attempt planning and psychiatric symptoms. Results indicated significant moderation by current attempt planning: Experiencing an acute NLE was a trigger for a suicide attempt among individuals not currently planning their attempt (*OR* = 6.00, $p < .001$), but not among those currently planning their attempt (*OR* = 1.00, *ns*). The any NLE suicide attempt association did not differ by psychiatric symptoms. Next, the same pattern of results was observed when examining moderation of the any interpersonal NLE suicide attempt relation (see Table 3; nonplanning subgroup: *OR* = 11.00, $p < .01$; planning subgroup: *OR* = 1.38, *ns*). Finally, the lack of relation between any noninterpersonal NLE and a suicide attempt did not differ as a function of current attempt planning or psychiatric symptoms, all *p*s $> .10$[2].

Discussion

The goals of this study were to (a) determine the triggering effects of any acute NLE on suicide attempts, (b) examine a range of NLE categories as triggers for suicide attempts, and (c) examine whether the association between acute NLEs and suicide attempts varied as a function of current attempt planning. This study is the first, to our knowledge, to use the TLFB design to provide initial estimates of the triggering effect of NLEs on suicide attempts among a psychiatrically diverse sample. First, consistent with previous research (Cheng et al., 2000; Weyrauch et al., 2001; Yen et al., 2005), the current study found that NLEs were proximal risk factors for suicide attempts. Moreover, based on the use of a case-crossover design, results also indicated that NLEs were *trig-*

[2] We also tested whether the association between NLEs (i.e., any NLE, any interpersonal NLE, any noninterpersonal NLE) and suicide attempts was moderated by gender and history of attempts (i.e., first vs. repeat attempts). No moderation was observed.

Table 2
Conditional Logistic Regression Analyses Examining the any NLE-Suicide Attempt Relation as a Function of Current Suicide Planning and Psychiatric Symptoms

		Exposed *n* (%)				
	N	Day before	Day of attempt	*OR*	95% *CI*	*p*
IV = Any NLE						
Moderator: Suicide planning	93	40 (43.0)	60 (64.5)			.01
No plan subgroup	43	12 (27.9)	32 (74.4)	6.00***	2.08–17.29	
Plan subgroup	50	28 (56.0)	28 (56.0)	1.00	0.42–2.40	
Moderator: BPD	105	44 (41.9)	67 (63.8)			.68
No BPD subgroup	35	11 (31.4)	21 (60.0)	3.00*	1.09–8.25	
BPD subgroup	70	33 (47.1)	46 (65.7)	2.30*	1.09–4.83	
Moderator: Alcohol problems	109	45 (41.3)	69 (63.3)			.86
No alcohol problems subgroup	67	27 (40.3)	41 (61.2)	2.40*	1.04–6.82	
Alcohol problems subgroup	42	18 (42.8)	28 (66.7)	2.67*	1.14–5.02	
Moderator: Drug problems	106	43 (40.6)	67 (63.2)			.78
No drug problems subgroup	71	23 (32.4)	42 (59.2)	2.73**	1.36–5.44	
Drug problems subgroup	35	20 (57.1)	25 (71.4)	2.25	0.69–5.44	

Note. BPD = Borderline Personality Disorder; *OR* = Odds Ratio; *CI* = Confidence Interval; Exposed = presence of a NLE.
* $p < .05$. ** $p < .01$.

gers for suicide attempts, consistent with Conner et al. (in press): NLEs occurred more often on the day of, as opposed to the day before, a suicide attempt. Notably, a case-crossover design is ideal for separating acute from chronic effects on suicide attempts because it provides estimates of intermittent NLEs over and above baseline risk associated with past history of NLEs.

Rates of NLEs in the current study are consistent with previous research finding that the majority of suicide attempters report a significant NLE in the months and weeks leading up to an attempt. For instance, Yen et al. (2005) found that almost all suicide attempters (99.8%) experienced a NLE in the month prior to their attempt and Heikkinen et al. (1997) found that 70% of suicide completers experienced a NLE in the week prior to their suicide. In addition, although Weyrauch et al. (2001) did not provide overall rates of NLEs, 47% of attempters reported experiencing an interpersonal NLE with a romantic partner, and 71% experienced a financial concern, in the week prior to their attempt.

However, the current study and Conner et al. (in press) found large differences in rates of NLEs on the *day* of the suicide attempt (current study: 63% vs. Conner et al.: 11%). Although similar in content, timing of the NLE assessment could be one reason for higher rates of NLEs in the current sample. Conner et al. included AUD patients who attempted suicide within 90 days of entry to residential treatment, which means that some participants may have been asked to report NLEs from 3 months prior. In contrast, participants in the current sample attempted suicide within 24 hours of hospital admission and NLEs were assessed within 7 days of admittance. In addition, Conner et al. assessed NLEs by *day* in the 90 days prior to the suicide attempt, whereas the current study assessed NLEs by *hour* in the 48 hours prior to the attempt. Using hour versus day units in the assessment may have enhanced recall of NLEs on the day of the attempt. Alternatively, the current study may have used a lower threshold for determining the presence of a NLE, thereby increasing the prevalence of NLEs. However, if these less severe, but still significant, NLEs are helpful in predicting when an individual will attempt suicide, future studies may consider varying NLE thresholds. Taken together, methodology differences and difficulties with retrospective recall may have contributed to the discrepant rates between studies.

Second, and also in line with previous research (Conner et al., in press; Cooper et al., 2002; Yen et al., 2005), the present study's results suggest that interpersonal NLEs might be particularly important risk factors for suicide attempts. This study is the first, to our knowledge, to use a case-crossover design to empirically demonstrate that interpersonal NLEs are specific *triggers* for suicide attempts. Notably, results varied by current planning of the suicide attempt. For attempters with current suicide planning, the presence of a NLE did not further their suicidal plans, or trigger action. However, for attempters not currently planning their attempt, a NLE served as a trigger for engaging in suicidal behavior. The current study's results are consistent with growing evidence suggesting that NLEs, particularly interpersonal NLEs, are associated with less suicide planning (Conner et al., 2007; Weyrauch et al., 2001).

In line with the interpersonal–psychological theory of suicide (IPT; Joiner, 2005), these findings suggest that interpersonal NLEs, in particular, may engender feelings of less belongingness and greater perceived burdensomeness—two constructs thought to increase suicidal desire. For individuals without prior suicide planning, an interpersonal NLE was relatively unusual and could have led to substantial increases in feelings of burdensomeness and less belongingness which triggered their attempts. But why weren't these NLEs also triggers for the planners? Interestingly, planners were just as likely to experience a NLE on the day of, as the day before, their attempt. Perhaps, during the days leading up to an attempt, NLEs are not unusual for these individuals and thus, do not have a triggering effect. Alternatively, planners may want to follow through with their previous suicide plan and, therefore, are not as impacted by the timing of NLEs. Future research should consider examining whether interpersonal NLEs are associated with key components of the IPT using an event-based suicide assessment, as well as identify potential triggers for the subgroup of attempters that plan their attempts.

Table 3
Conditional Logistic Regression Analyses Examining the any Interpersonal NLE-Suicide Attempt Relation as a Function of Current Suicide Planning and Psychiatric Symptoms

		Exposed *n* (%)				
	N	Day before	Day of attempt	*OR*	95% *CI*	*p*
IV = Interpersonal NLE						
Moderator: Suicide planning	93	25 (26.9)	48 (51.6)			.02
No plan subgroup	43	6 (14.0)	26 (60.5)	11.00**	2.59–46.78	
Plan subgroup	50	19 (38.0)	22 (44.0)	1.38	0.55–3.41	
Moderator: BPD	105	29 (27.6)	54 (51.4)			.59
No BPD subgroup	35	6 (17.1)	16 (45.7)	4.33*	1.23–15.21	
BPD subgroup	70	23 (32.9)	38 (54.3)	2.88*	1.29–6.43	
Moderator: Alcohol problems	109	30 (27.5)	55 (50.5)			.81
No alcohol problems subgroup	67	17 (25.4)	33 (49.3)	3.29**	1.41–7.66	
Alcohol problems subgroup	42	13 (31.0)	22 (52.3)	2.80*	1.01–7.77	
Moderator: Drug problems	106	28 (26.4)	54 (50.9)			.57
No drug problems subgroup	71	13 (18.3)	32 (45.1)	4.17**	1.71–10.16	
Drug problems subgroup	35	15 (42.9)	22 (62.9)	2.76	0.88–8.63	

Note. BPD = Borderline Personality Disorder; *OR* = Odds Ratio; *CI* = Confidence Interval; Exposed = presence of a NLE.

Third, the current study is unique due to its more refined examination of particular categories of NLEs as within-person triggers for suicide attempts. In particular, consistent with previous research (Conner et al., in press; Yen et al., 2005), the current study found that a specific type of interpersonal NLE—romantic/partner events—were triggers for suicide attempts. One potential interpretation of these findings is that the loss or disruption of certain interpersonal relationships may confer greater risk for suicide attempts than other relationships. That is, perhaps the impact of NLEs is proportionate to the perceived emotional bond or tolerability of interpersonal disruptions in romantic versus other relationships. It will be important for future studies to consider using larger event-based assessments to clarify the role of specific types of interpersonal NLEs as triggers for suicide attempts.

Although our romantic NLE findings were consistent with previous studies, our null crime/legal (or forensic) NLEs results were not (Cooper et al., 2002; Yen et al., 2005). It is possible that romantic NLEs are more proximal triggers for suicide attempts, whereas crime/legal NLEs are more distal risk factors. For instance, involvement in a court case (the most common crime/legal NLE reported by Yen et al., 2005) is a NLE that may take relatively more time to unfold and, therefore, may exert its influence over the days, weeks, or months, rather than hours, following the event. Therefore, although crime/legal NLEs may put an individual at risk for attempting suicide, these NLEs may not *trigger* the attempt. Alternatively, crime/legal NLEs may be relatively less common and the small number of crime/legal events reported in the current study may have been too small to detect an effect. Further replication with larger samples is needed.

Finally, given that NLEs, in general, have a greater etiological and pathological association with some psychiatric conditions (e.g., depression, substance disorders; Dohrenwend, 2006) than others, we also examined the effect of psychiatric symptoms on the NLE-suicide association. First, because the majority of participants reported significant depressive symptoms, we were unable to test how the NLE-attempt association was moderated by depression. Insofar as most participants met the threshold for significant depression, it stands to reason that the main study findings are not attributable solely to depression. We also wanted to ensure that psychological conditions characterized by trait impulsivity did not account for our observed moderation results by attempt planning. Because borderline personality disorder (BPD) and substance use disorder are two disorders characterized by high levels of trait impulsivity (Trull, Sher, Minks-Brown, Durbin, & Burr, 2000; Whiteside & Lynam, 2001), we conducted analyses with BPD features and problematic substance use replacing current suicide planning as moderators of the interpersonal NLE-suicide attempt relation. Results revealed that these variables were not significant moderators, and thus, do not account for the moderating role of attempt planning. In addition, we examined whether planning differed as a function of psychiatric group. The only difference was for BPD: Individuals with significant BPD features were *more* likely to plan their suicide attempt than those without BPD features ($OR = 2.59$, $p = .04$). These results are consistent with previous research indicating that individuals high in trait impulsivity do not necessarily engage in more impulsive (or less planned) suicide attempts (e.g., Baca-Garcia et al., 2005) and that the opposite direction of results has also been observed (e.g., Witte et al., 2008).

Taken together, findings from the current study have important implications for both suicide research and clinical work with suicidal patients. First, in regard to research design, there are numerous ways that cases and controls may differ and it is not feasible to control for all group differences using a standard case-control methodology. Importantly, the case-crossover design is an ideal solution to this problem because each case serves as its own control, thereby allowing for examination of factors that are unusual for the individual on the day of the suicide attempt. In addition, it is important to note that it is quite difficult, and arguably near impossible, to conduct longitudinal research on acute triggers on the days, and hours, immediately prior to a suicide attempt. Although some events (distal predictors) confer lifetime risk for suicide, results from the current study suggest that other events, specifically interpersonal events, may put an individual at heightened short-term risk for suicidal behavior. Second, the

TLFB method is similar to chain analysis used in dialectical behavior therapy (DBT; Linehan, 1993) to help patients with BPD understand the events, thoughts, and feelings that triggered engagement in self-injurious behaviors. Thus, the TLFB procedure may be useful clinically for highlighting the impact of individual triggers in an effort to prevent future suicidal behavior, and perhaps tell us *when* an individual may be more likely to attempt suicide. Moreover, the importance of interpersonal NLEs suggests that it may be essential to (a) target interpersonal effectiveness, a core component of DBT (Linehan, 1993), in which patients learn how to anticipate and effectively handle interpersonal conflict; and (b) include romantic partners and other significant social supports in treatment to enhance prevention efforts for at-risk patients.

Further, findings suggest that these interpersonal NLEs may hold significant relevance for those who do not report current planning for a suicide attempt. Currently, the presence of a suicidal plan is one index of increased risk for suicidal behavior (Beck et al., 1974). However, consistent with other studies (e.g., Borges et al., 2006), almost half of our sample reported little to no planning for their attempt. Results suggest that individuals without current suicide planning may still be at heightened risk for attempting suicide if an interpersonal NLE is likely to occur. Therefore, for patients who report no current suicide planning, clinicians may still consider enacting suicide preventative measures, such as creating a suicide safety plan for handling NLEs effectively. In addition, it has been suggested by others (e.g., Conner, 2004) that, given the small intervention window for attempters who do not make a suicide plan, more global efforts to restrict access to lethal means may be the most effective prevention strategy for at-risk individuals.

Although the current study adds to the growing literature examining the NLE-attempt association, there are limitations to this study that deserve comment and suggest areas for future research. First, although the case-crossover methodology holds all stable, and between-person, risk factors constant, there is a possibility that a third within-person variable (varying within days) could have caused both the NLE and suicide attempt. One possible contender is day-to-day fluctuations in negative affect. Research indicates that acute stressors produce negative affect (Dickerson & Kemeny, 2004) and that negative affect increases with daily stress (Watson, 1988). However, it is unclear whether daily fluctuations in negative affect are a precipitant and/or consequence of NLEs. Future research is needed to flesh out the temporality of these associations.

Second, both state and trait negative emotionality could have interfered with participants' recall of NLEs. For instance, participants may have been in a distressed state during the study assessment, which could have potentially biased their recall of NLEs. However, research indicates that emotional memories (e.g., significant NLEs) are remembered more accurately than neutral memories (Dolcos, LaBar, & Cabeza, 2004; Reisberg & Heuer, 1992). Therefore, the timing of the NLE assessment (close to the suicide attempt) is arguably beneficial to the current study because it minimized retrospective biases and forgetting that may have occurred if the assessment was weeks, months, or even years after the attempt. In addition, trait negative emotionality, such as depression, can impact recall of life events. Given that the majority of the sample reported significant depressive symptoms, it is unlikely that this recall bias contributed to the main study findings. However, given that the TLFB interview is based on self-report, future studies would benefit from also obtaining informant reports (and other records) about these NLEs that are not impacted by the attempters' biases.

Third, the current study used validated self-report screening measures to assess clinical symptoms. Future studies should replicate these findings with validated structured interviews to assess diagnostic features. Fourth, although suicide planning in the current study was operationalized using a method consistent with previous research (Baca-Garcia et al., 2001; Suominen et al., 1997), there is no agreed upon definition of what constitutes low current suicide planning (cutoffs range from 5 minutes to 24 hours; see review: Conner, 2004). Future research is needed to examine the significance of different conceptualizations of suicide planning on the NLE-suicide association.

Fifth, although the current study did not use the same assessment measure as Conner et al. (in press), we did (a) gather contextual information about the NLE to serve as anchors for recall, (b) use a measure that has demonstrated good interrater reliability in similar samples[3], and (c) confirm that each event was not simply a daily hassle and conformed to a predetermined list of events. However, unlike other standard assessment measures for NLEs (e.g., the Life Events and Difficulties Schedule; Brown & Harris, 1978), the current study did not use contextual details to judge whether the events met threshold for inclusion and to assess their severity. Therefore, included NLEs could have been impacted by participant reporting biases.

Finally, this study's design was not prospective. However, the current study's methodology does provide continuous hourly snapshots prior to the suicide attempt, quite close to when it happened. Therefore, the TLFB design may be a particularly good option for helping to pinpoint triggers for imminent risk of suicide attempts, as well as for aiding in the development of intervention strategies to help prevent future suicidal behavior.

[3] Using identical procedures to the current study, with the exception of adding financial compensation and audio taping interviews, we conducted a small study ($n = 77$) and determined the interrater reliability of the NLE categories. Twenty-two recent suicide attempters' interviews were randomly selected; one interviewer conducted all original TLFB interviews and a second interviewer reviewed the audiotape and provided independent ratings. Results indicated high percent agreement for having any NLE (Kappa = .82), any interpersonal NLE (Kappa = .81), and any noninterpersonal NLE (Kappa = .70).

References

Andresen, E. M., Malmgren, J. A., Carter, W. B., & Patrick, D. L. (1994). Screening for depression in well older adults: Evaluation of a short form of the CES-D (Center for Epidemiologic Studies Depression scale). *American Journal of Preventative Medicine, 10,* 77–84.

Baca-Garcia, E., Diaz-Sastre, C., Basurte, E., Prieto, R., Ceverino, A., Saiz-Ruiz, J., & de Leon, J. (2001). A prospective study of the paradoxical relationship between impulsivity and lethality of suicide attempts. *Journal of Clinical Psychiatry, 62,* 560–564. doi:10.4088/JCP.v62n07a11

Bagge, C. L., Nickell, A., Stepp, S., Durrett, C., Jackson, K., & Trull, T. (2004). Borderline Personality Disorder features predict negative outcomes two years later. *Journal of Abnormal Psychology, 113,* 279–288. doi:10.1037/0021-843X.113.2.279

Bagge, C. L., & Sher, K. J. (2008). Adolescent alcohol involvement and suicide attempts: Toward the development of a conceptual framework. *Clinical Psychology Review, 28,* 1283–1296. doi:10.1016/j.cpr.2008.06.002

Beautrais, A. L., Joyce, P. R., & Mulder, R. T. (1997). Precipitating factors and life events in serious suicide attempts among youths aged 13 through 24 years. *Journal of the American Academy of Child & Adolescent Psychiatry, 36,* 1543–1551.

Beck, A. T., Schuyler, D., & Herman, I. (1974). Development of the Suicide Intent Scales. In A. T. Beck, H. L. P. Resnik, & D. J. Lettieri (Eds.), *The prediction of suicide* (pp. 54–56). Bowie, MD: Charles Press.

Bohn, M. J., Babor, T. F., & Kranzler, H. R. (1991). Validity of the Drug Abuse Screening Test (DAST-10) in inpatient substance abusers: Problems of drug dependence. *Proceedings of the 53rd Annual Scientific Meeting, The Committee on Problems of Drug Dependence, Inc., DHHS Publication No. (ADM) 92–1888. NIDA Research Monograph, 119,* 233. Rockville, MD: Department of Health and Human Services.

Borges, G., Angst, J., Nock, M. K., Ruscio, A. M., Walters, E. E., & Kessler, R. C. (2006). Risk factors for twelve-month suicide attempts in the National Comorbidity Survey Replication (NCS-R). *Psychological Medicine, 36,* 1747–1757. doi:10.1017/S0033291706008786

Brent, D. A., Perper, J. A., Moritz, G., Baugher, M., Roth, C., Balach, L., & Schweers, J. (1993). Stressful life events, psychopathology, and adolescent suicide: A case control study. *Suicide and Life-Threatening Behavior, 23,* 179–187.

Brown, G. W., & Harris, T. O. (1978). *Social origins of depression: A study of psychiatric disorder in women*. New York, NY: The Free Press.

Cavanagh, J. T. O., Owens, D. G. C., & Johnstone, E. C. (1999). Life events in suicide and undetermined death in south-east Scotland: A case-control study using the method of psychological autopsy. *Social Psychiatry and Psychiatric Epidemiology, 34,* 645–650. doi:10.1007/s001270050187

Centers for Disease Control and Prevention (CDC). (2010). Web-based Injury Statistics Query and Reporting System (WISQARS). National Center for Injury Prevention and Control, CDC (producer). Available from URL: http://www.cdc.gov/%0d%0ainjury/wisqars/index.html www.cdc.gov/injury/wisqars/index.html

Cheng, A. T. A., Chen, T. H. H., Chen, C. C., & Jenkins, R. (2000). Psychosocial and psychiatric risk factors for suicide: Case-control psychological autopsy study. *The British Journal of Psychiatry, 177,* 360–365. doi:10.1192/bjp.177.4.360

Cocco, K. M., & Carey, K. B. (1998). Psychometric properties of the Drug Abuse Screening Test in psychiatric outpatients. *Psychological Assessment, 10,* 408–414. doi:10.1037/1040-3590.10.4.408

Conner, K. R. (2004). A call for research on planned vs. unplanned suicidal behavior. *Suicide and Life-Threatening Behavior, 34,* 89–98. doi:10.1521/suli.34.2.89.32780

Conner, K. R., Houston, R. J., Swogger, M. T., Conwell, Y., You, S., He, H., . . . Duberstein, P. R. (in press). Stressful life events and suicidal behavior in adults with alcohol use disorders: Role of event severity, timing, and type. *Drug and Alcohol Dependence*.

Conner, K. R., Phillips, M. R., & Meldrum, S. C. (2007). Predictors of low-intent and high-intent suicide attempts in rural China. *American Journal of Public Health, 97,* 1842–1846. doi:10.2105/AJPH.2005.077420

Cooper, J., Appleby, L., & Amos, T. (2002). Life events preceding suicide by young people. *Social Psychiatry and Psychiatric Epidemiology, 37,* 271–275. doi:10.1007/s001270200019

Dickerson, S. S., & Kemeny, M. E. (2004). Acute stressors and cortisol responses: A theoretical integration and synthesis of laboratory research. *Psychological Bulletin, 130,* 355–391. doi:10.1037/0033-2909.130.3.355

Dohrenwend, B. P. (2006). Inventorying stressful life events as risk factors for psychopathology: Toward resolution of the problem of intracategory variability. *Psychological Bulletin, 132,* 477–495. doi:10.1037/0033-2909.132.3.477

Dohrenwend, B. S., Krasnoff, L., Askenasy, A. R., & Dohrenwend, B. P. (1978). Exemplification of a method for scaling life events: The PERI Life Event Scale. *Journal of Health and Social Behavior, 19,* 205–229.

Dolcos, F., LaBar, K. S., & Cabeza, R. (2004). Interaction between the amygdala and the medial temporal lobe memory system predicts better memory for emotional events. *Neuron, 42,* 855–863.

Goldsmith, S. K., Pellmar, T. C., Kleinman, A. M., & Bunney, W. E. (2002). *Reducing suicide: A national imperative*. Washington, DC: National Academy Press.

Heikkinen, M., Aro, H., & Lonnqvist, J. (1992). Recent life events and their role in suicide as seen by the spouses. *Acta Psychiatrica Scandinavica, 86,* 489–494. doi:10.1111/j.1600-0447.1992.tb03303.x

Heikkinen, M. E., Henrikson, M. M., Isometsa, E. T., Marttunen, M. J., Aro, H. M., & Lonnqvist, J. K. (1997). Recent life events and suicide in personality disorders. *Journal of Nervous and Mental Disease, 185,* 373–381. doi:10.1097/00005053-199706000-00003

Hufford, M. R. (2001). Alcohol and suicidal behavior. *Clinical Psychology Review, 21,* 797–811. doi:10.1016/S0272-7358(00)00070-2

Joiner, T. E. (2005). *Why people die by suicide*. Cambridge, MA: Harvard University Press.

Kaslow, N. J., Jacobs, C. H., Young, S. L., & Cook, S. (2006). Suicidal behavior among low-income African American women: A comparison of first-time and repeat suicide attempters. *Journal of Black Psychology, 32,* 349–365. doi:10.1177/0095798406290459

Kessler, R. C., & Ustan, T. B. (2004). The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *The International Journal of Methods in Psychiatric Research, 13,* 93–121. doi:10.1002/mpr.168

Linehan, M. M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York, NY: Guilford Press.

Maclure, M., & Mittleman, M. A. (2000). Should we use a case-crossover design? *Annual Review of Public Health, 21,* 193–221. doi:10.1146/annurev.publhealth.21.1.193

Mann, J. J., Malone, K. M., Sweeney, J. A., Brown, R. P., Linnoila, M., Stanley, B., & Stanley, M. (1996). Attempted suicide characteristics and cerebrospinal fluid amine metabolites in depressed inpatients. *Neuropsychopharmacology, 15,* 576–586. doi:10.1016/S0893-133X(96)00102-9

Mann, J. J., Waternaux, C., Haas, G. L., & Malone, K. M. (1999). Toward a clinical model of suicidal behavior in psychiatric patients. *The American Journal of Psychiatry, 156,* 181–189.

Millon, T., & Davis, R. D. (1999). Developmental pathogenesis. In T. Millon, P. H. Blaney, & R. D. Davis (Eds.), *Oxford textbook of psychopathology* (pp. 29–48). New York, NY: Oxford University Press.

Morey, L. C. (1991). *The Personality Assessment Inventory professional manual*. Odessa, FL: Psychological Assessment Resources.

Nock, M. K., Borges, G., Bromet, E. J., Alonso, J., Angermeyer, M., Beautrais, A., . . . Williams, D. (2008). Cross-national prevalence and risk factors for suicidal ideation, plans, and attempts. *The British Journal of Psychiatry, 192,* 98–105. doi:10.1192/bjp.bp.107.040113

Nock, M. K., Holmberg, E. B., Photos, V. I., & Michel, B. D. (2007). The self-injurious thoughts and behavior interview: Development, reliability, and validity in an adolescent sample. *Psychological Assessment, 19,* 309–317. doi:10.1037/1040-3590.19.3.309

Reisberg, D., & Heuer, F. (1992). Remembering the details of emotional events. In E. Winograd & U. Neisser (Eds.), *Affect and accuracy in recall: Studies of 'flashbulb' memories* (pp. 162–190). New York, NY: Cambridge University Press. doi:10.1017/CBO9780511664069.009

Saunders, J. B., Aasland, O. G., Babor, T. F., de la Fuente, J. R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption. II. *Addiction, 88,* 791–804. doi:10.1111/j.1360-0443.1993.tb02093.x

Silverman, M. M., Berman, A. L., Sanddal, N. D., O'Carroll, P. W., & Joiner, T. E. (2007). Rebuilding the Tower of Babel: A revised nomenclature for the study of suicide and suicidal behaviors. Part II: Suicide-related ideations, communications, and behaviors. *Suicide and Life-Threatening Behavior, 37,* 264–277. doi:10.1521/suli.2007.37.3.264

Simon, T. R., Swann, A. C., Powell, K. E., Potter, L. B., Kresnow, M., & O'Carroll, P. W. (2001). Characteristics of impulsive suicide attempts and attempters. *Suicide and Life-Threatening Behavior, 32,* 49–59. doi:10.1521/suli.32.1.5.49.24212

Sobell, L. C., & Sobell, M. B. (1992). Timeline followback: A technique for assessing self-reported alcohol consumption. In R. Z. Litten & J. Allen (Eds.), *Measuring alcohol consumption: Psychosocial and biological methods* (pp. 41–72). Totowa, NJ: Humana Press. doi:10.1007/978-1-4612-0357-5_3

Stokes, M. E., Davis, C. S., & Koch, G. G. (2000). *Categorical data analysis using the SAS system,* Second edition. Cary, NC: SAS Institute, Inc.

Suominen, K., Isometsa, E., Henriksson, M., Ostamo, A., & Lonnqvist, J. (1997). Hopelessness, impulsiveness, and intent among suicide attempters with major depression, alcohol dependence, or both. *Acta Psychiatrica Scandinavica, 96,* 142–149. doi:10.1111/j.1600-0447.1997.tb09919.x

Trull, T. J., Sher, K. J., Minks-Brown, C., Durbin, J., & Burr, R. (2000). Borderline personality disorder and substance use disorders: A review and integration. *Clinical Psychology Review, 20,* 235–253. doi:10.1016/S0272-7358(99)00028-8

Vinson, D. C., Maclure, M., Reidinger, C., & Smith, G. S. (2003). A population-based case-crossover and case-control study of alcohol and the risk of injury. *Journal of Studies on Alcohol, 64,* 358–366.

Watson, D. (1988). Intraindividual and interindividual analyses of positive and negative affect: Their relations to health complaints, perceived stress, and daily activities. *Journal of Personality and Social Psychology, 54,* 1020–1030. doi:10.1037/0022-3514.54.6.1020

Weyrauch, K. F., Roy-Byrne, P., Katon, W., & Wilson, L. (2001). Stressful life events and impulsiveness in failed suicide. *Suicide and Life-Threatening Behavior, 31,* 311–319. doi:10.1521/suli.31.3.311.24240

Whiteside, S. P., & Lynam, D. R. (2001). The five factor model and impulsivity: Using a structural model of personality to understand impulsivity. *Personality and Individual Differences, 30,* 669–689. doi:10.1016/S0191-8869(00)00064-7

Witte, T. K., Merrill, K. A., Stellrecht, N. E., Bernert, R. A., Hollar, D. L., Schatschneider, C., & Joiner, T. E. (2008). "Impulsive" youth suicide attempters are not necessarily all that impulsive. *Journal of Affective Disorders, 107,* 107–116. doi:10.1016/j.jad.2007.08.010

Yen, S., Pagano, M. E., Shea, M. T., Grilo, C. M., Gunderson, J. G., Skodol, A. E., . . . Zanarini, M. C. (2005). Recent life events preceding suicide attempts in a personality disorder sample: Findings from the collaborative longitudinal personality disorders study. *Journal of Consulting and Clinical Psychology, 73,* 99–105. doi:10.1037/0022-006X.73.1.99

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