Psychiatry Research 242 (2016) 357–364

Contents lists available at ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

Suicide risk characteristics among aborted, interrupted, and actual suicide attempters

Taylor A. Burke*, Jessica L. Hamilton, Brooke A. Ammerman, Jonathan P. Stange, Lauren B. Alloy

Psychology Department, Temple University, Philadelphia, PA, USA

ARTICLE INFO

Article history:
Received 1 December 2015
Received in revised form
26 May 2016
Accepted 27 May 2016
Available online 9 June 2016

Keywords:
Belongingness
Burdensomeness
Suicidal ideation
Acquired capability
Non-suicidal self-injury
Behavioral forecast

ABSTRACT

Few studies have investigated suicide risk characteristics associated with interrupted and aborted suicide attempts. The present study aimed to empirically examine whether assessing a history of interrupted and aborted suicide attempts is valuable when assessing suicide risk, given the relative lack of literature in this area to date. To inform this question, the current study examined differences in risk factors for suicidal behavior among individuals who have carried out a suicide attempt, individuals who report having a history of only interrupted and/or aborted suicide attempts, and non-attempter controls. Approximately 447 undergraduates ($M=21.10$ years; $SD=4.16$; 77.6% female) completed measures of carried out suicide attempts, interrupted suicide attempts, aborted suicide attempts, acquired capability for suicide, suicide likelihood, depressive symptoms, suicidal ideation, and non-suicidal self-injury. Results suggest that a faction of individuals endorse interrupted and/or aborted suicide attempts (8.7%), but do not endorse carried out suicide attempts, even in non-clinical samples. Furthermore, results suggest that there are few clinically meaningful differences between those with a history of carried out suicide attempts and interrupted/aborted suicide attempts, suggesting that individuals with a history of these lesser studied suicidal behaviors are an important group to target for suicide risk intervention.

1. Introduction

A history of suicide attempts is regarded as one of the strongest predictors of future suicide (Suominen et al., 2004), which is the second leading cause of death among 10–24 year olds (CDC, 2015). Suicide attempts have been defined as any non-fatal self-directed behavior that is carried out with an associated intent to die, and that may or may not result in injury (Crosby et al., 2011). Over the past several decades, there has been a proliferation of research investigating risk factors for suicide attempts with the goal of informing suicide prevention. However, surprisingly few studies have investigated specific types of suicidal acts to attain a more fine-grained understanding of risk for future suicidal behavior.

Two relevant subtypes of suicidal acts include interrupted suicide attempts and aborted suicide attempts. Interrupted suicide attempts occur when individuals initiate action to end their lives but are stopped by *someone or something* external to the individual before actually carrying out the act. Aborted suicide attempts occur when individuals start to do something to try to end their lives but *stop themselves* before actually harming themselves (Posner et al., 2011). Surprisingly, few studies have examined prevalence estimates of these forms of suicide attempts among any population, but particularly among community samples. Moreover, although several commonly used clinical suicide risk assessment tools inquire about the occurrence of interrupted suicide attempts and aborted suicide attempts (e.g., Posner et al., 2011), there is a dearth of research to direct clinician understanding of risk among individuals who endorse these often regarded 'less severe' suicidal acts as compared to carried out suicide attempts.

Extant research that has measured and reported on the prevalence of these types of suicide attempts has offered preliminary evidence that interrupted and aborted suicide attempts are nearly just as prevalent as actual suicide attempts (Al Habeeb et al., 2013; Marzuk et al., 1997). In a psychiatric sample, interrupted suicide attempts (29.8%) and aborted suicide attempts (34.6%), measured separately, were approximately just as common as actual attempts (36.6%) over the past week (Al Habeeb et al., 2013). Further, another study found that 52.6% of psychiatric inpatients had a lifetime history of at least one aborted suicide attempt, whereas 50.4% had a lifetime history of at least one actual suicide attempt (Marzuk et al., 1997). However, the prevalence of interrupted suicide attempts and aborted suicide attempts in less severely ill populations remains unknown.

Despite the fact that these subtypes of suicidal acts have

* Corresponding author.
E-mail address: taylor.burke@temple.edu (T.A. Burke).

http://dx.doi.org/10.1016/j.psychres.2016.05.051
0165-1781/

received relatively scant attention in the literature, interrupted suicide attempts have been shown to be predictive of death by suicide (Steer et al., 1988). Specifically, Steer et al. (1988) found that among a sample of 499 individuals hospitalized for suicide attempts who were followed for 5–10 years, those with a history of an interrupted suicide attempt were three times more likely to die by suicide than those with a history of an actual suicide attempt. Although no studies to our knowledge have examined whether aborted suicide attempts prospectively predict suicide, research has demonstrated that aborted suicide attempts also are highly associated with actual suicide attempts (Marzuk et al., 1997; Barber et al., 1998). Indeed, individuals who have endorsed a history of at least one aborted suicide attempt were twice as likely to have made an actual suicide attempt in their lifetimes than individuals who did not indicate a history of an aborted suicide attempt (Barber et al., 1998).

Only very limited research has been performed with the goal of better understanding whether there are clinical differences between those who engage in carried out, or actual, suicide attempts versus those who engage in interrupted and/or aborted suicide attempts. Such studies suggest that these types of suicidal acts may not really be very different from one another. One study found that aborted suicide attempts and actual suicide attempts did not significantly differ in levels of lethality and intentionality ratings (Barber et al., 1998). Similarly, research has demonstrated that those with interrupted suicide attempts took significantly less precaution against getting caught than actual suicide attempters, but that overall suicide intent levels were the same between groups (Steer et al., 1988).

Overall, there is a current lack of information about how individuals with only either a history of interrupted or aborted suicide attempts may differ from individuals with a history of actual suicide attempts. As a result, it is unclear to what extent individuals with a history of solely these subtypes of suicidal acts (without a history of an actual suicide attempt) should be conceptualized in terms of risk level.

1.1. Interpersonal-psychological theory of suicide

The interpersonal-psychological theory of suicide (Joiner, 2005) is a model of suicidal behavior proposed to aid in the conceptualization of assessing risk for suicide. The interpersonal-psychological theory of suicide theorizes that in order to carry out a suicidal behavior, individuals have to exhibit both a high degree of suicidal desire and have developed a capability to carry out a self-directed lethal act. The theory holds that suicidal desire is best predicted by a high degree of perceived burdensomeness, defined as the thought that one is a burden on those around them, in conjunction with the experience of thwarted belongingness, defined as feeling socially isolated despite wanting connection with others (Joiner, 2005). This theory further suggests that suicidal desire must be accompanied by an acquired capability to enact suicidal plans in order to actually carry out suicidal behavior. Acquired capability for suicide is theorized to be attained through the habituation to the fear of death as well as to the physiological experience of pain (Joiner, 2005). This habituation is hypothesized to occur, in part, when faced with repetitive experiences of painful and provocative life events (Joiner, 2005).

Much literature has supported the interpersonal-psychological theory of suicide. For example, the interaction of belongingness and burdensomeness has been found to predict suicidal ideation (e.g., Kleiman et al., 2014). Furthermore, Van Orden et al. (2008) found that a greater number of suicide attempts predicted a greater acquired capability for suicide, measured via self-report. Researchers concluded that this finding supports the notion that repeated self-injurious behaviors increase risk for future suicidal self-injurious behaviors, and that this may occur, in part, due to the habituation to the pain and fear associated with carrying out lethal acts. However, no research to date has evaluated constructs of the interpersonal-psychological theory of suicide in relation to interrupted and aborted suicide attempts, which may yield crucial information regarding the clinical similarity between actual suicide attempts and these less investigated suicide attempts.

1.2. The current study

Clinicians would benefit from an empirically informed understanding of whether assessing a history of interrupted and aborted suicide attempts is useful when quantifying risk for suicidal behavior. The current study sought to inform this question by examining differences in risk factors for future suicidal behavior between individuals who have carried out a suicide attempt versus those individuals who have made only aborted and/or interrupted suicide attempts. We compared constructs from the interpersonal-psychological theory of suicide across three distinct groups of young adults (actual suicide attempters, interrupted/aborted suicide attempters, and non-attempting controls) to compare suicide risk. Specifically, we compared groups on levels of each of the three facets of the interpersonal-psychological theory of suicide: belongingness, burdensomeness, and acquired capability for suicide. We hypothesized that actual suicide attempters would evidence greater acquired capability levels than interrupted and/or aborted suicide attempters, given their likely greater exposure to carrying out lethal acts than those with an interrupted or aborted suicide attempt. However, we hypothesized that interrupted and/or aborted suicide attempters would exhibit elevated levels of acquired capability as compared to those without a history of any suicide attempts, due to the mental preparation and actions taken leading up to the interrupted or aborted suicide attempt. Furthermore, we hypothesized that both actual attempters and interrupted/aborted attempters would have developed suicidal desire to similar degrees, given previous literature suggesting that suicidal intent between interrupted and actual suicide attempts and between aborted and actual suicide attempts were not significantly different. Therefore, consistent with the interpersonal-psychological theory of suicide, we hypothesized that attempter groups would not evidence significantly different levels of perceived burdensomeness or of thwarted belongingness.

Finally, we compared groups on other research-supported indices of risk for future suicidal behavior to ensure that we captured relevant, potential differences between these groups, including depressive symptoms (Goldston et al., 2001), suicidal ideation (Beck, et al., 1999; Evans et al., 2005), self-reported predicted likelihood of attempting suicide in the future (Janis and Nock, 2008), and history of non-suicidal self-injury (Hamza et al., 2012).

2. Method

2.1. Participants and procedures

Study participants were Temple University students who were recruited to enroll in a psychology department study by advertising through class announcements and flyers distributed throughout campus. Individuals who were interested in the study were directed to access the Temple University online research system to enroll. Once enrolled, participants were instructed to complete an online questionnaire hosted by Fluid Surveys. Participants were considered officially enrolled once consent was obtained. The Temple University Institutional Review Board approved the procedures. All participants' questionnaires were reviewed and monitored for suicide risk

based on IRB-approved pre-determined cutoffs on measures of suicidal ideation and behavior. Participants who indicated that they may be at imminent risk for engaging in suicidal behavior (based on measures of suicidal ideation and behavior) were contacted by the lead researchers on this study to conduct a comprehensive suicide risk assessment. All participants who met these thresholds also were provided clinical referral information. Participants were debriefed at the completion of the study through information provided to them at the end of the survey.

Participants were 447 undergraduates (M=21.10 years; SD=4.16; 77.6% female) who completed all study questionnaires in exchange for research credit. The racial background of the participants was 58.8% (n=263) Caucasian, 20.4% (n=91) African American, 5.6% (n=25) East Asian, 4.0% (n=18) South Asian, 6.7% (n=30) Biracial, and 4.5% (n=20) Other.

2.2. Measures

2.2.1. Suicidal behavior

To assess history of actual suicide attempts, participants were asked, "Have you ever attempted to kill yourself?" To assess history of interrupted and aborted suicide attempts, we adapted prompts from the Columbia-Suicide Severity Rating Scale (Posner et al., 2011). To assess history of interrupted suicide attempts, participants were asked, "Has there been a time when you started to do something to end your life but *someone or something stopped you* before you actually did anything?" To assess history of aborted suicide attempts, participants were asked, "Has there been a time when you started to do something to try to end your life but *you stopped yourself* before you actually did anything?" For each subtype of suicide attempt a participant endorsed, participants were asked, "How many times has this happened?" Participants always were presented with the actual suicide attempt question first, followed by the interrupted and aborted suicide attempt questions. Each suicide attempt subtype was dichotomized as the presence (1) or absence (0) of a history of that particular subtype of suicide attempt.

Individuals were classified in the actual suicide attempt group if they endorsed an actual suicide attempt, whether or not they reported any interrupted or aborted attempts (i.e., if an individual reported both an actual suicide attempt and an interrupted or aborted attempt, they were coded as being in the actual suicide attempt group). Individuals were classified in the interrupted/aborted suicide attempt group if (a) they endorsed either an interrupted suicide attempt or aborted suicide attempt, without endorsing an actual suicide attempt or (b) endorsed both an interrupted suicide attempt and an aborted suicide attempt, without endorsing an actual suicide attempt. Individuals were classified in the non-attempter group if they denied a history of any suicide attempt.

2.2.2. Interpersonal-psychological theory of suicide risk measures

2.2.2.1. Acquired capability for suicide. The Acquired Capability for Suicide Scale (ACSS; Bender et al., 2007; Van Orden et al., 2008) is a self-report questionnaire that assesses fearlessness about death and pain tolerance, factors theorized to contribute to an individual's acquired ability to engage in a suicidal act. The original version of the ACSS includes 20 items rated on a scale from 0 (*not at all like me*) to 4 (*very much like me*). The current study utilized an abbreviated five-item version of the ACSS, which has been used in previous research (e.g., Bryan et al., 2010; Bryan and Cukrowicz, 2011; Fink-Miller, 2015; Van Orden et al., 2008). Some examples of items include, "People describe me as fearless" and "I can tolerate a lot more pain than most people." Total scores are summed, with higher scores reflecting a greater acquired capability for carrying out suicidal behaviors. In the current sample, α=.68, consistent with previous research (Bryan et al., 2010; Bryan and Cukrowicz, 2011; Fink-Miller, 2015; Van Orden et al., 2008)

2.2.2.2. Burdensomeness and belongingness. The Interpersonal Needs Questionnaire (INQ; Van Orden et al., 2012) is a 15-item self-report questionnaire that measures thwarted belongingness and perceived burdensomeness. Items measuring belongingness assess the degree to which individuals feel connected to others ("These days, I rarely interact with people who care about me."). Items measuring burdensomeness assess the degree to which individuals believe they are a burden on those around them (e.g., "These days, the people in my life would be better off if I were gone."). The items are scored on a Likert scale with higher scores indicative of more severe suicidal desire. This questionnaire has demonstrated convergent validity, divergent validity, and construct validity (Van Orden et al., 2012). The perceived burdensomeness (α=.96) and thwarted belongingness (α=.90) subscales demonstrated good to excellent reliability in the current sample.

2.2.3. Other suicide risk measures

2.2.3.1. Depressive symptoms. The Beck Depression Inventory-II (BDI-II; Beck et al., 1999) is a widely used self-report questionnaire that assesses the severity of symptoms of depression over the past two weeks on a 0–3 scale. Research has demonstrated that the BDI-II is valid for use among university student samples (Storch et al., 2004) (α=.95 in the current sample).

2.2.3.2. Suicidal ideation. The Beck Scale for Suicidal Ideation (BSS; Beck and Steer, 1991) was employed to assess current suicidal ideation. The BSS is a 21-item scale; however, for the purposes of this study, only the first 19 items that measure suicidal ideation were used, in line with scoring procedures (Beck and Steer, 1991). The BSS measures passive and active suicidal ideation over the previous week, as well as suicide plans, preparations, and access to means to carry out plans. Research has demonstrated that the BSS is highly correlated (r=.90) with an interview version of the self-report scale (Beck et al., 1988). The scale has been used among university students and has demonstrated adequate internal consistency, concurrent validity, and construct validity (Chioqueta and Stiles, 2006). In the present sample, α=.88.

2.2.3.3. Non-suicidal self-injury. The Deliberate Self Harm Inventory (DSHI; Gratz, 2001) is a self-report questionnaire that measures the frequency and methods of NSSI behaviors (e.g., cutting, carving, burning, biting, head-banging). The DSHI inquires how many times an individual has engaged in each of 16 NSSI behaviors. An example prompt is, "Have you ever intentionally (i.e., on purpose) burned yourself?" An additional prompt asks participants if they have engaged in any additional self-injurious behavior not asked about. We modified the DSHI to add the clause, "without intending to kill yourself" to each of the 17 prompts to ensure participants did not endorse suicidal self-injurious behaviors within this questionnaire. If participants answer positively to any of the 17 prompts, they are instructed to document the number of times they have engaged in each NSSI method endorsed. In order to minimize the variability in NSSI frequency, we classified endorsed NSSI frequency into categories (0, 1, 2–5, 6–20, 21–50, and 51+ NSSI acts; Burke et al., 2015; Cohen et al., 2015; Whitlock et al., 2013). Number of NSSI methods was calculated by summing positively endorsed methods. The DSHI has been used in university-student samples often and has evidenced test-retest reliability, and construct, discriminant, and convergent validity (Gratz, 2001; Fliege et al., 2006).

2.2.3.4. Suicide likelihood. To assess self-reported suicide attempt likelihood, we adapted the behavioral forecast question from the

Self-Injurious Thoughts and Behaviors Interview (SITBI; Nock et al., 2007). Participants were asked, "On the scale of 0 to 4, what do you think the likelihood is that you will attempt suicide in the future?" where 0 indicates low/little and 4 indicates very much/severe.

2.3. Data analytic plan

Chi square tests were conducted for categorical dependent variables (sex, race) and one-way ANOVAs were conducted for continuous variables (age) to determine whether there were differences between the three groups (actual suicide attempters, interrupted/aborted suicide attempters without a history of actual suicide attempts, and those who had no history of any form of suicide attempt). Means and standard deviations or frequencies for each demographic measure were calculated across groups.

Primary study outcomes for all analyses included interpersonal-psychological theory of suicide variables (thwarted belongingness, perceived burdensomeness, acquired capability for suicide) and indices of risk for future suicidal behavior (current depressive symptoms, current suicidal ideation, self-reported predicted likelihood of attempting suicide in the future, and history of non-suicidal self-injury). To determine whether parametric or nonparametic tests were required, we examined the homogeneity of variance for study variables using Levene's Test. In the event that Levene's test was non-significant, a multiple analysis of variance (MANOVA) was conducted to determine differences in these variables across groups. Post-hoc comparisons were examined using Tukey's HSD. If Levene's test was significant, we conducted a non-parametric Kruskal-Wallis Test to examine univariate main effects of each dependent variable and conducted Mann-Whitney pairwise comparisons with a Bonferroni correction. Violations of homogeneity of variance were noted for all variables except belongingness and acquired capability for suicide.

3. Results

3.1. Preliminary and demographic analyses

Overall, 6.9% ($n=31$) of the sample endorsed an actual suicide attempt and 8.7% ($n=39$) of the sample endorsed an interrupted and/or an aborted suicide attempt but no actual suicide attempt; 84.3% ($n=377$) of the sample endorsed no history of any suicide attempt. Of those reporting an actual suicide attempt, 58.1% ($n=18/31$) also reported an interrupted suicide attempt and 71% ($n=22/31$) also reported an aborted suicide attempt. Of the 39 individuals who reported only an interrupted and/or aborted suicide attempt, 30.76% ($n=12/39$) reported *both* an interrupted and an aborted suicide attempt, 35.9% ($n=14/39$) reported only an interrupted suicide attempt, and 35.9% ($n=14/39$) reported only an aborted suicide attempt. Bivariate correlations among primary study variables and descriptive statistics for the study sample are presented in Table 1. In addition, there were no significant differences by gender ($\chi^2=4.94$, $p=.08$), race ($\chi^2=16.13$, $p=.10$) or age ($F(2)=.74$, $p=.48$) across groups by suicide attempt status.

3.2. Risk factors based on suicide attempt status

First, based on our tests of homogeneity of variance, a MANOVA was conducted for thwarted belongingness and acquired capability for suicide across attempt groups. These analyses revealed that there were significant differences between groups for both thwarted belongingness and acquired capability for suicide (Table 2). Our post-hoc comparisons using Tukey's HSD indicated that individuals without any suicide attempt history reported a lower experience of thwarted belongingness than those with an actual suicide attempt ($p<.001$, $d=.83$) or with an interrupted/aborted suicide attempt ($p<.01$, $d=.55$). However, there were no significant differences between those with an interrupted/aborted suicide attempt compared to those reporting an actual suicide attempt on thwarted belongingness ($p=.71$, $d=.18$). In terms of acquired capability for suicide, there was a significant difference between individuals without any suicide attempt history and those reporting an interrupted/aborted suicide attempt ($p<.001$, $d=.76$), such that individuals with an interrupted/aborted suicide attempt had greater capability for suicide. Surprisingly, there were no significant differences between individuals with an actual suicide attempt history and no suicide attempt history on levels of acquired capability for suicide ($p=.48$, $d=.20$). Furthermore, there was a trending difference between those with an actual suicide attempt and those with an interrupted/aborted suicide attempt, such that those with an interrupted/aborted suicide attempt evidenced elevated scores on a measure assessing acquired capability for suicide ($p=.054$, $d=.51$).

Table 1
Bivariate correlations between primary study variables.

	Measure	1	2	3	4	5	6	7	8
1	BDI	–	.34	.33	.50	.51	.47	.11	.26
2	Num NSSI Methods		–	.83	.30	.31	.28	.12	.21
3	NSSI Frequency			–	.27	.28	.27	.12	.21
4	Suicidal Ideation				–	.51	.29	.16	.62
5	INQ- Burden					–	.60	.14	.35
6	INQ- Belong						–	.07	.24
7	ACSS							–	.04
8	Suicide Likelihood								–
	Mean	10.95	0.58	0.93	1.23	10.73	23.57	7.75	0.13
	SD	11.24	1.08	1.55	3.51	7.94	11.26	4.39	0.48

Note. Total N=447. All coefficients greater than .10 are significant at $p<.05$. BDI=Beck Depression Inventory; NSSI=Non-Suicidal Self-Injury; INQ=Interpersonal Neediness Questionnaire; ACSS=Acquired Capacity for Suicide.

Second, we conducted a non-parametric Kruskal-Wallis Test for the risk factors that did not meet normality assumptions of variance. There were significant differences across the groups on current depressive symptoms, NSSI frequency and number of methods, current suicidal ideation, burdensomeness, and self-reported likelihood of attempting suicide in the future (Table 2). Pairwise comparisons with a Bonferroni correction of alpha = .006 indicated that there were significant differences between individuals without a suicide attempt history and those with an actual suicide attempt or interrupted/aborted suicide attempt in the expected direction on current depressive symptoms ($ds=.76$ and .73, respectively), number of NSSI methods ($ds=.80$ and .81, respectively), NSSI frequency ($ds=.93$ and .93, respectively), current suicidal ideation ($ds=.81$ and .77, respectively) and burdensomeness ($ds=.67$ and .56, respectively) ($p<.001$ for all comparisons). Furthermore, there were significant differences between those with an actual suicide attempt or interrupted suicide attempt/aborted suicide attempt and those with no suicide attempt history on suicide likelihood ($p<.01$, $d=.46$ and $p<.001$, $d=.56$ respectively). Importantly, there were no significant differences between individuals with an actual suicide attempt versus an interrupted suicide attempt/aborted suicide attempt on depressive symptoms ($d=.03$), NSSI frequency ($d=.02$), NSSI number of methods ($d=.14$), current suicidal ideation ($d=.02$), and burdensomeness ($d=.16$), indicating no differences between these groups on any of the risk factors included in the present study.

4. Discussion

The current study examined a unique group of individuals at risk for future suicidal behavior: those with past interrupted and

Table 2
Group differences in suicide risk characteristics.

Outcome	ISA/ASA (N=39) *M (SD)*	SA only (N=32) *M (SD)*	No SA (N=377) *M (SD)*	*F/H*	*p*
BDI	18.35 (13.83) [a]	18.74 (13.80) [a]	9.54 (10.12)	30.07	< .001
Suicidal Ideation	3.96 (5.58) [a]	4.68 (6.63) [a]	0.66 (2.42)	71.38	< .001
Num NSSI Methods	1.33 (1.32) [a]	1.55 (1.79) [a]	0.42 (0.90)	45.77	< .001
NSSI Frequency	2.28 (2.05) [a]	2.29 (2.07) [a]	0.68 (1.29)	48.75	< .001
INQ Burdensomeness	14.59 (9.57) [a]	16.23 (11.40) [a]	9.88 (7.09)	29.73	< .001
INQ Belongingness	28.92 (12.79) [a]	31.00 (9.88) [a]	22.41 (10.82)	13.94	< .001
ACSS	10.72 (4.47) [a]	8.32 (4.98)	7.39 (4.21)	10.91	< .001
Suicide Likelihood	0.41 (0.75) [a]	0.39 (0.88) [a]	0.08 (0.38)	28.69	< .001

Note.
ASA=Aborted Attempt; ISA=Interrupted Attempt; SA=Suicide Attempt; BDI=Beck Depression Inventory; NSSI=Non-Suicidal Self-Injury; INQ=Interpersonal Neediness Questionnaire; ACSS=Acquired Capacity for Suicide.

[a] Significantly different from those without a history of any suicide attempt.

aborted suicide attempts. We examined levels of suicide risk as proposed by the interpersonal-psychological theory of suicide, including suicidal desire and acquired capability, in addition to several supported suicide risk-indices, among those with a history of an interrupted/aborted suicide attempt, an actual suicide attempt, and non-attempting controls. Our hypotheses were partially supported. As expected, individuals with an interrupted/aborted suicide attempt and individuals with an actual suicide attempt reported similar levels of suicidal desire; surprisingly, however, there were no significant differences between these groups on levels of acquired capability for suicide. Further, those with an interrupted/aborted suicide attempt and those with an actual suicide attempt reported comparable levels of several additional suicide risk factors. Overall, our findings suggest that individuals reporting a history of an interrupted and/or aborted suicide attempt without a history of an actual suicide attempt may not significantly differ from those with a history of an actual suicide attempt.

The current study is the first study, to our knowledge, to examine interrupted suicide attempts and aborted suicide attempts in a non-clinical sample. As expected, there were lower rates of individuals who endorsed an interrupted/aborted suicide attempt (with no actual suicide attempt; ~10%) in comparison to previous research in psychiatric samples (Al Habeeb et al., 2013; Marzuk et al., 1997). However, as found in psychiatric samples, over half of those with an interrupted and/or aborted suicide attempt also reported a history of an actual suicide attempt. This highlights that interrupted and aborted suicide attempts may serve as significant risk factors for actual suicide attempts, even in a community sample. However, given that we did not collect temporal information for these suicide attempts, we cannot infer causality from this relationship and future research should examine this further. Although interrupted and/or aborted suicide attempts appear to be associated with increased suicide risk, we also found that there were a significant proportion of participants reporting an interrupted and/or aborted suicide attempt without a history of an actual suicide attempt, who may be at risk for later suicidal behavior. Thus, there is a subgroup of individuals at high-risk for suicidality that may not be detected by many standard suicide risk screenings (e.g., Lifetime Parasuicide Count; Suicidal Behavior Questionnaire-Revised; Linehan and Comtois, 1996; Osman et al., 2001) or routinely assessed in clinical settings. It appears these individuals may be at increased risk for suicidal behavior as suggested both by the high overlap in interrupted suicide attempts, aborted suicide attempts, and actual suicide attempts, in addition to the exhibited comparable elevated levels of well-known suicide risk factors. Thus, our findings highlight the importance of identifying individuals who have interrupted and aborted suicide attempts in non-clinical samples as well.

In relation to the interpersonal-psychological theory of suicide (Joiner, 2005), we examined the concepts of suicidal desire (e.g. belongingness, burdensomeness) and acquired capability. As hypothesized, individuals with no history of suicidal behavior reported lower suicidal desire (lower levels of thwarted belongingness and lower levels of perceived burdensomeness) than those with an interrupted/aborted suicide attempt or an actual suicide attempt, whereas there were no differences between these latter two groups. It is not surprising that these two attempting groups reported comparable levels of suicidal desire. Both high levels of thwarted belongingness and high levels of burdensomeness have been widely associated with suicidal ideation (Joiner et al., 2009; Van Orden et al., 2008), which were not expected to differ between these groups. Further, previous research has suggested that individuals with aborted suicide attempts (Barber et al., 1998) and interrupted suicide attempts (Steer et al., 1988) did not differ in their intent to die in planning their attempt in relation to those who carried out the act.

Findings related to acquired capability for suicide were unexpected, however. Individuals with an interrupted/aborted suicide attempt reported higher levels of acquired capability than individuals with no history of suicide attempts; however, those with an actual suicide attempt reported comparable levels of acquired capability to those with no suicide attempts and those with an interrupted/aborted suicide attempt. These latter findings are contrary to the extant literature supporting the role of increased acquired capability in suicide attempters compared to non-attempters (e.g., Anestis and Joiner, 2011; Joiner, 2005; Van Orden et al., 2008). Given that we did not collect date of suicide attempt, a limitation of the current study, it is possible that those reporting an actual suicide attempt may not have had a recent attempt. There has been little research examining the duration of acquired capability. That is, for individuals who attempted suicide several years prior to the assessment, the increased level of acquired capability that they had at the time of the attempt may have diminished in years since, if they have not further engaged in painful or provocative behavior/events. However, given that the majority of research to date has utilized comparable data collection methods, this may not be a driving factor in our contradictory results. Furthermore, literature explicating the theory of acquired capability has conceptualized it as a risk factor that once acquired, remains stable (Joiner, 2005). Another possibility for the unexpected results is that previous studies have indicated that *number* of suicide attempts predicts elevated acquired capability, as opposed to the *presence* of a suicide attempt (Van Orden et al., 2008). Indeed, multiple attempters have been found to be psychiatrically distinct from single attempters (Pagura et al., 2008), as well as have a greater intent to die during the attempt and greater risk for future suicide attempt (Miranda et al., 2008). Thus, it may

be that the occurrence of a singular episode (e.g., one attempt) does not significantly contribute to acquired capability, but that instead multiple attempts may have a greater influence on one's capacity for suicide. Therefore, had we also examined multiple versus single suicide attempts, the effect of acquired capability may have been present; although nearly half of those reporting any type of suicide attempt reported multiple attempts in our study, due to our limited sample size, these analyses were not possible.

It is also of note that the current study used an abbreviated measure of acquired capability, which demonstrated acceptable reliability in the current sample; inclusion of the full-length measure in future work would support the current findings. Furthermore, the included measure captures two, albeit important, aspects of acquired capability, fearlessness about death and pain tolerance, but more recent theories of suicide (Klonsky and May, 2015; O'Connor, 2011) have implicated additional factors as contributing to acquired capability (e.g., access to social models of suicidality, access to lethal means). Further exploration of all proposed facets of acquired capability may be particularly helpful to disentangle group differences. We were not surprised that those with interrupted and/or aborted suicide attempts reported higher levels of acquired capability than those without a history of suicidal behavior. Leading up to an interrupted/aborted suicide attempt, one must both mentally prepare and rehearse the planned attempt, in addition to taking physical steps to prepare, which may aid in the habituation to the fear associated with death (e.g., Joiner, 2005). As anticipated, individuals without a history of suicide attempts reported lower levels of the remaining risk factors (e.g. current suicidal ideation, self-predicted suicide risk, depressive symptoms, NSSI frequency and number of methods) as compared to the suicide attempt groups (interrupted/aborted suicide attempt and suicide attempt groups). Further, those with an interrupted and/or aborted suicide attempt were comparable to individuals with an actual suicide attempt on each of these suicide risk indices.

The findings of the current study should be viewed in the context of its limitations, however. First, the current study relied solely on self-reports of past behavior; therefore, we cannot be certain that participants were correctly categorizing their past behavior. That is, participants may not have been able to discern whether their past behavior would be classified as an interrupted suicide attempt, aborted suicide attempt, or actual suicide attempt. For example, it is possible that participants may have classified an aborted suicide attempt as an interrupted suicide attempt because of the potentially confounding wording employed in the interrupted suicide attempt question referring to "*someone or something*" stopping the attempt before it had occurred. Indeed, although the term "*something*" was intended to apply to only external sources, it is possible that a participant may have classified an internal change of heart as an interrupted suicide attempt. Of note, for the purposes of the current study, this potential misclassification error would not affect the results given that we combined the interrupted and aborted suicide attempt groups. However, future research would benefit from incorporating interview data to elicit more details about each behavior to ensure accurate behavior classification across forms of suicide attempts. It is important to note, however, that 39 participants self-reported an interrupted and/or aborted suicide attempt after responding that they had not attempted suicide, which was asked in a standardized form akin to many self-report and interview-based studies. Therefore, these 39 individuals would be overlooked in many studies examining suicidal behavior.

A second important limitation of the present study is that we were unable to adequately separately examine the interrupted suicide attempts and aborted suicide attempts due to low sample size of each of these groups; thus, we combined these into one category. Given the limited research in this area, it is unclear how similar or dissimilar these individuals may be from one another. However, there may be important differences between those who abort a suicide attempt (and therefore may no longer wish to die by suicide) and those who are interrupted by an external source (and might have completed an actual suicide attempt without the interruption). Specifically, individuals who aborted an attempt may have lower acquired capability for suicide and future suicide likelihood given that they stopped themselves, whereas those with an interrupted attempt may have greater levels of acquired suicide capability and suicide likelihood than aborted suicide attempts. In this sense, aborted suicide attempts may be more distinct from interrupted suicide attempts and actual suicide attempts, whereas interrupted suicide attempt and actual suicide attempt individuals may be more similar, thereby accounting for our lack of significant differences between suicide attempt and interrupted/aborted suicide attempt groups. Indeed, there appear to be unique individuals in the interrupted/aborted suicide attempt groups, with approximately one-third of individuals reporting solely an interrupted suicide attempt and one-third of individuals reporting solely an aborted suicide attempt. However, this remains an important avenue for future research, as this distinction was not able to be a focus of analyses due to the limited sample size in the current study.[1] Future studies with larger samples should examine these two groups of individuals separately to gain more nuanced information.

Third, although the current study asked about attempts to kill oneself, it did not specifically assess suicidal intent (i.e., intention to die) at the time of suicide attempt, which may be an important factor to consider in future work as it has been associated with method lethality among actual suicide attempts (Hamdi et al., 2007). Although past research has not found differences in suicidal intent between those with interrupted suicide attempts or aborted suicide attempts and actual suicide attempts (Barber et al., 1998; Steer et al., 1988), intent may differ among those in the actual suicide attempt group. For example, Nock and Kessler (2006) found that of those who reported having attempted to kill themselves, when asked about intent, approximately 40% reported no intent to die at the time of suicide attempt. Furthermore, additional descriptive information about attempts (e.g., method used, number of attempts) would be informative in future work given their implications in risk assessment.

Fourth, the current study is limited in its generalizability because the study sample consisted entirely of undergraduates. Specifically, although rates of suicide attempts are relatively high in undergraduate samples (Klonsky et al., 2013; Toprak et al., 2011), it is possible that the suicide attempt characteristics (i.e., suicide intent, medical lethality) may have been significantly less severe than exhibited in inpatient and outpatient settings. As a result, it is unclear whether the current results would replicate in clinical samples or in alternate community samples. In addition, the present study was cross-sectional and did not examine future suicidal ideation and behaviors, which would be important in determining the predictive validity of these groups for future behavior. Therefore, future research is needed to examine interrupted and aborted suicide attempts with a longitudinal design to determine whether certain suicide attempts are more predictive of future suicidal behavior than others.

[1] Employing MANOVA and Kruskal-Wallis tests when appropriate, we conducted post-hoc exploratory analyses to compare the actual suicide attempt group to those who reported only aborted suicide attempts (n=14) and those who reported only interrupted suicide attempts (n=14) and found no significant group differences. Given the very small group sample sizes, we do not consider this analysis to be well powered enough to make strong conclusions and thus did not include these findings in our results section.

Finally, the relatively small sample sizes for the interrupted/aborted suicide attempt and actual suicide attempt groups may have reduced the likelihood of detecting significant differences between these groups. However, we believe that this possibility is unlikely based on calculated effect sizes for the non-significant group differences between the aborted suicide attempt/interrupted suicide attempt and actual suicide attempt groups, which ranged from very small to small on all suicide risk characteristics (Cohen's ds ranging from .03 to .18) except for acquired capability for suicide, which evidenced a medium effect size and a corresponding trending group difference (Cohen's $d=.51$; $p=.053$). Despite these limitations, the current study makes significant contributions to the literature by being one of the first studies to examine the presence and risk correlates of interrupted and aborted suicide attempts (when unaccompanied by actual suicide attempts) in a non-clinical sample.

The current findings have important implications for suicide risk assessment. In combination with previous literature, the overlap of interrupted/aborted suicide attempts and actual suicide attempts as well as their comparable associated levels of suicide risk indicators highlight the importance of assessing for these "less severe" forms of attempted suicide. However, most suicide risk screening measures do not inquire about interrupted or aborted suicide attempts, focusing primarily on suicidal ideation, plans, and actual suicide attempts. Therefore, it may be important for new self-report screening measures to be developed to incorporate these impeded attempts. Furthermore, our findings demonstrate that the two groups of attempters examined in this study do not differ on levels of suicidal desire, suggesting that interventions for reducing suicide risk for individuals with a history of an interrupted/aborted suicide attempt and for individuals with a history of an actual suicide attempt may benefit from including modules designed to increase connectedness, or feelings of belongingness, and to dispel misbeliefs about burdensomeness.

Acknowledgements

Taylor A. Burke was supported by a National Science Foundation Graduate Research Student Fellowship. Jessica L. Hamilton was supported by National Research Service Award F31MH106184 from NIMH. Brooke Ammerman was supported by National Research Service Award F31MH107156 from NIMH. Lauren B. Alloy was supported by the National Institute of Mental Health grant MH77908. The funding sources had no role in study design, in the collection, analysis and interpretation of data, in the writing of the report, or in the decision to submit the article for publication.

References

Al-Habeeb, A.A., Sherra, K.S., Al-Sharqi, A.M., Qureshi, N.A., 2013. Assessment of suicidal and self-injurious behaviours among patients with depression. East. Mediterr. Health J. 19, 248.
Anestis, M.D., Joiner, T.E., 2011. Examining the role of emotion in suicidality: Negative urgency as an amplifier of the relationship between components of the interpersonal–psychological theory of suicidal behavior and lifetime number of suicide attempts. J. Affect. Disord. 129, 261–269.
Barber, M.E., Marzuk, P.M., Leon, A.C., Portera, L., 1998. Aborted suicide attempts: a new classification of suicidal behavior. Am J Psychiatry. 155, 385–389.
Beck, A.T., Brown, G.K., Steer, R.A., Dahlsgaard, K.K., Grisham, J.R., 1999. Suicide ideation at its worst point: a predictor of eventual suicide in psychiatric outpatients. Suicide Life Threat 29, 1–9.
Beck, A.T., Steer, R.A., Brown, G.K., 1999. Manual for the Beck Depression Inventory, Second Edition The Psychological Association, San Antonio, TX.
Beck, A.T., Steer, R.A., Ranieri, W.F., 1988. Scale for suicide ideation: psychometric properties of a self-report version. J Clin Psychol. 44, 499–505.
Beck, A., Steer, R., 1991. Beck Scale for Suicide Ideation Manual. Harcourt Brace, San Antonio, TX.
Bender, T.W., Gordon, K.H., Joiner, T.E., 2007. Impulsivity and suicidality: a test of the mediating role of painful experiences. Unpublished manuscript.
Fink-Miller, E.L., 2015. Provocative work experiences predict the acquired capability for suicide in physicians. Psychiatry Res. 229, 143–147.
Bryan, C.J., Cukrowicz, K.C., West, C.L., Morrow, C.E., 2010. Combat experience and the acquired capability for suicide. J. Clin. Psychol. 66, 1044–1056.
Bryan, C.J., Cukrowicz, K.C., 2011. Associations between types of combat violence and the acquired capability for suicide. Suicide Life Threat 41, 126–136.
Burke, T.A., Stange, J.P., Hamilton, J.L., Cohen, J.N., O'Garro-Moore, J., Daryanani, I., Abramson, L.Y., Alloy, L.B., 2015. Cognitive and emotion-regulatory mediators of the relationship between behavioral approach system sensitivity and non-suicidal self-injury frequency. Suicide Life Threat 45, 495–504.
Centers for Disease Control and Prevention (CDC), 2015. Web-based Injury Statistics Query and Reporting System (WISQARS) [Online interactive database]. Retrieved from ⟨http://www.cdc.gov/injury/wisqars/index.html⟩.
Chioqueta, A.P., Stiles, T.C., 2006. Psychometric properties of the Beck Scale for suicide ideation: a Norwegian study with university students. Nord. J. Psychiatry. 60, 400–404.
Cohen, J.N., Heimberg, R.G., Burke, T.A., Hamilton, J.L., Jenkins, A., Alloy, L.B., 2015. The interaction of affective states and cognitive vulnerabilities in the prediction of non-suicidal self-injury. Cogn. Emot. 29, 539–547.
Crosby, A.E., Ortega, L., Melanson, C., 2011. Self-Directed Violence Surveillance: Uniform Definitions and Recommended Data Elements. Centers for Disease Control and Prevention, Atlanta, GA.
Evans, E., Hawton, K., Rodham, K., Deeks, J., 2005. The prevalence of suicidal phenomena in adolescents: a systematic review of population-based studies. Suicide Life Threat 35, 239–250.
Fliege, H., Kocalevent, R., Walter, O.B., Beck, S., Gratz, K., Gutierrez, P., Klapp, B.F., 2006. Three assessment tools for deliberate self-harm and suicide behavior: evaluation and psychopathological correlates. J. Psychosom. Res. 61, 113–121.
Goldston, D.B., Daniel, S.S., Reboussin, B.A., Reboussin, D.M., Frazier, P.H., Harris, A.E., 2001. Cognitive risk factors and suicide attempts among formerly hospitalized adolescents: a prospective naturalistic study. J. Am. Acad. Child. Adolesc. Psychiatry. 40, 91–99.
Gratz, K.L., 2001. Measurement of deliberate self-harm: preliminary data on the deliberate self-harm inventory. J. Psychopathol. Behav. Assess. 23, 253–263.
Hamdi, E., Amin, Y., Matter, T., 2007. Clinical correlates of intent in attempted suicide. Acta Psychiatr. Scand. 83, 406–411.
Hamza, C.A., Stewart, S.L., Willoughby, T., 2012. Examining the link between nonsuicidal self-injury and suicidal behavior: A review of the literature and an integrated model. Clin. Psychol. Rev. 32, 482–495.
Janis, I.B., Nock, M.K., 2008. Behavioral forecasts do not improve the prediction of future behavior: a prospective study of self-injury. J. Clin. Psychol. 64, 1164–1174.
Joiner, T.E., Conwell, Y., Fitzpatrick, K.K., Witte, T.K., Schmidt, N.B., Berlim, M.T., Fleck, M.P.A., Rudd, M.D., 2005. Four studies on how past and current suicidality relate even when "everything but the kitchen sink" is covaried. J. Abnorm. Psychol. 114, 291–303.
Joiner, T.E., Van Orden, K.A., Witte, T.K., Selby, E.A., Ribeiro, J., Lewis, R., Rudd, M.D., 2009. Main predictions of the interpersonal-psychological theory of suicidal behavior: empirical tests in two samples of young adults. J. Abnorm. Psychol. 118, 634–646.
Kleiman, E.M., Riskind, J.H., Stange, J.P., Hamilton, J.L., Alloy, L.B., 2014. Cognitive and interpersonal vulnerability to suicidal ideation: a weakest link approach. Behav. Ther. 45, 778–790.
Klonsky, E.D., May, A.M., 2015. The Three-Step Theory (3ST): a new theory of suicide rooted in the "ideation-to-action" framework. Int. J. of Cogn. Ther 8, 114–129.
Klonsky, E.D., May, A.M., Glenn, C.R., 2013. The relationship between nonsuicidal self-injury and attempted suicide: converging evidence from four samples. J. Abnorm. Child. Psychol. 122, 231–237.
Linehan, M.M., Comtois, K.A., 1996. Lifetime Parasuicide Count. Unpublished manuscript.
Marzuk, P.M., Tardiff, K., Leon, A.C., Portera, L., Weiner, C., 1997. The prevalence of aborted suicide attempts among psychiatric in-patients. Acta Psychiatr. Scand. 96, 492–496.
Miranda, R., Scott, M., Hicks, R., Wilcox, H.C., Mufakh, J.L.H., Shaffer, D., 2008. Suicide attempt characteristics, diagnoses, and future attempts: comparing multiple attempters to single attempters and ideators. J. Am. Acad. Child. Adolesc. Psychiatry 47, 32–40.
Nock, M.K., Holmberg, E.B., Photos, V.I., Michel, B.D., 2007. Self-injurious thoughts and behaviors interview: development, reliability, and validity in an adolescent sample. Psychol. Assess. 19, 309–317.
Nock., M.K., Kessler, R.C., 2006. Prevalence of and risk factors for suicide attempts versus suicide gestures: analysis of the national comorbidity survey. J. Abnorm. Psychol. 115, 616–623.
O'Connor, R.C., 2011. Towards an integrated motivational–volitional model of suicidal behaviour. In: O'Connor, R.C., Platt, S., Gordon, J. (Eds.), International Handbook of Suicide Prevention: Research, Policy and Practice. Wiley-Blackwell, Hoboken, NJ, pp. 181–198.
Osman, A., Bagge, C.L., Gutierrez, P.M., Konick, L.C., Kopper, B.A., Barrios, F.X., 2001. The Suicidal Behaviors Questionnaire-Revised (SBQ-R): validation with clinical and nonclinical samples. Assessment 8, 443–454.
Pagura, J., Cox, B.J., Sareen, J., Enns, M.W., 2008. Factors associated with multiple versus single episode suicide attempts in the 1990-1992 and 2001-2003 United States national comorbidity surveys. J. Nerv. Ment. Dis. 196, 806–813.
Posner, K., Brown, G.K., Stanley, B., Brent, D.A., Yershova, K.V., Oquendo, M.A.,

Currier, V., Melvin, G.A., Greenhill, L., Shen, S., Mann, J.J., 2011. The Columbia–Suicide Severity Rating Scale: initial validity and internal consistency findings from three multisite studies with adolescents and adults. Am. J. Psychiatry 168, 1266–1277.

Steer, R.A., Beck, A.T., Garrison, B., Lester, D., 1988. Eventual suicide in interrupted and uninterrupted attempters: a challenge to the cry-for-help hypothesis. Suicide Life Threat 18, 119.

Storch, E.A., Roberti, J.W., Roth, D.A., 2004. Factor structure, concurrent validity, and internal consistency of the beck depression inventory—second edition in a sample of college students. Depress. Anxiety 19, 187–189.

Suominen, K., Isometsä, E., Suokas, J., Haukka, J., Achte, K., Lönnqvist, J., 2004. Completed suicide after a suicide attempt: a 37-year follow-up study. Am. J. Psychiatry 161, 562–563.

Toprak, S., Cetin, I., Guven, T., Can, G., Demircan, C., 2011. Self-harm, suicidal ideation and suicide attempts among college students. Psychiatry Res. 1, 140–144.

Van Orden, K.A., Cukrowicz, K.C., Witte, T.K., Joiner Jr, T.E., 2012. Thwarted belongingness and perceived burdensomeness: construct validity and psychometric properties of the Interpersonal Needs Questionnaire. Psychol. Assess. 24, 197.

Van Orden, K.A., Witte, T.K., Gordon, K.H., Bender, T.W., Joiner, T.E., 2008. Suicidal desire and the capability for suicide: Tests of the interpersonal-psychological theory of suicidal behavior among adults. J. Consult. Clin. Psychol. 76, 72–83.

Whitlock, J., Muehlenkamp, J., Eckenrode, J., Purington, A., Abrams, G.B., Barreira, P., Kress, V., 2013. Nonsuicidal self-injury as a gateway to suicide in young adults. J. Adolesc. Health. 52, 486–492.