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Life events and suicidal ideation and behavior: A systematic review

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HIGHLIGHTS

- Provides a systematic review of life events and suicidal ideation and behavior
- The relation with stressors was stronger for severe forms of ideation and behavior.
- The relation with positive events was weak for suicidal ideation and behavior.
- Several important methodological limitations characterize much of the literature.

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ABSTRACT

Despite the sustained theoretical and empirical interest over the past 40 years in the association between life events and suicidal ideation and behavior, the literature in this area has yet to be systematically reviewed. The current article provides a comprehensive review of the empirical literature pertaining to life events in relation to at least one aspect of suicidal ideation and behavior (i.e., suicidal ideation, plans, attempts, degree of suicidal intent, medical severity of attempt, repeat versus first lifetime attempt status, and death by suicide). A total of 95 articles meeting inclusion criteria were identified by a literature search using Medline and PsycINFO. Evidence for an association between negative life events and suicidal ideation and behavior was generally consistent, with strongest support found for more severe than with less severe forms of suicidal ideation and behavior. Support for an inverse relation between positive events and suicidal ideation and behavior was generally lacking. Although there is general support for life stressors as a risk factor for suicidal ideation and behavior, interpretation of these findings is constrained by methodological limitations prevalent in much of the literature, particularly in the case of suicidal ideation and suicide plans. Recommendations for future research are provided.

Contents

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1 . Introduction

Although there has been substantial progress in the development of efficacious treatments for a variety of mental health concerns, such has not been the case for suicidal behavior. Indeed, while intervention efforts for suicidal behavior have increased considerably in recent decades, no corresponding decrease has been observed in the prevalence of these phenomena (Kessler, Berglund, Borges, Nock, & Wang, 2005; Nock et al., 2008). Thus, suicide remains a significant public health concern and a leading cause of death worldwide (Nock et al., 2008).

Arriving at a better understanding of the factors underlying risk for suicidal behavior is crucial to improving risk assessment and intervention strategies for addressing this behavior. Although suicidal behavior is multi-determined, reflecting a convergence of multiple intrapersonal and environmental influences, one risk factor that has received substantial empirical consideration over the past four decades is negative life events. Moreover, life stressors feature prominently in several etiological theories of suicide (e.g., Hawton, Saunders, & O'Connor, 2012; Joiner, 2005; Mann, Waternaux, Haas, & Malone, 1999, Mann et al., 2005; O'Connor, Rasmussen, & Hawton, 2012; Wenzel & Beck, 2008). Despite the considerable theoretical and empirical interest in this area, past reviews of suicide research have generally touched upon negative life events relatively briefly in the course of a more general coverage of the suicide literature (Beautrais, 2000; Brent, 1995; Bridge, Goldstein, & Brent, 2006; Gould, 2003; Spirito & Esposito-Smythers, 2006), or have focused exclusively on particular forms of life stressors (e.g., childhood abuse in Santa Mina & Gallop, 1998; sexual assault in women in Ullman, 2004; and childhood abuse and combat-related trauma in Adams & Lehnert, 1997) or a particular form of suicidal behavior (e.g., death by suicide in psychological autopsy studies in Foster, 2011), or reviewed evidence relating to a specific model of suicide (e.g., cognitive functioning mediating the relation between early life stressors and suicidal behavior in Yang & Clum, 1996). Thus, although these earlier reviews report general support for the etiological relevance of negative life events in suicidal ideation and behavior, there have been no comprehensive and systematic reviews to date on the relation between life stressors and different aspects of suicidal ideation and behavior.

The current effort sought to address this gap by systematically reviewing the extant literature relating life events to at least one aspect of suicidal ideation and behavior (i.e., suicidal ideation, plans, attempts, degree of suicidal intent, medical severity of attempt, repeat versus first lifetime attempt status, and death by suicide). Although negative life events were the primary focus of the current review, positive life events were considered in studies that also examined them in relation to some aspect of suicidal ideation and behavior. Additionally, although the associations between suicide and subjective as well as physiological stress are undoubtedly important ones, the current effort focused specifically on the literature examining how objectively occurring life events (i.e., events in the individual's environmental, independent of subjective appraisals; Grant et al., 2003) relate to suicidal ideation and behavior. To provide context for understanding and evaluating the literature on life events in relation to suicidal ideation and behavior, the current review first begins with a brief background on the study and conceptualization of life events.

1.1 . Developments in the conceptualization and measurement of life events

A quite substantial body of research on the potential role of life events in the risk for suicidal ideation and behavior has accumulated since the first publications in this area in the early 1970s. Since that time, there have been several significant developments in how life stressors have been studied and conceptualized. An important early influence in life events research was Holmes and Rahe's (1967) Social Readjustment Rating Scale (SRRS), which defined stressful life events as occurrences most likely to result in readjustment-requiring changes in people's daily activities. Accordingly, Life Change Unit (LCU) weights were assigned to each SRRS item, and a summary of LCUs for endorsed events served as an indicator of overall life stress. Despite its initial popularity, the SRRS fell out of favor among life events researchers with the eventual recognition of several conceptual and methodological issues. In particular, the SRRS (and several subsequently developed life event inventories) included items that were disorders or symptoms of psychopathology. In terms of evaluating life stressors as a risk factor for suicidal ideation and behavior, this issue introduces not inconsiderable difficulties for discerning the unique effect of life stressors independent of psychopathology commonly associated with suicidal ideation and behavior. Additionally, the notion that LCUs underlie the pathogenic effect of life events has now become dated, as LCUs tend to underestimate the relation between life stressors and psychopathology (Goodyer, 1990; Johnson & Roberts, 1995; Kessler, 1997). In its place, other aspects of life events (e.g., unexpectedness) are now viewed as more relevant to mental health outcomes (Hammen, 2005; Kessler, 1997).

Also a noted weakness of life event checklists is their inherent insensitivity to individual circumstances surrounding events which may affect their severity. That is, the same event is accorded equal weight across all individuals, regardless of the context in which it occurs. This is problematic, for example, in the case of a child moving out of the home, which takes on very different meanings if it was to attend college or involved child protective services. One attempt to resolve this issue involved having respondents rate the subjective stressfulness of each endorsed event on a Likert scale. This approach, however, introduces problems of its own. Given that the individual's current affective state (Monroe & Reid, 2008) and diathesis (Dohrenwend, 2006; Espejo et al., 2011) may influence these subjective ratings, their use makes it impossible to determine whether an observed relation with mental health outcomes is due to an environmental stressor or an individual's psychopathology or diathesis. For this reason, life events researchers have cautioned against this approach (Dohrenwend, 2006; Hammen, 2005; Kessler, 1997). The inclusion of subjective stress ratings, however, continues to be fairly common in the literature.

An alternative strategy is the "contextual threat" approach pioneered by Brown and Harris (1978) with their Life Events and Difficulties Schedule. This interview-based approach involves eliciting from the individual a narrative of the context in which each event occurred and its consequences (Brown & Harris, 1978). This approach yields detailed information surrounding each event, allowing for a much more sensitive evaluation of the event's impact on the individual. For example, the death of a child's sole parental caretaker by suicide likely has considerably more impact than the death of an adult's parent to natural causes. This information is then presented to a panel of independent raters blind to the individual's psychopathology, risk factors, and subjective response, and it is tasked with assigning an "objective threat" rating for each event (i.e., the stressful of the event to the average person in identical circumstances). Such information is also important for certain categorizations of events. For instance, determining whether a child changing schools is behavior-dependent (e.g., a result of expulsion from a prior school) or independent (e.g., a result of the child's parents finding a job in a different city) is impossible with checklists, but achievable with contextual threat approaches. For these reasons, the contextual threat approach is now regarded as the gold standard in the field (Dohrenwend, 2006; Hammen, 2005; Monroe, 2008). Nonetheless,

self-report checklists still predominate the literature, in large part because interview-based methods are much more labor intensive.

In summary, there has been substantial heterogeneity and changes in how life events have been conceptualized and studied over the last four decades. The manner in which any given study operationalized life events has direct bearing on the interpretation of its findings. For this reason, we excluded from the current review studies with subjective stress ratings in their life events measure, given the aforementioned methodological confounds with pre-existing diatheses and psychopathology. Additionally, we will place particular focus on the methodology used to assess life events in individual studies and related implications for interpreting their findings.

2 . Method

To identify studies potentially relevant to the current review, a literature search was conducted in Medline and PsycINFO using the following title and abstract search string: (suicid* OR parasuicid* OR self-harm) AND (life stress* OR stressor* OR event*). The following specifications were also applied to our query: (i) English-language publication, (ii) human sample, and (iii) published in a peer-reviewed journal. Only articles published up to the end of December 2010 were included in the present review. This search strategy yielded 1990 articles, the titles and abstracts of which were then individually examined for potential relevance.

The following inclusion criteria were applied to these articles to determine their eligibility for the current review: (i) inclusion of analyses directly examining the relation between life events and an aspect of suicidal ideation and behavior; (ii) quantitative study; (iii) time frame covered in the assessment of life events was specified and consistent across study participants; (iv) measurement of life events was standardized across participants (e.g., studies that collected data on life events from medical chart reviews or suicide notes were excluded); (v) measurement of multiple forms of life events (i.e., studies were not included if they examined a single life event, such as failure on an exam, in relation to suicidal ideation and behavior); (vi) in studies examining childhood life events, childhood maltreatment was not the primary form of life event examined[1]; (vii) inclusion of analyses of objective occurrence of life events (i.e., not subjective or physiological stress) for reasons mentioned above; and (viii) assessed suicidal behavior separately from non-suicidal self-injury (NSSI).[2] Studies that featured life stressors only as a covariate in their analyses were nevertheless included in the current review if results relating to their association with an aspect of suicidal ideation and behavior were reported.

Based on these inclusion criteria and an initial examination of the titles and abstracts of the 1990 articles identified in our literature search, 1691 were excluded. After this initial screen, a more thorough examination was conducted of the contents of the remaining 299 articles. This examination yielded a final set of 95 eligible articles (see Fig. 1). Excluded studies did not assess the relation between life stressors and an aspect of suicidal ideation and behavior ($n = 50$); did not distinguish suicide attempts from other forms of psychopathology ($n = 1$); were qualitative ($n = 6$); had insufficient or no information on how life stressors were assessed ($n = 15$); were inconsistent across participants or provided no information on the timeframe covered in the assessment of life stressors ($n = 24$); employed a non-standardized system for collecting data on life stressors ($n = 11$); assessed only one specific type of stressor ($n = 3$); reported results only for childhood sexual abuse ($n = 1$); only assessed subjective or physiological stress ($n = 71$); and did not assess suicidal behavior separately from NSSI ($n = 22$).[3] In reviewing the eligible studies, the current paper will first focus on those assessing life stressors, proceeding from mild to greater severity of suicidal ideation and behavior, and end with studies of positive life events.

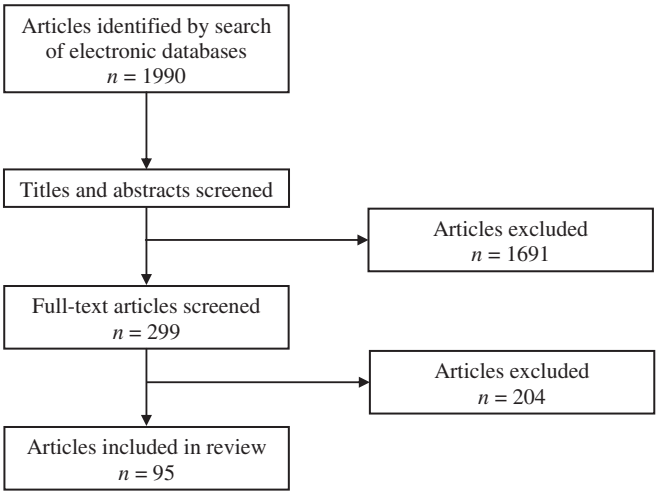

Fig. 1. Flow diagram of identified studies.

3 . Results

3.1 . Suicidality

Ten studies assessed the relation between life stressors and suicidality as a general construct (i.e., collapsing across multiple manifestations of suicidal ideation and behavior). All studies provided some degree of support for a positive association between life stressors and suicidality, although there were some differences in the exact nature of this relation. Eight studies reported a main effect for life stressors (Blaauw, Arensman, Kraaij, Winkel, & Bout, 2002; Brent, Kolko, Allan, & Brown, 1990; Cheng & Chan, 2007; Harder, Strauss, Kokes, Ritzler, & Gift, 1980; Özer, Uluşahin, Batur, Kabakçi, & Can Saka, 2002; Paykel, Myers, Lindenthal, & Tanner, 1974; Statham et al., 1998; Steinhausen, Bösiger, & Metzke, 2006), whereas two reported moderation effects with the absence of main effects (Caspi et al., 2003; Chang, Sanna, Hirsch, & Jeglic, 2010). Interpretability of the findings in several of these studies is constrained, however, by the timeframe used for assessing the occurrence of life stressors. Specifically, five studies used identical or significantly overlapping time windows for their assessment of life stressors and suicidality (Caspi et al., 2003; Chang et al., 2010; Cheng & Chan, 2007; Paykel et al., 1974; Steinhausen et al., 2006), which pose significant challenges for determining the temporal direction of their relation. A sixth study measured life stressors over the lifetime in an adult community sample (Statham et al., 1998), which raises concerns on two counts. First, recollection for many major life events tend to start fading after about a year (Johnson, 2005; Paykel, 1997), and more mild ones after even briefer intervals (Brown & Harris, 1982). Second, some suicide researchers have

[1] For studies that include childhood maltreatment along with other forms of early life stressors, only results involving these other life stressors were included in the current review.

[2] Although NSSI is an important clinical concern in its own right, it has often been studied in combination with suicidal behavior under the broader constructs of parasuicide and deliberate self-harm. There is evidence that differentiating between NSSI and suicidal behavior is important insofar as they are distinct constructs differentially related to potential risk factors (Hamza et al., 2012; Lawlor et al., 2000; Nock & Kessler, 2006). "Parasuicid*" and "self-harm" were nonetheless included among our search terms in the interest of casting as comprehensive a search as reasonably possible and to account for the possibility that some studies may have applied these broader terms to suicide attempts or included an assessment of other aspects of suicidality (e.g., SI). Individual inspection of studies on parasuicide and deliberate self-harm resulted in the identification of three studies that met the inclusion criteria and thus were incorporated in the present review.

[3] Three additional studies combined suicidal behavior and NSSI, but were retained in the current review for their assessment of life stressors in relation to suicidal ideation and death by suicide.

theorized that life stressors may often function as triggers for suicidal ideation and behavior, particularly when interacting with an underlying diathesis (Mann et al., 1999; O'Connor et al., 2012), and thus should be expected immediately to precede the outcome they are hypothesized to predict. Insofar as proximal stressors are indeed of greater etiological relevance than more distal ones, the strength of their relation with suicidality is likely attenuated or entirely obscured when included with other life stressors assessed over a very broad time interval.

Of the four remaining studies, three measured life stressors over intervals of 12 months or fewer (Brent et al., 1990; Harder et al., 1980; Özer et al., 2002). All three were consistent in finding an association between life stressors and suicidality in clinical samples. Although one of these featured an interview-based measure of life events (Harder et al., 1980), which included attempts to date the occurrences of individual events, an adaptation of the SRRS was used, with LCU weights incorporated in the summary life events scores. Despite its limitations, this study is unique in providing a fine-grained temporal analysis of the role of life stressors in suicidality. Consistent with the aforementioned theories of suicidality, recent stressors (i.e., those occurring within the past 12 weeks), but not more distal ones (i.e., those up to 12 months in the past), were found to be particularly relevant to risk for suicidality.

Although these studies provide general support for the role of life stressors in the pathogenesis of suicidal ideation and behavior, interpretative constraints, apart from the ones just mentioned, should be noted. Specifically, interpretation of these findings is limited by the fact that different manifestations of suicidal ideation and behavior may be strongly interrelated but relatively distinct phenomena (DeJong, Overholser, & Stockmeier, 2010). That is, although suicidal ideation (SI) is itself a not insignificant clinical concern, a small proportion of ideators transition to making a suicide attempt (Nock et al., 2008). Similarly, a relatively small proportion of suicide attempters eventually die by suicide (Kuo & Gallo, 2005; Nock et al., 2008). Thus, examining these different manifestations of suicidal ideation and behavior separately is important for clarifying their specific relation to life stressors.

3.2 . Suicidal ideation

Of the studies identified in this review, 38 specifically examined the relation between life stressors and SI in adolescents ($n = 20$) and primarily adults ($n = 17$), the vast majority using community ($n = 29$) rather than clinical ($n = 8$) samples. Twenty-seven reported evidence of a positive association between SI and stressors (Casey et al., 2006; Chang, 2002; Cole, Protinsky, & Cross, 1992; Dupéré, Leventhal, & Lacourse, 2009; Garrison, Addy, Jackson, & McKeown, 1991; Goldney, Wilson, Dal Grande, Fisher, & McFarlane, 2000; Haavisto et al., 2005; King et al., 2001; Lam, Bond, Chen, & Wu, 2010; Mazza & Reynolds, 1998; Monroe, Harkness, Simons, & Thase, 2001; Turvey, Stromquist, Kelly, Zwerling, & Merchant, 2002; van Leeuwen, Rodgers, Régner, & Chabrol, 2010; Vilhjalmsson, Krisjansdottir, & Sveinbjarnardottir, 1998; Waelde, Silvern, & Hodges, 1994; Wan & Leung, 2010; Yoder, Whitbeck, Hoyt, & LaFromboise, 2006), particularly interpersonal ones (Adams, Overholser, & Spirito, 1994; Belik, Cox, Stein, Asmundson, & Sareen, 2007; Borges et al., 2008; Fanous, Prescott, & Kendler, 2004; Fergusson, Woodward, & Horwood, 2000; Joiner & Rudd, 1995; Stein et al., 2010; Thompson et al., 2006; Wahlström, Michélsen, Schulman, & Backheden, 2010), with one study finding the relation between stressors and SI to be specific to boys (Rohde, Seeley, & Mace, 1997). Although one study failed to find a direct effect, life stressors were found to interact with internalizing disorders to predict SI (Esposito & Clum, 2003). Yet another study was unique in finding life stressors to be involved in contagion of SI in college roommates, with shared relationship stress accentuating the similarity in roommates' level of SI (Joiner, 2003). In contrast to these findings, nine studies failed to observe an association (Dean & Range, 1999; McKeown et al., 1998; Reinecke & DuBois, 2001), with some finding this to be the case after accounting for covariates (Dubow, Kausch, Blum, & Reed, 1989; Garrison, Jackson, Addy, McKeown, & Waller, 1991; Grover et al., 2009; Hintikka et al., 2009; Liu & Tein, 2005; Ullman & Brecklin, 2002).

In an attempt to resolve these mixed findings, and for reasons mentioned previously, we considered focusing on studies that did not utilize overlapping measurement intervals for life stressors and SI, and assessed life stressors over intervals of 12 months or fewer. All 21 studies meeting these criteria, however, had notable methodological limitations that pose interpretative challenges of their own. Specifically, only one of these studies featured a contextual threat interview (Monroe et al., 2001), an important point given the weaker effect sizes that tend to be observed with self-report checklists (Gorman, 1993; Uher & McGuffin, 2010). Yet, this study, along with five others out of the 21 (Casey et al., 2006; Hintikka et al., 2009; Joiner, 2003; Vilhjalmsson et al., 1998; Waelde et al., 1994), utilized a single-item self-report measure of SI derived from a larger scale, the SI item from the Beck Depression Inventory (Beck & Steer, 1987) in most cases. Such single-item measures are characterized by reduced range and likelihood accurately and adequately to assess a construct which they were not intended primarily to measure. Additionally, five studies utilized too brief a life events assessment window (i.e., four to ten weeks) to capture meaningfully variability in the occurrence of major life stressors (Chang, 2002; Joiner, 2003; Joiner & Rudd, 1995; Lam et al., 2010; Thompson et al., 2006). Finally, one study (Grover et al., 2009) that failed to find an association between life stressors and SI, after accounting for covariates, evaluated this relationship in a relatively small sample of inpatients with current SI or recent suicide attempt. As it stands to reason that most, if not all, inpatients had clinically elevated levels of SI, this sample offered a limited assessment of the relation between life stressors and SI. Given the heterogeneity and prevalence of methodological limitations across these studies, it becomes quite difficult to reach firm conclusions regarding this relation, and consequently the finding in most studies of a positive association should be viewed as preliminary. Future research featuring life stress interviews administered over multiple relatively brief intervals, followed by an established measure of SI, are therefore necessary to move toward resolving the inconsistent findings in the current literature.

3.3 . Suicide plans

Only three studies identified in the current review examined negative life events in relation to suicide plans. Of these, two reported a positive association in adolescent samples (Borges et al., 2008; McKeown et al., 1998). However, evidence of traumatic events increasing risk of transition from SI to suicide plans appears minimal in two large-scale studies with adolescents (Borges et al., 2008) and adults (Stein et al., 2010). Although these two studies featured interview-based measures of traumatic stressors, neither assessed more commonly occurring non-traumatic life events, and therefore it cannot be assumed from these studies alone that life stressors in general are unrelated to risk for suicide plans among ideators. Additional research is required before conclusions can be formed regarding the etiological relevance of life stressors to suicide plans.

3.4 . Suicide attempts

Thirty-two studies assessed life stressors in association with suicide attempters. Starting first with studies assessing suicide attempters relative to non-psychiatric controls or mixed comparison group ($n = 26$), we found 23 studies with suicide attempts positive related to negative life events (Adams et al., 1994; Borges et al., 2008; Dubow et al., 1989; Dupéré et al., 2009; Garrison, Jackson, et al., 1991; Kaslow et al., 2002, 2005; King, Raskin, Gdowski, & Butkus, 1990; King et al., 2001; Nrugham, Holen, & Sund, 2010; Orbach, Stein, Palgi, & Asherov, 1996; Statham et al., 1998; Stein et al., 2010; Ullman & Brecklin, 2002; Vázquez, Panadero, & Rincón, 2010; Wan & Leung, 2010; Wilson,

Stelzer, Bergman, & Kral, 1995; Wong, Stewart, Ho, Rao, & Lam, 2005), particularly interpersonal stressors (Baca-Garcia et al., 2007; Belik, Stein, Asmundson, & Sareen, 2009; Belik et al., 2007; De Vanna, Paterniti, Milievich, & Rigamonti, 1990; Fergusson et al., 2000). Conversely, three studies observed no association between stressors and suicide attempts (Kirmayer, Boothroyd, & Hodgins, 1998; McKeown et al., 1998), with one finding observed associations reaching non-significance after accounting for covariates (Wong et al., 2008).

One of these studies that failed to find an association (Kirmayer et al., 1998) was hindered by several significant methodological limitations, including the assessment of past-year life stressors in relation to lifetime history of attempted suicide, and the use of a 6-item life events instrument, which inadequately captured life events experienced by study participants. Another study was likely underpowered, with only six prospectively occurring suicide attempts in the sample (McKeown et al., 1998). In contrast, the third was in many ways among the more methodologically rigorous studies identified in the literature, featuring a longitudinal design, and including suicidal intent as part of its definition of suicide attempts (Wong et al., 2008). What may, in some measure, explain the null finding in this case, however, is the use of a 14-item self-report life events measure, which likely missed a significant number of stressors relevant to individuals in the study. When only studies adopting life stress interviews and non-overlapping assessment periods for life events and suicide attempts were considered, a positive association was consistently observed (Fergusson et al., 2000; Stein et al., 2010; Wilson et al., 1995), including the case of one study using a contextual threat approach (De Vanna et al., 1990). Collectively, these patterns of findings suggest that the life events measure employed may in large part account for observed differences across studies with non-psychiatric samples.

Given that life stressors have also been linked with other forms of psychopathology (e.g., depression in Hammen, 2005; and NSSI in Hankin & Abela, 2011), studies utilizing clinical samples may provide a more stringent test of the association between life stressors and suicidal behavior by assessing the degree to which any observed relation is not better accounted for by concurrent psychopathology. Among studies with clinical controls ($n = 6$), five reported evidence of an association between life stressors and suicide attempts (Arie, Apter, Orbach, Yefet, & Zalzman, 2008; Azorin et al., 2009; de Wilde, Kienhorst, Diekstra, & Wolters, 1992; Rohde et al., 1997; Yen et al., 2005). Only one study reported no relation between life events and suicide attempt status (Kelly, Soloff, Lynch, Haas, & Mann, 2000). However, this study, as well as two that found a positive association (de Wilde et al., 1992; Rohde et al., 1997), was affected by substantially overlapping assessment windows for stressors and suicide attempts. In contrast, the one multiwave study with a purely clinical sample and using an interview-based assessment of stressors and suicide attempts found evidence of a relation between the two constructs, particularly in the case of romantic and legal stressors (Yen et al., 2005).

3.5 . Aspects of suicide attempts: suicidal intent, medical lethality, and number of attempts

Apart from the occurrence of suicide attempts, are there certain aspects of suicidal behavior particularly associated with life stressors? Among the few studies to address this question, two found a positive association with suicidal intent (Kumar, Mohan, Ranjith, & Chandrasekaran, 2006; Power, Cooke, & Brooks, 1985), but another failed to observe this relation (Strosahl, Chiles, & Linehan, 1992). It is worth noting, however, that the latter study assessed the relation between suicidal intent and life stressors over the past 12 months, whereas the two studies with a positive association assessed stressors in the month and six months prior to the index attempt, perhaps suggesting that this relation is more relevant to recent than distal stressors. In terms of medical lethality, one study found no association with life stressors (Power et al., 1985). Despite this study's use of an established life stress interview (Paykel's Interview for Recent Life Events; Paykel, 1983), interpretation of its finding is constrained, however, by the inclusion of both early adolescents and adults, as adolescent attempters often have a poor estimation of the potential lethality of their attempts (Sapyta et al., 2012).

Finally, Schillani et al. (2009) reported a positive correlation between life stressors in the six months prior to the index attempt and the number of previous attempts in an adult inpatient sample. Given the cross-sectional nature of this study, it is impossible to determine what underlying factors may account for this relationship. One possibility, a variation of the stress autonomy hypothesis, is that after each suicide attempt experienced by the individual, life stressors exert less of an influence in triggering subsequent suicidal behavior, and thus a greater rate of stressors is required to achieve the same pathogenic effect. Another possibility is that repeat attempters may experience greater rates of dependent stressors[4] that are influenced by their greater psychopathology and behavioral risk factors (i.e., the stress generation hypothesis). Future longitudinal studies utilizing a contextual threat life stress interview are required adequately to evaluate these hypotheses.

3.6 . Death by suicide

Twenty studies have examined life stressors in relation to death by suicide. Most utilized live community controls ($n = 17$), although live clinical patients ($n = 1$) and decedents of accidental deaths ($n = 2$) have also been used. The majority of studies found evidence of a link between death by suicide and life stressors (Altindag, Ozkan, & Oto, 2005; Cheng, Chen, Chen, & Jenkins, 2000; Khan, Mahmud, Karim, Zaman, & Prince, 2008; Li, Phillips, Zhang, Xu, & Yang, 2008; Palacio et al., 2007; Tsoh et al., 2005; Vijayakumar & Rajkumar, 1999; Zhang, Conwell, Zhou, & Jiang, 2004; Zhang, Xiao, & Zhou, 2010; Zhang & Zhou, 2009), particularly interpersonal stressors (Appleby, Cooper, Amos, & Faragher, 1999; Brent, Perper, Moritz, & Baugher, 1993; Brent, Perper, Moritz, & Liotus, 1994; Cavanagh, Owens, & Johnstone, 1999; Duberstein, Conwell, Conner, Eberly, & Caine, 2004; Foster, Gillespie, McClelland, & Patterson, 1999; Rubenowitz, Waern, Wilhelmson, & Allebeck, 2001; Waern, Rubenowitz, & Wilhelmson, 2003), with a few also finding a relation to legal stressors (Appleby et al., 1999; Brent et al., 1993) and somatic illness in adults (Cavanagh et al., 1999; Duberstein et al., 2004; Khan et al., 2008). In one study, negative life events interacted with depression and anxiety symptoms (Pokorny & Kaplan, 1976). Contrasting with these findings, one study found traumatic life events to be unrelated to suicide (Taylor, Page, Morrell, Harrison, & Carter, 2005). That this study failed to find an association warrants attention, especially given that it was a population prevalence study, and thus, by a considerable margin, the largest study to evaluate life stressors as a risk factor for suicide. One possibility for the null finding is that it only assessed traumatic life events over the lifetime in an adult sample, whereas all other studies on death by suicide employed more comprehensive measures of life stressors that occurred within the last twelve months or fewer. It may be that traumatic life events are less relevant to risk for death by suicide. Alternatively, the inclusion of early traumatic events may have obscured the relation between more recent ones and suicide.

3.7 . Suicidal ideation versus attempts

In addition to comparisons with clinical controls, assessments between different forms of suicidal ideation and behavior may prove particularly informative; attempters represent a relative minority of individuals with SI (Nock et al., 2008), and so may be a relatively distinct

[4] Dependent stressors are defined as negative life events that are at least in part influenced by the individual's behaviors and characteristics (e.g., getting into a fight), whereas independent stressors are negative life events that occur independent of the individual's behaviors and characteristics (e.g., a family member needing surgery).

subgroup. Determining risk factors that differentiate suicide attempters from ideators may therefore be of potential clinical utility. Relative to ideators, attempters have been found to experience more stressors (King et al., 2001), particularly health-related and interpersonal ones (Fairweather, Anstey, Rodgers, & Butterworth, 2006). One study found traumatic events to predict the transition from SI to suicide attempts in adolescents (Borges et al., 2008), whereas another found weak support for this association in adults (Stein et al., 2010). Both of these latter large-scale studies adopted identical measures of traumatic events and suicidal ideation and behavior. Thus, until further evaluated in future studies, these findings suggest that suicidal adolescents may be more vulnerable to the effect of traumatic stressors than are adult counterparts.

3.8 . Suicide attempts versus death by suicide

Insofar as attempters may form a relatively distinct subset of ideators, suicide decedents may be similarly distinct from attempters (DeJong et al., 2010). The few studies in this area have yielded decidedly mixed results. In one study with adults, suicide decedents were found to have experienced more work-related and financial, but not interpersonal, stressors (DeJong et al., 2010). Conflicting with these findings, another study with an adult sample found no difference between attempters and suicide decedents in recent financial stressors (Innamorati et al., 2008). A third study with adult attempters and suicide decedents reported no differences in life stressors (Tejedor, Castillón, Pericay, & Puigdellivol, 1987). In the one study featuring an adolescent sample, suicide attempters were found to have experienced *more* parental conflict than did suicide decedents (Brent, Perper, Goldstein, & Kolko, 1988). To some degree, these inconsistencies may reflect the life stress methodology employed in each study. More specifically, whereas the previously discussed studies examining life stressors in association with death by suicide are notable in that many featured a well-established life events instrument (in most cases, Paykel's Interview for Recent Life Events; Paykel, 1983), all four studies comparing suicide attempters to suicide decedents appeared to have designed life events measures of their own with less certain psychometric properties. Thus, future research with established life events interviews is required to resolve these conflicting results.

3.9 . Positive life events and suicidal ideation and behavior

Four studies examining positive life events in relation to an aspect of suicidal ideation and behavior yielded consistent findings. One found no association between positive life events and SI (Dubow et al., 1989), two reported no difference between suicide attempters and clinical controls (Arie et al., 2008; Yen et al., 2005), and perhaps more telling, another two found no differences between attempters and healthy controls (Dubow et al., 1989; King et al., 1990).

4 . Discussion

Overall, the current review found evidence of a link between life stressors and suicidal ideation and behavior, with the strength of support for this relation appearing to increase with the severity of suicidal ideation and behavior under consideration. Specifically, support for an association with life stressors was most consistent for death by suicide, followed by suicide attempts, and finally SI. Perhaps not coincidentally, studies of suicide-related deaths were among the more methodologically rigorous, whereas studies of SI tended to be notably weaker in methodological design. Thus, although the majority of studies were largely supportive of a relation with life stressors, regardless of which specific aspect of suicidal ideation and behavior was examined, the findings from studies on SI must be regarded as tentative and await confirmation from future research.

Also particularly noteworthy is the broad generalizability of these associations between life stressors and varying forms of suicidal ideation and behavior across different age groups and a wide range of countries and ethnic/cultural contexts. That is, the relations between life stressors and suicidal ideation, attempts, and deaths by suicide, respectively, have received supportive evidence from multiple studies utilizing adolescent and adult samples. Additionally, evidence of a link between life stressors and some aspect of suicidal ideation and behavior was reported in studies utilizing samples from over 26 countries, including studies with samples as diverse as rural Chinese (Zhang et al., 2010), and second generation immigrants in France (van Leeuwen et al., 2010).

Despite the breadth of these findings, some aspects of the empirical literature remain relatively unexamined. In particular, although the extant findings on suicide plans suggest that they are positively associated with life stressors, these findings must be regarded as preliminary as there is a notable paucity of studies in this area, especially relative to work on other aspects of suicidal ideation and behavior. Similarly, given the few studies directly comparing different forms of suicidal ideation and behavior (i.e., SI versus suicide attempts, and attempts versus deaths by suicide), the mixed findings in this area must be viewed as tentative, and further research is warranted. Finally, among the four studies to assess positive life events in relation to some aspect of suicidal ideation and behavior, the majority failed to find evidence of an association, but likewise require future confirmation. Certain important aspects of positive life events remain unexplored. For example, just as negative dependent stressors have been found to be particularly relevant to other manifestations of psychopathology (e.g., depression; Hammen, Marks, Mayol and DeMayo, 1985; Hammen, 1991; Jacobs & Myers, 1976; Williamson, Birmaher, Anderson and Al-Shabbout, 1995), it may be that positive dependent, but not independent, life events are inversely associated with suicidal ideation and behavior.

Also generally underrepresented in the empirical literature are studies utilizing childhood (i.e., pre-adolescent) and elderly samples, despite the aforementioned abundance of studies with adolescents and adults. In the case of the pre-adolescent samples, the lack of research may be largely accounted for by the rarity of suicidal ideation and behavior in very young children. Indeed, some researchers have asserted that children under the age of 10 do not possess the cognitive capability fully to comprehend the nature of death, and consequently are incapable of truly engaging in suicidal behavior (Cuddy-Casey & Orvaschel, 1997; Nock et al., 2008). Instead, risk of first-onset suicidal behavior tends to emerge around age 12 and to increase sharply over the course of adolescence (Nock et al., 2008, 2013). The relative absence of research on life stressors and suicidal ideation and behavior with elderly samples, however, cannot be similarly explained. To date, no studies with elderly samples have assessed life stressors in relation to suicidal ideation, plans, or attempts. Although suicide ceases to be one of 10 leading causes of deaths among the elderly (i.e., ages 65 and above), in contrast to what has been consistently observed from ages 10 to 64 (Centers for Disease Control and Prevention, 2011), this is likely a reflection of an increase in age-related health complaints (e.g., heart disease and Alzheimer's disease) rather than a decline in absolute rates of suicide. In fact, male suicide rates are markedly higher among the elderly than other age groups, whereas female suicides tend not to vary much with age (Nock et al., 2008). Moreover, and in contrast to the lack of research on suicidal ideation and attempts in the elderly, 20% of the 20 reviewed studies focusing on death by suicide included elderly samples. Insofar as suicidal ideation and attempts are associated with eventual death by suicide (Nock et al., 2008), understanding the role of life stressors in suicidal ideation and attempts among the elderly may be especially important for decreasing the high rates of suicide observed in this age group.

Where considerable variability in the literature arises is in findings relating to specific subtypes of life stressors. Overall, relative to other forms of stressors (e.g., somatic and financial stressors), interpersonal ones were most consistently associated with suicidal ideation, attempts, and death by suicide. Despite this trend, substantial inconsistency was

observed across studies in the specific nature of interpersonal stressors found to be relevant to the aspect of suicidal ideation and behavior examined (e.g., conflict with family members, conflicts with friends, divorce). There may be several possible explanations for the want of consistent findings across studies with these more fine-grained analyses. First, when general categories of life stressors are divided into more specific subcomponents (e.g., interpersonal conflicts subdivided into conflict with parents and conflicts with peers), the frequency of stressors within each new subcategory is inevitably reduced. Analyses with this greater category specificity may become a challenge for events with relatively low base rates (e.g., death of a spouse or jail sentence), especially in studies with relatively small sample sizes, and assessing life events over a circumscribed interval (e.g., past three months rather than lifetime). Thus, in some cases, the absence of a significant association between a particular stressor subtype and an aspect of suicidal ideation and behavior may be the result of insufficient statistical power to detect an effect, rather than that it has no etiological bearing on suicidal ideation and behavior. Given that interpersonal stressors as a group are by nature considerably more frequent than many other categories of stressors (e.g., job loss and legal stressors), it is unclear if this may in some measure explain why findings relating to the former have been more consistent in the literature, or if interpersonal stressors are inherently more pathogenic. Another possibility relates to the fact that as the resolution in stressor category specification increases, accuracy in classifying reported stressors likewise becomes more challenging. Although interview-based measures of life stressors are relatively immune to this issue, it is often a concern with self-report checklists, as respondents idiosyncratic criteria for each item or stressor category may differ from that of the researchers (for a more detailed discussion of challenges in categorizing life events, see Dohrenwend, 2006). This matters more when individual items are assessed than when they are collapsed within broader categories. For instance, whether an event is accurately categorizing as a major argument with a significant other or as the dissolution of the relationship is of obvious importance for analyses where each event-type is examined separately, but becomes irrelevant for analyses involving interpersonal stressors as a broader category. In short, with increased specificity in stressor category, there is greater potential for error variance to occur. A third possibility is that developmental differences may exist in the impact of specific life stressors. For example, physical injuries as a category may be generally more severe and thus of greater consequence to elderly respondents than adolescent ones.

Also worth mentioning are several methodological concerns characterizing much of the extant literature. First, studies varied significantly in the quality of the instrument employed to assess life events. The most commonly used of these are self-report measures, featured in 62.1% of the 95 studies in the current review.[5] Even among interviews, notable variability in quality exists; in actuality, the true number of studies with self-report measures is somewhat higher, as it was not always possible for us to ascertain if the life events interviews utilized in certain studies consisted entirely of verbal administration of a life events checklist. Although several studies utilizing interviews involved the generation of event narratives, only three studies in the current review featured contextual threat assessments of life events. Despite the clear economical advantages of life events inventories relative to more intensive interview-based methodologies, several psychometric limitations inherent in their use pose challenges for interpreting study findings (for more detailed discussions of these issues, see Dohrenwend, 2006; Hammen, 2005; Monroe, 2008). As touched upon above, self-report checklists are vulnerable to idiosyncratic reporting biases, particularly mood-congruent reporting biases, against which interview-based approaches are more immune, rating events based on concrete indicators of their occurrence (Brown & Harris, 1978). Thus, self-report checklists may in some measure reflect pre-existing diatheses in addition to the objectively occurring events they are intended to measure. An added benefit of interview-based approaches is that they allow for greater resolution in the dating of event onset and offset, an important consideration in assessing the temporal relation between stressors and suicidal ideation and behavior.

Another relevant methodological issue is the wide range across studies in what was considered a stressor. The list of events featured in some studies have included psychopathology (e.g., depression), smoking, alcohol use, and vague items especially prone to subjective interpretation biases which in and of themselves would not qualify as a life event (e.g., "being frightened" or "nothing to do"). As mentioned above, the inclusion of psychopathology represents a confound and is especially problematic to the degree that (i) stressors have been found to precipitate psychopathology (e.g., depression; Hammen, 2005), and (ii) these forms of psychopathology themselves are predictive of suicidal behavior (Mann et al., 2005). Avoiding overly broad definitions of life events is essential for cleanly assessing their relation with suicidal ideation and behavior.

A third limitation that warrants attention is the utilization of lengthy recall periods for life events prevalent in much of the literature, an issue we have discussed earlier. Of the studies included in the present review, 20% included life events assessments with recall periods exceeding 12 months prior to the time of assessment. This issue is magnified in psychological autopsy studies, in which (i) assessments of life events relevant to the decedent are dependent on second-hand reporting, and (ii) sizeable temporal lags between the decedent's suicide and assessment of life events are not uncommon. Thus, where reasonably possible, briefer and more frequent recall periods are essential for accurately documenting the association between stressors and suicidal ideation and behavior.

In addition to assessments of stressors, particular consideration should be given to the measurement of suicidal ideation and behavior. Just as significant variability is evident across studies in the measurement of life events, so too is this case for the assessment of suicidal ideation and behavior. This issue is of particular relevance to the assessment of suicide attempts. A suicide attempt is defined as self-harm conducted with non-zero intent to die, in contrast to NSSI, which is characterized as deliberate self-harm with the absence of any suicidal intent (Asarnow et al., 2011). Nonetheless, 48.8% of the 43 reviewed studies including an assessment of suicide attempts that did explicitly include suicidal intent as one of its definitional criteria, and 20.1% did not include any detail on how suicide attempts were operationalized. Past research has demonstrated that even asking a question with seeming face validity regarding suicidal behavior (e.g., whether the respondent has ever attempted suicide) without explicitly querying about suicidal intent yields a false positive rate of approximately 41.8% (Nock & Kessler, 2006). As previously mentioned, not to differentiate clearly between suicidal behavior and NSSI is an important concern to the extent that the two are related but distinct clinical phenomena (Hamza, Stewart, & Willoughby, 2012; Lawlor, Corcoran, & Chambers, 2000; Nock & Kessler, 2006). Again, the use of established structured interviews (e.g., the Self-Injurious Thoughts and Behaviors Interview; Nock, Holmberg, Photos and Michel, 2007; and the Columbia-Suicide Severity Rating Scale; Posner et al., 2011) confers advantages over self-report measures in ensuring reports of suicidal behavior are systematically consistent with research definitions.

Another methodological limitation characterizing much of the literature is the substantial temporal overlap in the periods covered by measurements of life events and suicidal ideation and behavior. Indeed, 30.5% of the 95 studies included in the current review had partial or complete overlap in the assessments of these constructs. This figure increases to 40.8% after excluding psychological autopsy studies, for which life events occurring subsequent to suicide are not possible. Consequently, the degree to which assessed stressors temporally precede

[5] In the case of four studies, verbally administered checklists (often to address concerns regarding respondent literacy level), without any interviewer probing or event-criteria decision-making, were categorized as self-report.

and precipitate suicidal ideation and behavior in these studies is often unclear. In cross-sectional studies with a relatively short recall interval, it is possible to date the occurrence of life events and suicide attempts utilizing interview-based measures, and thereby ensure that only events temporally preceding the index suicide attempt are included in analyses. Nonetheless, prospective studies featuring multiple assessment points are essential for accurately documenting the relation between life stressors and suicidal ideation and behavior, because with cross-sectional research, it is impossible to account for the effects of other risk factors temporally *preceding* the suicide event. For example, given that past SI and depression symptoms are predictive of future suicidal ideation and behavior (Mann et al., 2005; Spirito & Esposito-Smythers, 2006), it is important to include a baseline assessment of these risk factors for future suicidal ideation and behavior, so as to allow for a determination of the unique effects of temporally intervening life stressors. Although several cross-sectional studies in the present review acknowledged the importance influence of other psychopathology by covarying these phenomena assessed concurrently with suicide-related outcomes, this strategy may artificially diminish the strength of the association between life stressors and the suicide-relevant outcomes because it conflates concomitants with temporally preceding risk factors. It stands to reason, for example, that suicidal ideation and behavior are likely more strongly associated with concurrent depression than with prior depression. Consistent with this concern, in several studies, the initially observed relation between life stressors and the suicide event is reduced to non-significance after covarying other variables associated with suicidal ideation and behavior in this manner. At present, studies employing a prospective design are exceedingly rare, accounting for only 9.5%[6] of the extant literature.

4.1 . Limitations

Limitations of the current review also warrant discussion. First, although we attempted to provide as comprehensive a review of the literature as possible, a substantial number of studies were screened out based on our inclusion/exclusion criteria. Most of these studies ($n = 70$) were excluded for incorporating subjective ratings of stress severity in their assessment of life events. Interpretation of findings in these studies is potentially problematic in that these subjective stress severity ratings are likely influenced by both the objective severity of the event (e.g., having pneumonia is generally a more severe stressor than having a cold) and the individual's underlying diatheses (e.g., neuroticism; Espejo et al., 2011). Consequently, and to the degree that these diatheses confer risk for suicidal ideation and behavior, we believe the exclusion of these studies from the current review minimized rather than introduced potential bias in assessing the potential suicidogenic effects of life stressors.

Additionally, a narrative rather than meta-analytic review was conducted. Meta-analytic reviews have several clear advantages over narrative ones. Perhaps the chief advantage of meta-analysis is that this approach provides a general estimate of the effect size of the predictor or treatment in question based on the extant studies in the relevant literature. That is, while a narrative review is able to address the question of whether a relation between two variables exists, a meta-analysis is able not only able to ascertain the possible existence but also the magnitude of this relation. Related advantages of meta-analysis is its weighting of effect size estimates based on the sample size of individual studies, and its accounting for potential Type II errors in inadequately powered studies. It is also worth noting too that the current review was based entirely on published studies. Inasmuch as a publication bias exists toward the reporting of significant effects, the findings in this review may reflect a similar bias. A necessary limitation of narrative reviews relative to meta-analytic ones is that it is not possible to assess for the presence of publication bias (i.e., through the use of funnel plots), and thus a degree of caution should be taken in interpreting the current findings.

There are nonetheless circumstances, such as in the present case, where meta-analysis may be less suitable and compelling reasons exist for conducting a narrative review. In particular, meta-analysis requires substantial homogeneity in the assessed variables. Given the marked heterogeneity in the content and nature of life events instruments featured in the studies reviewed, meta-analysis was not a suitable methodological approach (Bangert-Drowns, 1995; Dohrenwend, 2006; Uher & McGuffin, 2010). It is not uncommon for investigators to increase the suitability of a life stress measure by adapting it to unique characteristics of the population of interest. For example, the stressors most relevant to prison inmates are likely very different from those relevant to individuals residing in rural India. Developmental considerations may also influence decisions about what life stressors are assessed in a given study (e.g., it may be less meaningful to ask 10-year-olds about romantic stressors, just as academic stressors may be less relevant to a geriatric population).Additionally, Dohrenwend (2006) stated that methodological differences in self-report and narrative interview approaches to measuring life events make direct comparisons of effect sizes obtained by the two approaches generally impossible. Furthermore, Uher and McGuffin (2010) found that the results of prior meta-analyses with life events, specifically as moderated by genetic influences on depression, were confounded by this same methodological heterogeneity. As noted above, it was often unclear whether the life events interviews used in some studies were simply verbally administered life event checklists. Thus, for the purposes of a meta-analysis, it was impossible reliably to address this methodological heterogeneity.

Similarly, there is notable inconsistency across studies in assessment and operational definition of suicide attempts, particularly in terms of differentiating this phenomenon from NSSI. Whereas earlier studies often conflated suicidal behavior with NSSI (in which case they were excluded from the present review), or provided minimal or no information on how suicidal behavior was defined or assessed, deliberate care has been increasingly demonstrated in more recent studies to separate these two clinical phenomena. This, in large measure, is due to the growing recognition in recent years of NSSI as a distinct and important clinical concern in its own right. Given the still relative rarity of studies that provide sufficient detail in how they operationalized suicidal behavior to differentiate it from NSSI, to exclude studies from the current review on this basis would yield a false negative rate that we believe would not be justifiable for conducting a meta-analysis.

Under such cases where quite substantial methodological dissimilarities exist between studies, caution has been expressed against condensing the findings of a body of literature in a meta-analytic fashion (Walker, Hernandez, & Kattan, 2008), and indeed this very consideration has led several prior systematic reviews to adopt a narrative rather than meta-analytic approach (e.g., Marsoni et al., 1990; Nicolucci et al., 1989).

Finally, another condition of relevance to the current review, and for which considerable caution should be taken regarding conducting meta-analyses, is the presence of significant differences in sample size across studies. Although the sample size in most studies included in the current review ranged from 100 to 300, a few studies had quite sizeable samples (i.e., 10,631 in Taylor et al., 2005; and 102,245 in Stein et al., 2010), Meta-analyses do take into account different sample sizes in pooling the results of multiple publications, but studies with very large samples can unduly influence estimates of the average effect across a body of literature (see Walker et al., 2008 for a discussion of this issue).

4.2 . Summary and recommendations for future research

Although we found general support for life stressors, particularly within interpersonal domains, as a risk factor for suicidal ideation and

[6] Two additional studies adopted a prospective longitudinal design, but only reported cross-sectional analyses of the relation between life stressors and suicidal ideation and behavior. These studies were therefore not included in our count of longitudinal studies.

behavior, additional research is required before the findings in the literature can meaningfully inform clinical intervention efforts, especially in the case of suicidal ideation and suicide plans. Given methodological limitations prevalent in much of the current literature, particular caution should also be taken in terms of inferring causality in the relation between life stressors and suicidal ideation and behavior. Based on our review of the current literature and discussion of common methodological concerns, we presently outline several recommendations for future research in this area.

The use of purely clinical samples, rather than including community controls, is recommended for future studies of suicide attempts and psychological autopsy studies; the use of community controls, is problematic to the degree that any observed relation between life stressors and suicidal behavior may be a function of the very high rates of mental disorders in suicidal individuals (Nock, Hwang, Sampson, & Kessler, 2010; Nock et al., 2013), several of which disorders have themselves been well established in relation to life stressors (e.g., depression, Hammen, 2005).

Contextual threat life events interviews should be employed wherever possible, as they offer the greatest degree of accuracy in both dating of events and are sensitive to contextual considerations that may have an impact on the severity of each event. As noted above, they are also more immune than self-report inventories to idiosyncratic and subjective response biases. There may still be a place for self-report inventories, however, in large-scale studies for which feasibility considerations pose significant challenges to the use of life stress interviews and life stressors are not the primary subject of interest. In such cases, second generation life event inventories are a preferable option over traditional checklists such as the SRRS (see Dohrenwend, 2006; Liu, 2013 for more detailed discussions of this issue). An important consideration in the use of all life events measures is to adapt the events assessed to the population of interest (e.g., age appropriate events). Of particular clinical relevance, more research is required identifying the types of stressors most likely to precipitate suicidal ideation and behavior. Such work may aid in the identification of individuals at immediate risk for engaging in suicidal behavior and have implications for treatment strategies. For example, to the degree that dependent stressors are most relevant to suicide risk, behavior modification techniques focused on reducing the severity and frequency of these stressors may be especially apt. Conversely, if independent stressors are more likely to precipitate suicidal ideation and behavior, treatment strategies focusing more on the development of affect regulation and coping skills may offer a more promising means of intervention.

Similarly, interview-based measures of suicide plans and attempts are preferable to self-report measures to ensure endorsed suicide events are consistent with research criteria rather than based on respondents' idiosyncratic definitions. Related to this point, it would be important for future research to include an explicit assessment of suicidal intent to differentiate suicide attempts accurately from NSSI.

Finally, and in addition to adopting methodologically rigorous measures of life stressors and suicidal ideation and behavior, it is particularly important for future studies to utilize repeated assessments within a longitudinal design. Only through such means will it be possible to evaluate the extent to which life stressors predict suicidal ideation and behavior over and above other traditional risk factors (e.g., depression, Beck & Steer, 1989; hopelessness, Beck, Brown, Berchick and Stewart, 1990; and NSSI, Brent, 2011; Klonsky, May and Glenn, 2013). Also important is the need for briefer assessment intervals and greater temporal resolution, with a specific focus on life events proximal to the suicide event being predicted. The majority of extant studies assessed life stressors over timeframes of at least 12 months. Yet, just as most stressors conferring risk for other forms of psychopathology are generally proximal ones (e.g., those occurring within a month prior to depression onset, Hammen, 2005), this may similarly be the case for suicidal ideation and behavior.

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References

Adams, D.M., & Lehnert, K. L. (1997). Prolonged trauma and subsequent suicidal behavior: Child abuse and combat trauma reviewed. *Journal of Traumatic Stress*, *10*, 619–634. http://dx.doi.org/10.1023/A:1024897803655.

Adams, D.M., Overholser, J. C., & Spirito, A. (1994). Stressful life events associated with adolescent suicide attempts. *Canadian Journal of Psychiatry*, *39*, 43–48.

Altindag, A., Ozkan, M., & Oto, R. (2005). Suicide in Batman, Southeastern Turkey. *Suicide and Life-Threatening Behavior*, *35*, 478–482. http://dx.doi.org/10.1521/suli.2005.35.4.478.

Appleby, L., Cooper, J., Amos, T., & Faragher, B. (1999). Psychological autopsy study of suicides by people aged under 35. *British Journal of Psychiatry*, *175*, 168–174. http://dx.doi.org/10.1192/bjp.175.2.168.

Arie, M., Apter, A., Orbach, I., Yefet, Y., & Zalzman, G. (2008). Autobiographical memory, interpersonal problem solving, and suicidal behavior in adolescent inpatients. *Comprehensive Psychiatry*, *49*, 22–29. http://dx.doi.org/10.1016/j.comppsych.2007.07.004.

Asarnow, J. R., Porta, G., Spirito, A., Emslie, G., Clarke, G., Wagner, K. D., et al. (2011). Suicide attempts and nonsuicidal self-injury in the Treatment of Resistant Depression in Adolescents: Findings from the TORDIA study. *Journal of the American Academy of Child & Adolescent Psychiatry*, *50*, 772–781. http://dx.doi.org/10.1016/j.jaac.2011.04.003.

Azorin, J. -M., Kaladjian, A., Adida, M., Hantouche, E., Hameg, A., Lancrenon, S., et al. (2009). Risk factors associated with lifetime suicide attempts in bipolar I patients: Findings from a French national cohort. *Comprehensive Psychiatry*, *50*, 115–120. http://dx.doi.org/10.1016/j.comppsych.2008.07.004.

Baca-Garcia, E., Parra, C. P., Perez-Rodriguez, M. M., Sastre, C. D., Torres, R. R., Saiz-Ruiz, J., et al. (2007). Psychosocial stressors may be strongly associated with suicide attempts. *Stress and Health*, *23*, 191–198. http://dx.doi.org/10.1002/smi.1137.

Bangert-Drowns, R. L. (1995). Misunderstanding meta-analysis. *Evaluation & the Health Professions*, *18*, 304–314.

Beautrais, A. L. (2000). Risk factors for suicide and attempted suicide among young people. *Australian and New Zealand Journal of Psychiatry*, *34*, 420–436. http://dx.doi.org/10.1046/j.1440-1614.2000.00691.x.

Beck, A. T., Brown, G., Berchick, R. J., & Stewart, B.L. (1990). Relationship between hopelessness and ultimate suicide: A replication with psychiatric outpatients. *American Journal of Psychiatry*, *147*, 190–195.

Beck, A. T., & Steer, R. A. (1987). *Manual for the revised Beck Depression Inventory*. San Antonio, TX: Psychological Corportaion.

Beck, A. T., & Steer, R. A. (1989). Clinical predictors of eventual suicide: A 5- to 10-year prospective study of suicide attempters. *Journal of Affective Disorders*, *17*, 203–209. http://dx.doi.org/10.1016/0165-0327(89)90001-3.

Belik, S. -L., Cox, B. J., Stein, M. B., Asmundson, G. J. G., & Sareen, J. (2007). Traumatic events and suicidal behavior: Results from a national mental health survey. *Journal of Nervous and Mental Disease*, *195*, 342–349. http://dx.doi.org/10.1097/01.nmd.0b013e318060a869.

Belik, S. -L., Stein, M. B., Asmundson, G. J. G., & Sareen, J. (2009). Relation between traumatic events and suicide attempts in Canadian military personnel. *Canadian Journal of Psychiatry*, *54*, 93–104.

Blaauw, E., Arensman, E., Kraaij, V., Winkel, F. W., & Bout, R. (2002). Traumatic life events and suicide risk among jail inmates: The influence of types of events, time period and significant others. *Journal of Traumatic Stress*, *15*, 9–16. http://dx.doi.org/10.1023/A:1014323009493.

Borges, G., Benjet, C., Medina-Mora, M. E., Orozco, R., Molnar, B. E., & Nock, M. K. (2008). Traumatic events and suicide-related outcomes among Mexico City adolescents. *Journal of Child Psychology and Psychiatry*, *49*, 654–666. http://dx.doi.org/10.1111/j.1469-7610.2007.01868.x.

Brent, D. A. (1995). Risk factors for adolescent suicide and suicidal behavior: Mental and substance abuse disorders, family environmental factors, and life stress. *Suicide & Life-Threatening Behavior*, *25*(Suppl.), 52–63.

Brent, D. (2011). Nonsuicidal self-injury as a predictor of suicidal behavior in depressed adolescents. *American Journal of Psychiatry*, *168*, 452–454. http://dx.doi.org/10.1176/appi.ajp.2011.11020215.

Brent, D. A., Kolko, D. J., Allan, M. J., & Brown, R. V. (1990). Suicidality in affectively disordered adolescent inpatients. *Journal of the American Academy of Child & Adolescent Psychiatry*, *29*, 586–593. http://dx.doi.org/10.1097/00004583-199007000-00012.

Brent, D. A., Perper, J. A., Goldstein, C. E., & Kolko, D. J. (1988). Risk factors for adolescent suicide: A comparison of adolescent suicide victims with suicidal inpatients. *Archives of General Psychiatry*, *45*, 581–588.

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

Brent, D. A., Perper, J. A., Moritz, G., & Liotus, L. (1994). Familial risk factors for adolescent suicide: A case–control study. *Acta Psychiatrica Scandinavica*, *89*, 52–58. http://dx.doi.org/10.1111/j.1600-0447.1994.tb01485.x.

Bridge, J. A., Goldstein, T. R., & Brent, D. A. (2006). Adolescent suicide and suicidal behavior. *Journal of Child Psychology and Psychiatry*, *47*, 372–394. http://dx.doi.org/10.1111/j.1469-7610.2006.01615.x.

Brown, G. W., & Harris, T. O. (1978). *Social origins of depression*. New York: The Free Press.

Brown, G. W., & Harris, T. (1982). Fall-off in the reporting of life events. *Social Psychiatry*, *17*, 23–28. http://dx.doi.org/10.1007/BF00583889.

Casey, P. R., Dunn, G., Kelly, B.D., Birkbeck, G., Dalgard, O. S., Lehtinen, V., et al. (2006). Factors associated with suicidal ideation in the general population: Five-centre analysis from the ODIN study. *British Journal of Psychiatry*, *189*, 410–415. http://dx.doi.org/10.1192/bjp.bp.105.017368.

Caspi, A., Sugden, K., Moffitt, T. E., Taylor, A., Craig, I. W., Harrington, H., et al. (2003). Influence of life stress on depression: Moderation by a polymorphism in the 5-HTT gene. *Science*, *301*, 386–389. http://dx.doi.org/10.1126/science.1083968.

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. http://dx.doi.org/10.1007/s001270050187.

Centers for Disease Control and Prevention (2011). *Web-based injury statistics query and reporting system (WISQARS)*. Atlanta: GA: Centers for Disease Control and Prevention (Retrieved from http://www.cdc.gov/injury/wisqars/LeadingCauses.html).

Chang, E. C. (2002). Predicting suicide ideation in an adolescent population: Examining the role of social problem solving as a moderator and a mediator. *Personality and Individual Differences*, *32*, 1279–1291. http://dx.doi.org/10.1016/S0191-8869(01)00118-0.

Chang, E. C., Sanna, L. J., Hirsch, J. K., & Jeglic, E. L. (2010). Loneliness and negative life events as predictors of hopelessness and suicidal behaviors in Hispanics: Evidence for a diathesis–stress model. *Journal of Clinical Psychology*, *66*, 1242–1253. http://dx.doi.org/10.1002/jclp.20721.

Cheng, S. -T., & Chan, A.C. M. (2007). Multiple pathways from stress to suicidality and the protective effect of social support in Hong Kong adolescents. *Suicide and Life-Threatening Behavior*, *37*, 187–196. http://dx.doi.org/10.1521/suli.2007.37.2.187.

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. *British Journal of Psychiatry*, *177*, 360–365. http://dx.doi.org/10.1192/bjp.177.4.360.

Cole, D. E., Protinsky, H. O., & Cross, L. H. (1992). An empirical investigation of adolescent suicidal ideation. *Adolescence*, *27*, 813–818.

Cuddy-Casey, M., & Orvaschel, H. (1997). Children's understanding of death in relation to child suicidality and homicidality. *Clinical Psychology Review*, *17*, 33–45. http://dx.doi.org/10.1016/S0272-7358(96)00044-X.

De Vanna, M., Paterniti, S., Milievich, C., & Rigamonti, R. (1990). Recent life events and attempted suicide. *Journal of Affective Disorders*, *18*, 51–58. http://dx.doi.org/10.1016/0165-0327(90)90116-P.

de Wilde, E. J., Kienhorst, I. C., Diekstra, R. F., & Wolters, W. H. (1992). The relationship between adolescent suicidal behavior and life events in childhood and adolescence. *American Journal of Psychiatry*, *149*, 45–51.

Dean, P. J., & Range, L. M. (1999). Testing the Escape Theory of Suicide in an outpatient clinical population. *Cognitive Therapy and Research*, *23*, 561–572. http://dx.doi.org/10.1023/A:1018728606568.

DeJong, T. M., Overholser, J. C., & Stockmeier, C. A. (2010). Apples to oranges?: A direct comparison between suicide attempters and suicide completers. *Journal of Affective Disorders*, *124*, 90–97. http://dx.doi.org/10.1016/j.jad.2009.10.020.

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. http://dx.doi.org/10.1037/0033-2909.132.3.477.

Duberstein, P. R., Conwell, Y., Conner, K. R., Eberly, S., & Caine, E. D. (2004). Suicide at 50 years of age and older: Perceived physical illness, family discord and financial strain. *Psychological Medicine*, *34*, 137–146. http://dx.doi.org/10.1017/S0033291703008584.

Dubow, E. F., Kausch, D. F., Blum, M. C., & Reed, J. (1989). Correlates of suicidal ideation and attempts in a community sample of junior high and high school students. *Journal of Clinical Child Psychology*, *18*, 158–166. http://dx.doi.org/10.1207/s15374424jccp1802_7.

Dupéré, V., Leventhal, T., & Lacourse, É. (2009). Neighborhood poverty and suicidal thoughts and attempts in late adolescence. *Psychological Medicine*, *39*, 1295–1306. http://dx.doi.org/10.1017/S003329170800456X.

Espejo, E. P., Ferriter, C. T., Hazel, N. A., Keenan-Miller, D., Hoffman, L. R., & Hammen, C. (2011). Predictors of subjective ratings of stressor severity: The effects of current mood and neuroticism. *Stress and Health*, *27*, 23–33. http://dx.doi.org/10.1002/smi.1315.

Esposito, C. L., & Clum, G. A. (2003). The relative contribution of diagnostic and psychosocial factors in the prediction of adolescent suicidal ideation. *Journal of Clinical Child & Adolescent Psychology*, *32*, 386–395. http://dx.doi.org/10.1207/S15374424JCCP3203_07.

Fairweather, A. K., Anstey, K. J., Rodgers, B., & Butterworth, P. (2006). Factors distinguishing suicide attempters from suicide ideators in a community sample: Social issues and physical health problems. *Psychological Medicine*, *36*, 1235–1245. http://dx.doi.org/10.1017/S0033291706007823.

Fanous, A. H., Prescott, C. A., & Kendler, K. S. (2004). The prediction of thoughts of death or self-harm in a population-based sample of female twins. *Psychological Medicine*, *34*, 301–312. http://dx.doi.org/10.1017/S0033291703008857.

Fergusson, D.M., Woodward, L. J., & Horwood, L. J. (2000). Risk factors and life processes associated with the onset of suicidal behaviour during adolescence and early adulthood. *Psychological Medicine*, *30*, 23–39. http://dx.doi.org/10.1017/S003329179900135X.

Foster, T. (2011). Adverse life events proximal to adult suicide: A synthesis of findings from psychological autopsy studies. *Archives of Suicide Research*, *15*, 1–15. http://dx.doi.org/10.1080/13811118.2011.540213.

Foster, T., Gillespie, K., McClelland, R., & Patterson, C. (1999). Risk factors for suicide independent of DSM-III—R Axis I disorder: Case–control psychological autopsy study in Northern Ireland. *British Journal of Psychiatry*, *175*, 175–179. http://dx.doi.org/10.1192/bjp.175.2.175.

Garrison, C. Z., Addy, C. L., Jackson, K. L., & McKeown, R. E. (1991). A longitudinal study of suicidal ideation in young adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry*, *30*, 597–603. http://dx.doi.org/10.1097/00004583-199107000-00011.

Garrison, C. Z., Jackson, K. L., Addy, C. L., McKeown, R. E., & Waller, J. L. (1991). Suicidal behaviors in young adolescents. *American Journal of Epidemiology*, *133*, 1005–1014.

Goldney, R. D., Wilson, D., Dal Grande, E., Fisher, L. J., & McFarlane, A.C. (2000). Suicidal ideation in a random community sample: Attributable risk due to depression and psychosocial and traumatic events. *Australian and New Zealand Journal of Psychiatry*, *34*, 98–106. http://dx.doi.org/10.1046/j.1440-1614.2000.00646.x.

Goodyer, I. M. (1990). Recent life events and psychiatric disorder in school age children. *Journal of Child Psychology and Psychiatry*, *31*, 839–848. http://dx.doi.org/10.1111/j.1469-7610.1990.tb00828.x.

Gorman, D.M. (1993). A review of studies comparing checklist and interview methods of data collection in life event research. *Behavioral Medicine*, *19*, 66–73.

Gould, M. S. (2003). Youth suicide risk and preventive interventions: A review of the past 10 years. *Journal of the American Academy of Child & Adolescent Psychiatry*, *42*, 386–405. http://dx.doi.org/10.1097/01.CHI.0000046821.95464.CF.

Grant, K. E., Compas, B. E., Stuhlmacher, A. F., Thurm, A. E., McMahon, S. D., & Halpert, J. A. (2003). Stressors and child and adolescent psychopathology: Moving from markers to mechanisms of risk. *Psychological Bulletin*, *129*, 447–466. http://dx.doi.org/10.1037/0033-2909.129.3.447.

Grover, K. E., Green, K. L., Pettit, J. W., Monteith, L. L., Garza, M. J., & Venta, A. (2009). Problem solving moderates the effects of life event stress and chronic stress on suicidal behaviors in adolescence. *Journal of Clinical Psychology*, *65*, 1281–1290. http://dx.doi.org/10.1002/jclp.20632.

Haavisto, A., Sourander, A., Multimäki, P., Parkkola, K., Santalahti, P., Helenius, H., et al. (2005). Factors associated with ideation and acts of deliberate self-harm among 18-year-old boys: A prospective 10-year follow-up study. *Social Psychiatry and Psychiatric Epidemiology*, *40*, 912–921. http://dx.doi.org/10.1007/s00127-005-0966-2.

Hammen, C. (1991). Generation of stress in the course of unipolar depression. *Journal of Abnormal Psychology*, *100*, 555–561. http://dx.doi.org/10.1037/0021-843X.100.4.555.

Hammen, C. (2005). Stress and depression. *Annual Review of Clinical Psychology*, *1*, 293–319. http://dx.doi.org/10.1146/annurev.clinpsy.1.102803.143938.

Hammen, C., Marks, T., Mayol, A., & DeMayo, R. (1985). Depressive self-schemas, life stress, and vulnerability to depression. *Journal of Abnormal Psychology*, *94*, 308–319. http://dx.doi.org/10.1037/0021-843X.94.3.308.

Hamza, C. A., Stewart, S. L., & Willoughby, T. (2012). Examining the link between nonsuicidal self-injury and suicidal behavior: A review of the literature and an integrated model. *Clinical Psychology Review*, *32*, 482–495. http://dx.doi.org/10.1016/j.cpr.2012.05.003.

Hankin, B.L., & Abela, J. R. Z. (2011). Nonsuicidal self-injury in adolescence: Prospective rates and risk factors in a 2 ½ year longitudinal study. *Psychiatry Research*, *186*, 65–70. http://dx.doi.org/10.1016/j.psychres.2010.07.056.

Harder, D. W., Strauss, J. S., Kokes, R. F., Ritzler, B.A., & Gift, T. E. (1980). Life events and psychopathology severity among first psychiatric admissions. *Journal of Abnormal Psychology*, *89*, 165–180. http://dx.doi.org/10.1037/0021-843X.89.2.165.

Hawton, K., Saunders, K. E. A., & O'Connor, R. C. (2012). Self-harm and suicide in adolescents. *Lancet*, *379*, 2373–2382. http://dx.doi.org/10.1016/S0140-6736(12)60322-5.

Hintikka, J., Koivumaa-Honkanen, H., Lehto, S. M., Tolmunen, T., Honkalampi, K., Haatainen, K., et al. (2009). Are factors associated with suicidal ideation true risk factors? A 3-year prospective follow-up study in a general population. *Social Psychiatry and Psychiatric Epidemiology*, *44*, 29–33. http://dx.doi.org/10.1007/s00127-008-0401-6.

Holmes, T. H., & Rahe, R. H. (1967). The social readjustment rating scale. *Journal of Psychosomatic Research*, *11*, 213–218. http://dx.doi.org/10.1016/0022-3999(67)90010-4.

Innamorati, M., Pompili, M., Masotti, V., Personé, F., Lester, D., Tatarelli, R., et al. (2008). Completed versus attempted suicide in psychiatric patients: A psychological autopsy study. *Journal of Psychiatric Practice*, *14*, 216–224. http://dx.doi.org/10.1097/01.pra.0000327311.04153.01.

Jacobs, S., & Myers, J. (1976). Recent life events and acute schizophrenic psychosis: A controlled study. *Journal of Nervous and Mental Disease*, *162*, 75–87.

Johnson, S. L. (2005). Life events in bipolar disorder: Towards more specific models. *Clinical Psychology Review*, *25*, 1008–1027. http://dx.doi.org/10.1016/j.cpr.2005.06.004.

Johnson, S. L., & Roberts, J. E. (1995). Life events and bipolar disorder: Implications from biological theories. *Psychological Bulletin*, *117*, 434–449. http://dx.doi.org/10.1037/0033-2909.117.3.434.

Joiner, T. E. (2003). Contagion of suicidal symptoms as a function of assortative relating and shared relationship stress in college roommates. *Journal of Adolescence*, *26*, 495–504. http://dx.doi.org/10.1016/S0140-1971(02)00133-1.

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

Joiner, T. E., & Rudd, M.D. (1995). Negative attributional style for interpersonal events and the occurence of severe interpersonal disruptions as predictors of self-reported suicidal ideation. *Suicide and Life-Threatening Behavior*, *25*, 297–304.

Kaslow, N. J., Sherry, A., Bethea, K., Wyckoff, S., Compton, M. T., Grall, M. B., et al. (2005). Social risk and protective factors for suicide attempts in low income African American men and women. *Suicide and Life-Threatening Behavior*, *35*, 400–412. http://dx.doi.org/10.1521/suli.2005.35.4.400.

Kaslow, N. J., Thompson, M. P., Okun, A., Price, A., Young, S., Bender, M., et al. (2002). Risk and protective factors for suicidal behavior in abused African American women.

Journal of Consulting and Clinical Psychology, *70*, 311–319. http://dx.doi.org/10.1037/0022-006X.70.2.311.

Kelly, T. M., Soloff, P. H., Lynch, K. G., Haas, G. L., & Mann, J. J. (2000). Recent life events, social adjustment, and suicide attempts in patients with major depression and borderline personality disorder. *Journal of Personality Disorders*, *14*, 316–326.

Kessler, R. C. (1997). The effects of stressful life events on depression. *Annual Review of Psychology*, *48*, 191–214. http://dx.doi.org/10.1146/annurev.psych.48.1.191.

Kessler, R. C., Berglund, P., Borges, G., Nock, M., & Wang, P.S. (2005). Trends in suicide ideation, plans, gestures, and attempts in the United States, 1990–1992 to 2001–2003. *JAMA*, *293*, 2487–2495. http://dx.doi.org/10.1001/jama.293.20.2487.

Khan, M. M., Mahmud, S., Karim, M. S., Zaman, M., & Prince, M. (2008). Case–control study of suicide in Karachi, Pakistan. *British Journal of Psychiatry*, *193*, 402–405. http://dx.doi.org/10.1192/bjp.bp.107.042069.

King, C. A., Raskin, A., Gdowski, C. L., & Butkus, M. (1990). Psychosocial factors associated with urban adolescent female suicide attempts. *Journal of the American Academy of Child & Adolescent Psychiatry*, *29*, 289–294. http://dx.doi.org/10.1097/00004583-199003000-00020.

King, R. A., Schwab-Stone, M., Flisher, A. J., Greenwald, S., Kramer, R. A., Goodman, S. H., et al. (2001). Psychosocial and risk behavior correlates of youth suicide attempts and suicidal ideation. *Journal of the American Academy of Child & Adolescent Psychiatry*, *40*, 837–846. http://dx.doi.org/10.1097/00004583-200107000-00019.

Kirmayer, L. J., Boothroyd, L. J., & Hodgins, S. (1998). Attempted suicide among Inuit youth: Psychosocial correlates and implications for prevention. *Canadian Journal of Psychiatry*, *43*, 816–822.

Klonsky, E. D., May, A.M., & Glenn, C. R. (2013). The relationship between nonsuicidal self-injury and attempted suicide: Converging evidence from four samples. *Journal of Abnormal Psychology*, *122*, 231–237. http://dx.doi.org/10.1037/a0030278.

Kumar, C. T. S., Mohan, R., Ranjith, G., & Chandrasekaran, R. (2006). Characteristics of high intent suicide attempters admitted to a general hospital. *Journal of Affective Disorders*, *91*, 77–81. http://dx.doi.org/10.1016/j.jad.2005.12.028.

Kuo, W. -H., & Gallo, J. J. (2005). Completed suicide after a suicide attempt. *American Journal of Psychiatry*, *162*, 633. http://dx.doi.org/10.1176/appi.ajp.162.3.633.

Lam, B. C. P., Bond, M. H., Chen, S. X., & Wu, W. C. H. (2010). Worldviews and individual vulnerability to suicide: The role of social axioms. *European Journal of Personality*, *24*, 602–622.

Lawlor, M., Corcoran, P., & Chambers, D. (2000). Suicide attempts v. deliberate self-harm: A response. *British Journal of Psychiatry*, *176*, 91–92. http://dx.doi.org/10.1192/bjp.176.1.91-a.

Li, X. Y., Phillips, M. R., Zhang, Y. P., Xu, D., & Yang, G. H. (2008). Risk factors for suicide in China's youth: A case–control study. *Psychological Medicine*, *38*, 397–406. http://dx.doi.org/10.1017/S0033291707001407.

Liu, R. T. (2013). Stress generation: Future directions and clinical implications. *Clinical Psychology Review*, *33*, 406–416. http://dx.doi.org/10.1016/j.cpr.2013.01.005.

Liu, X., & Tein, J. -Y. (2005). Life events, psychopathology, and suicidal behavior in Chinese adolescents. *Journal of Affective Disorders*, *86*, 195–203. http://dx.doi.org/10.1016/j.jad.2005.01.016.

Mann, J. J., Apter, A., Bertolote, J., Beautrais, A., Currier, D., Haas, A., et al. (2005). Suicide prevention strategies: A systematic review. *JAMA*, *294*, 2064–2074. http://dx.doi.org/10.1001/jama.294.16.2064.

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

Marsoni, S., Torri, W., Taiana, A., Gambino, A., Grilli, R., Liati, P., et al. (1990). Critical review of the quality and development of randomized clinical trials (RCTs) and their influence on the treatment of advanced epithelial ovarian cancer. *Annals of Oncology*, *1*, 343–350.

Mazza, J. J., & Reynolds, W. M. (1998). A longitudinal investigation of depression, hopelessness, social support, and major and minor life events and their relation to suicidal ideation in adolescents. *Suicide and Life-Threatening Behavior*, *28*, 358–374.

McKeown, R. E., Garrison, C. Z., Cuffe, S. P., Waller, J. L., Jackson, K. L., & Addy, C. L. (1998). Incidence and predictors of suicidal behaviors in a longitudinal sample of young adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry*, *37*, 612–619. http://dx.doi.org/10.1097/00004583-199806000-00011.

Monroe, S. M. (2008). Modern approaches to conceptualizing and measuring human life stress. *Annual Review of Clinical Psychology*, *4*, 33–52. http://dx.doi.org/10.1146/annurev.clinpsy.4.022007.141207.

Monroe, S. M., Harkness, K., Simons, A., & Thase, M. (2001). Life stress and the symptoms of major depression. *Journal of Nervous and Mental Disease*, *189*, 168–175. http://dx.doi.org/10.1097/00005053-200103000-00005.

Monroe, S. M., & Reid, M. W. (2008). Gene-environment interactions in depression research: Genetic polymorphisms and life-stress polyprocedures. *Psychological Science*, *19*, 947–956. http://dx.doi.org/10.1111/j.1467-9280.2008.02181.x.

Nicolucci, A., Grilli, R., Alexanian, A. A., Apolone, G., Torri, V., & Liberati, A. (1989). Quality, evolution, and clinical implications of randomized, controlled trials on the treatment of lung cancer. A lost opportunity for meta-analysis. *JAMA*, *262*, 2101–2107.

Nock, M. K., Borges, G., Bromet, E. J., Cha, C. B., Kessler, R. C., & Lee, S. (2008). Suicide and suicidal behavior. *Epidemiologic Reviews*, *30*, 133–154. http://dx.doi.org/10.1093/epirev/mxn002.

Nock, M. K., Green, J. G., Hwang, I., McLaughlin, K. A., Sampson, N. A., Zaslavsky, A.M., et al. (2013). Prevalence, correlates, and treatment of lifetime suicidal behavior among adolescents: Results from the National Comorbidity Survey Replication Adolescent Supplement. *JAMA Psychiatry*, *70*, 300–310. http://dx.doi.org/10.1001/2013.jamapsychiatry.55.

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. *Psychological Assessment*, *19*, 309–317. http://dx.doi.org/10.1037/1040-3590.19.3.309.

Nock, M. K., Hwang, I., Sampson, N. A., & Kessler, R. C. (2010). Mental disorders, comorbidity and suicidal behavior: Results from the National Comorbidity Survey replication. *Molecular Psychiatry*, *15*, 868–876. http://dx.doi.org/10.1038/mp.2009.29.

Nock, M. K., & Kessler, R. C. (2006). Prevalence of and risk factors for suicide attempts versus suicide gestures: Analysis of the National Comorbidity Survey. *Journal of Abnormal Psychology*, *115*, 616–623. http://dx.doi.org/10.1037/0021-843X.115.3.616.

Nrugham, L., Holen, A., & Sund, A.M. (2010). Associations between attempted suicide, violent life events, depressive symptoms, and resilience in adolescents and young adults. *Journal of Nervous and Mental Disease*, *198*, 131–136. http://dx.doi.org/10.1097/NMD.0b013e3181cc43a2.

O'Connor, R. C., Rasmussen, S., & Hawton, K. (2012). Distinguishing adolescents who think about self-harm from those who engage in self-harm. *British Journal of Psychiatry*, *200*, 330–335. http://dx.doi.org/10.1192/bjp.bp.111.097808.

Orbach, I., Stein, D., Palgi, Y., & Asherov, J. (1996). Perception of physical pain in accident and suicide attempt patients: Self-preservation vs self-destruction. *Journal of Psychiatric Research*, *30*, 307–320. http://dx.doi.org/10.1016/0022-3956(96)00008-8.

Özer, S., Uluşahin, A., Batur, S., Kabakçi, E., & Can Saka, M. (2002). Outcome measures of interepisode bipolar patients in a Turkish sample. *Social Psychiatry and Psychiatric Epidemiology*, *37*, 31–37. http://dx.doi.org/10.1007/s127-002-8211-z.

Palacio, C., García, J., Diago, J., Zapata, C., Lopez, G., Ortiz, J., et al. (2007). Identification of suicide risk factors in Medellín, Colombia: A case–control study of psychological autopsy in a developing country. *Archives of Suicide Research*, *11*, 297–308. http://dx.doi.org/10.1080/13811110600894223.

Paykel, E. S. (1983). Methodological aspects of life events research. *Journal of Psychosomatic Research*, *27*, 341–352.

Paykel, E. S. (1997). The interview for recent life events. *Psychological Medicine*, *27*, 301–310. http://dx.doi.org/10.1017/S0033291796004424.

Paykel, E. S., Myers, J. K., Lindenthal, J. J., & Tanner, J. (1974). Suicidal feelings in the general population: A prevalence study. *British Journal of Psychiatry*, *124*, 460–469. http://dx.doi.org/10.1192/bjp.124.5.460.

Pokorny, A.D., & Kaplan, H. B. (1976). Suicide following psychiatric hospitalization. *Journal of Nervous and Mental Disease*, *162*, 119–125. http://dx.doi.org/10.1097/00005053-197602000-00006.

Posner, K., Brown, G. K., Stanley, B., Brent, D. A., Yershova, K. V., Oquendo, M.A., et al. (2011). The Columbia–Suicide Severity Rating Scale: Initial validity and internal consistency findings from three multisite studies with adolescents and adults. *American Journal of Psychiatry*, *168*, 1266–1277. http://dx.doi.org/10.1176/appi.ajp.2011.10111704.

Power, K. G., Cooke, D. J., & Brooks, D. N. (1985). Life stress, medical lethality, and suicidal intent. *British Journal of Psychiatry*, *147*, 655–659. http://dx.doi.org/10.1192/bjp.147.6.655.

Reinecke, M.A., & DuBois, D. L. (2001). Socioenvironmental and cognitive risk and resources: Relations to mood and suicidality among inpatient adolescents. *Journal of Cognitive Psychotherapy*, *15*, 195–222.

Rohde, P., Seeley, J. R., & Mace, D. E. (1997). Correlates of suicidal behavior in a juvenile detention population. *Suicide and Life-Threatening Behavior*, *27*, 164–175.

Rubenowitz, E., Waern, M., Wilhelmson, K., & Allebeck, P. (2001). Life events and psychosocial factors in elderly suicides—A case–control study. *Psychological Medicine*, *31*, 1193–1202. http://dx.doi.org/10.1017/S0033291701004457.

Santa Mina, E. E., & Gallop, R. M. (1998). Childhood sexual and physical abuse and adult self-harm and suicidal behaviour: A literature review. *Canadian Journal of Psychiatry*, *43*, 793–800.

Sapyta, J., Goldston, D. B., Erkanli, A., Daniel, S. S., Heilbron, N., Mayfield, A., et al. (2012). Evaluating the predictive validity of suicidal intent and medical lethality in youth. *Journal of Consulting and Clinical Psychology*, *80*, 222–231. http://dx.doi.org/10.1037/a0026870.

Schillani, G., Goljevscek, S., Carlino, D., De Vanna, M., Aguglia, E., & Giraldi, T. (2009). Repeated suicidal behaviour: Stressful life events and 5-HTTLPR genetic polymorphism. *International Journal of Psychiatry in Clinical Practice*, *13*, 229–232. http://dx.doi.org/10.1080/13651500902785652.

Spirito, A., & Esposito-Smythers, C. (2006). Attempted and completed suicide in adolescence. *Annual Review of Clinical Psychology*, *2*, 237–266. http://dx.doi.org/10.1146/annurev.clinpsy.2.022305.095323.

Statham, D. J., Heath, A.C., Madden, P. A. F., Bucholz, K. K., Bierut, L., Dinwiddie, S. H., et al. (1998). Suicidal behaviour: An epidemiological and genetic study. *Psychological Medicine*, *28*, 839–855. http://dx.doi.org/10.1017/S0033291798006916.

Stein, D. J., Chiu, W. T., Hwang, I., Kessler, R. C., Sampson, N., Alonso, J., et al. (2010). Cross-national analysis of the associations between traumatic events and suicidal behavior: Findings from the WHO World Mental Health Surveys. *PLoS ONE*, *5*. http://dx.doi.org/10.1371/journal.pone.0010574.

Steinhausen, H. -C., Bösiger, R., & Metzke, C. W. (2006). Stability, correlates, and outcome of adolescent suicidal risk. *Journal of Child Psychology and Psychiatry*, *47*, 713–722. http://dx.doi.org/10.1111/j.1469-7610.2005.01569.x.

Strosahl, K., Chiles, J. A., & Linehan, M. (1992). Prediction of suicide intent in hospitalized parasuicides: Reasons for living, hopelessness, and depression. *Comprehensive Psychiatry*, *33*, 366–373. http://dx.doi.org/10.1016/0010-440X(92)90057-W.

Taylor, R., Page, A., Morrell, S., Harrison, J., & Carter, G. (2005). Mental health and socio-economic variations in Australian suicide. *Social Science & Medicine*, *61*, 1551–1559. http://dx.doi.org/10.1016/j.socscimed.2005.02.009.

Tejedor, M. C., Castillón, J. J., Pericay, J. M., & Puigdellivol, M. (1987). Suicidal behavior in schizophrenia. *Crisis*, *8*, 151–161.

Thompson, R., Kane, V., Cook, J. M., Greenstein, R., Walker, P., & Woody, G. (2006). Suicidal ideation in veterans receiving treatment for opiate dependence. *Journal of Psychoactive Drugs*, *38*, 149–156.

Tsoh, J., Chiu, H. F. K., Duberstein, P. R., Chan, S. S. M., Chi, I., Yip, P.S. F., et al. (2005). Attempted suicide in elderly Chinese persons: A multi-group, controlled study.

American Journal of Geriatric Psychiatry, *13*, 562–571. http://dx.doi.org/10.1176/appi.ajgp.13.7.562.

Turvey, C., Stromquist, A., Kelly, K., Zwerling, C., & Merchant, J. (2002). Financial loss and suicidal ideation in a rural community sample. *Acta Psychiatrica Scandinavica*, *106*, 373–380. http://dx.doi.org/10.1034/j.1600-0447.2002.02340.x.

Uher, R., & McGuffin, P. (2010). The moderation by the serotonin transporter gene of environmental adversity in the etiology of depression: 2009 update. *Molecular Psychiatry*, *15*, 18–22. http://dx.doi.org/10.1038/mp.2009.123.

Ullman, S. (2004). Sexual assault victimization and suicidal behavior in women: A review of the literature. *Aggression and Violent Behavior*, *9*, 331–351. http://dx.doi.org/10.1016/S1359-1789(03)00019-3.

Ullman, S. E., & Brecklin, L. R. (2002). Sexual assault history and suicidal behavior in a national sample of women. *Suicide and Life-Threatening Behavior*, *32*, 117–130. http://dx.doi.org/10.1521/suli.32.2.117.24398.

van Leeuwen, N., Rodgers, R., Régner, I., & Chabrol, H. (2010). The role of acculturation in suicidal ideation among second-generation immigrant adolescents in France. *Transcultural Psychiatry*, *47*, 812–832. http://dx.doi.org/10.1177/1363461510382154.

Vázquez, J. J., Panadero, S., & Rincón, P. P. (2010). Stressful life events and suicidal behaviour in countries with different development levels: Nicaragua, El Salvador, Chile and Spain. *Journal of Community & Applied Social Psychology*, *20*, 288–298. http://dx.doi.org/10.1002/casp.1036.

Vijayakumar, L., & Rajkumar, S. (1999). Are risk factors for suicide universal? A case–control study in India. *Acta Psychiatrica Scandinavica*, *99*, 407–411. http://dx.doi.org/10.1111/j.1600-0447.1999.tb00985.x.

Vilhjalmsson, R., Krisjansdottir, G., & Sveinbjarnardottir, E. (1998). Factors associated with suicide ideation in adults. *Social Psychiatry and Psychiatric Epidemiology*, *33*, 97–103. http://dx.doi.org/10.1007/s001270050028.

Waelde, L. C., Silvern, L., & Hodges, W. F. (1994). Stressful life events: Moderators of the relationships of gender and gender roles to self-reported depression and suicidality among college students. *Sex Roles*, *30*, 1–22. http://dx.doi.org/10.1007/BF01420737.

Waern, M., Rubenowitz, E., & Wilhelmson, K. (2003). Predictors of suicide in the old elderly. *Gerontology*, *49*, 328–334. http://dx.doi.org/10.1159/000071715.

Wahlström, L., Michélsen, H., Schulman, A., & Backheden, M. (2010). Childhood life events and psychological symptoms in adult survivors of the 2004 Tsunami. *Nordic Journal of Psychiatry*, *64*, 245–252. http://dx.doi.org/10.3109/08039480903484092.

Walker, E., Hernandez, A. V., & Kattan, M. W. (2008). Meta-analysis: Its strengths and limitations. *Cleveland Clinic Journal of Medicine*, *75*, 431–439.

Wan, G. W. Y., & Leung, P. W. L. (2010). Factors accounting for youth suicide attempt in Hong Kong: A model building. *Journal of Adolescence*, *33*, 575–582. http://dx.doi.org/10.1016/j.adolescence.2009.12.007.

Wenzel, A., & Beck, A. T. (2008). A cognitive model of suicidal behavior: Theory and treatment. *Applied and Preventive Psychology*, *12*, 189–201. http://dx.doi.org/10.1016/j.appsy.2008.05.001.

Williamson, D. E., Birmaher, B., Anderson, B. P., & Al-Shabbout, M. (1995). Stressful life events in depressed adolescents: The role of dependent events during the depressive episode. *Journal of the American Academy of Child & Adolescent Psychiatry*, *34*, 591–598. http://dx.doi.org/10.1097/00004583-199505000-00011.

Wilson, K. G., Stelzer, J., Bergman, J. N., & Kral, M. J. (1995). Problem solving, stress, and coping in adolescent suicide attempts. *Suicide and Life-Threatening Behavior*, *25*, 241–252.

Wong, J. P.S., Stewart, S. M., Claassen, C., Lee, P. W. H., Rao, U., & Lam, T. H. (2008). Repeat suicide attempts in Hong Kong community adolescents. *Social Science & Medicine*, *66*, 232–241. http://dx.doi.org/10.1016/j.socscimed.2007.08.031.

Wong, J. P.S., Stewart, S. M., Ho, S. Y., Rao, U., & Lam, T. H. (2005). Exposure to suicide and suicidal behaviors among Hong Kong adolescents. *Social Science & Medicine*, *61*, 591–599. http://dx.doi.org/10.1016/j.socscimed.2004.12.012.

Yang, B., & Clum, G. A. (1996). Effects of early negative life experiences on cognitive functioning and risk for suicide: A review. *Clinical Psychology Review*, *16*, 177–195. http://dx.doi.org/10.1016/S0272-7358(96)00004-9.

Yen, S., Pagano, M. E., Shea, M. T., Grilo, C. M., Gunderson, J. G., Skodol, A. E., et al. (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. http://dx.doi.org/10.1037/0022-006X.73.1.99.

Yoder, K. A., Whitbeck, L. B., Hoyt, D. R., & LaFromboise, T. (2006). Suicide ideation among American Indian youths. *Archives of Suicide Research*, *10*, 177–190. http://dx.doi.org/10.1080/13811110600558240.

Zhang, J., Conwell, Y., Zhou, L., & Jiang, C. (2004). Culture, risk factors and suicide in rural China: A psychological autopsy case control study. *Acta Psychiatrica Scandinavica*, *110*, 430–437. http://dx.doi.org/10.1111/j.1600-0447.2004.00388.x.

Zhang, J., Xiao, S., & Zhou, L. (2010). Mental disorders and suicide among young rural Chinese: A case–control psychological autopsy study. *American Journal of Psychiatry*, *167*, 773–781. http://dx.doi.org/10.1176/appi.ajp.2010.09101476.

Zhang, J., & Zhou, L. (2009). A case control study of suicides in China with and without mental disorder. *Crisis*, *30*, 68–72. http://dx.doi.org/10.1027/0227-5910.30.2.68.