The Integration of Stressful Life Experiences Scale (ISLES): Development and Initial Validation of a New Measure

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Making meaning out of life stressors has been proposed as a crucial mechanism by which individuals adjust to these experiences. However, an easy-to-use, multidimensional, and well-validated measure of the meaning made after a stressful life event has not been developed and tested. Thus, the present study tested the reliability and validity of scores for a newly developed measure called the Integration of Stressful Life Experiences Scale (ISLES). In 2 samples of young adults—1 that experienced a variety of stressors (n = 178) and another that experienced a recent bereavement (n = 150)—ISLES scores were shown to have strong internal consistency and, among a subsample of participants, also exhibited moderate test–retest reliability. In both samples, support was also found for a 2-factor structure, with 1 factor assessing one's sense of having some footing in the world *following the stressful life event and the other gauging the* comprehensibility *of the stressor. Convergent validity analyses revealed that ISLES scores are*

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strongly associated with other theoretically related measures and with mental and physical health outcomes, offering support for the potential utility of this measure in research and clinical settings.

Theorists from a number of perspectives have conceptualized maladjustment to stressful life experiences as arising from an inability to integrate memories of the event into a coherent life story that makes sense and allows for a purposeful future (Ehlers & Clark, 2000; Janoff-Bulman, 1992; Neimeyer, 2006; Siegel, 1995; van der Kolk & van der Hart, 1991; Wigren, 1994). From a physiological perspective, memories encoded under stressful conditions are frequently underorganized and resist cortical processing (Siegel, 1995; van der Kolk & van der Hart, 1991). In narrative terms, these difficult memories at least partly signify a breakdown in the ability to organize a problematic "micronarrative" into a broader "macronarrative" that consolidates one's self-understanding, establishes a characteristic range of emotions and goals, and guides one's engagement in the social world (Neimeyer, 2004). The fragmented recollections associated with a stressful life experience could, therefore, be considered "prenarrative" in that they circumvent autobiographical memory processes that may serve to contextualize the event in one's overall sense of identity. The intention of the present study was to develop and test a brief and easy-to-use measure that gauges the extent to which a stressful life event has been adaptively integrated into the broader macronarrative of one's life.

The process of narrative integration may be thought of as occurring in two ways. First, stressful life experiences could be *assimilated* within one's existing models of the self and world fashioned in accordance with previous life experiences. However, as is often the case following trauma or other stressful life experiences, a second possibility pertains to instances when the individual is not able to make sense of the experience in the context of his or her internal models. In such a case, preexisting models may be altered to *accommodate* the discrepant information (Janoff-Bulman, 1989; Neimeyer, 2006).

A related distinction has been made between meaning as comprehensibility and meaning as significance (Janoff-Bulman & Frantz, 1997). Comprehension of a stressful life event (also referred to as sense-making) may represent a more assimilative process in which one integrates an event without fundamentally altering existing meaning structures. In contrast, finding a sense of significance in a stressful life experience may be more of an accommodative process that involves adapting one's internal world to better fit or align with new life circumstances (Joseph & Linley, 2005). Although meaning as significance has typically been equated with personal growth or

benefit-finding (Calhoun & Tedeschi, 2006), others have argued for a broader conceptualization of this domain as including any alteration of one's personal world of meaning to accommodate a stressful life event, whether this change is positive or negative (Currier, Holland, & Neimeyer, 2009; Joseph & Linley, 2005).

Several measures of assimilative and accommodative integration have been developed previously with varying strengths and limitations. Most commonly, researchers have relied on single-item measures of sense-making and benefit-finding. Although these single-item measures have been shown to be useful in predicting detrimental psychological outcomes (e.g., Davis, Nolen-Hoeksema, & Larson, 1998; Updegraff, Silver, & Holman, 2008), they are limited in their ability to capture the full spectrum of variability and (possible) multidimensional nature of these constructs. Another related measure, the Assimilation of Problematic Experiences Scale (Stiles & Angus, 2001), attempts to capture a developmental sequence of recognizing, reformulating, understanding, and eventually resolving a problematic experience. However, this method is primarily used in a psychotherapy context and requires extensive coding of qualitative data, such that it may not be practical with large samples or as a screening measure in a clinical context. The Making Sense of Adversity Scale (Pan, Wong, Chan, & Chan, 2008) and the Sense of Coherence Scale (Antonovsky, 1987) are briefer self-report measures. However, neither focuses on sense-making or coherence with regard to a specific stressor. In particular, the Making Sense of Adversity Scale appears to primarily assess positive and negative cognitions about adversity in general. It has also been argued that the Sense of Coherence Scale may be best conceptualized as a measure of overall satisfaction with life (see Gruszcynska, 2006, for a review).

Finally, Berntsen and Rubin's (2006) Centrality of Event Scale (CES) assesses the extent to which a memory for a stressful life experience has become a central part of one's identity. Consistent with its authors' hypothesis that overidentification with a stressful life event can place one at risk for serious adjustment problems, higher scores on the CES have been shown to be associated with greater psychological distress (Berntsen & Rubin, 2006, 2007). The CES is based on the "landmark perspective" of trauma, which asserts that highly emotional and distinctive events may become problematic if they remain highly salient and serve as a reference point for the organization of other more mundane events (Berntsen, 2001; Neisser, 1982; Rubin & Kozin, 1984). In narrative terms, such a conceptualization fits with the notion of "narrative dominance," in which an individual's sense of self becomes dominated by a "traumatic self" or "posttraumatic identity" (Neimeyer, 2000). Instead of allowing for the consolidation of more positive subsequent emotional experiences, the individual experiences new life experiences as confirming maladaptive beliefs about the unfairness of life, dan-

gerousness of the world, and his or her incompetence to deal with life's challenges.

The proposed new instrument—the Integration of Stressful Life Experiences Scale (ISLES)—has a different focus than the CES and previous measures. The ISLES assesses the degree to which a stressful life experience has been adaptively incorporated into a broader life story that may promote a sense of internal coherence and foster a secure and hopeful view of the future. From a broader perspective, Park's (2010) model of meaning-making draws distinctions between (a) *global meaning* (e.g., an individual's overall views about self, world, and other), (b) the *appraised meaning* of an event (e.g., as a threat, loss, or challenge), (c) *meaning-making processes* or efforts to reduce the discrepancy between the appraised meaning of an event and global meaning (e.g., using positive reappraisal or other forms of meaning-making coping; Folkman, 1997; Park & Folkman, 1997), and (d) the meanings made or *products of meaning-making* processes (e.g., does the event "make sense"?). Viewed in the context of this model, the ISLES addresses the fourth category, providing a measure of outcome resulting from meaning-making processes (i.e., it assesses the extent to which there is or is not a discrepancy between the appraised meaning of an event and global meaning). Given that meaning-making has been conceptualized in terms of dual processes (i.e., assimilation/accommodation, comprehensibility/significance), we attempted to construct items that may gauge the product of both of these processes.

This article describes the development of the ISLES and provides preliminary information about the reliability and validity of ISLES scores in two samples: (a) a "general stress" sample of young adults who experienced a range of stressful life experiences in the previous 2 years and (b) a sample of bereaved young adults who had lost a loved one over the same time period. In both samples, we examined the factor structure, internal consistency, and test–retest reliability of the ISLES. We also examined convergent validity of the ISLES using common measures of situational meaning (i.e., meanings made in the context of a particular event), assumptive worldviews, psychological distress, and general physical health. We hypothesized that greater integration of a stressful life experience (i.e., higher ISLES scores) would be associated with higher scores on previously used single-item measures of sense-making and benefit-finding, more positive worldviews, less psychological distress, less severe grief reactions (in the bereaved sample), and better perceived health. Because the ISLES was specifically developed to gauge adaptive integration (rather than overidentification with a stressful life experience), we also anticipated an inverse association between the ISLES and CES in the two samples.

METHOD

Participants and Procedure

Following institutional review and approval of the project, two samples were recruited from introductory psychology courses at a large southern research university through posted fliers, university-based online notices, and in-person announcements during class by research assistants. We gathered data from a "bereaved sample" of 150 individuals, who had lost a loved one in the previous 2 years, and a "general stress sample" of 178 individuals, who were not recently bereaved but provided data in reference to another stressful life event within the previous 2 years. Sociodemographic characteristics and stressor-related information are presented in Table 1 for both samples. As can T1 be seen in this table, the general stress and bereaved samples were similar in terms of age, sex, and household educational attainment. However, the general stress sample had a higher proportion of Caucasian individuals compared with the bereaved sample.

Participants completed surveys using an online system sponsored by the institution's psychology department. Students were issued a unique username and password, which ensured that each participant completed the survey only once. After giving informed consent, participants provided demographic information, information about their stressor or loss, and also completed a host of relevant measures, including the candidate ISLES items as well as several other measures used to establish convergent validity. In the general stress sample, participants were asked to indicate the one life event that was "most stressful and problematic" for them in the past 2 years and to then respond to a variety of questions related to that experience. Likewise, bereaved participants were instructed to respond with regard to their recent loss. If they had experienced multiple losses in the past 2 years, participants were asked to choose the loss that had the greatest impact on them. As part of the informed consent process, it was emphasized to participants that their participation was strictly voluntary and they could discontinue at any time. For those who chose to complete the study, a response was required for each item in order to proceed to the next page of the online questionnaire. Hence, there were no missing data.

To establish an estimate of test–retest reliability, we asked participants in both samples to complete surveys again approximately 3 months following the initial survey. Forty-one individuals in the general stress sample (who reported on the same stressful life event as before) and 61 participants in the bereaved sample responded to this request and were reassessed. At this follow-up assessment, participants completed the ISLES as well as the other measures used in this study. In both the general stress and bereaved samples,

Table 1. Demographic and Stressor-Related Information for the General Stress and Bereaved Samples

Variable	General stress sample ($n = 178$)	Bereaved sample ($n = 150$)
Age (years)	$M = 21.2, SD = 6.1$	$M = 22.1, SD = 8.0$
Sex	143 Women (80.3%) 35 Men (19.7%)	124 Women (82.7%) 26 Men (17.3%)
Ethnicity	107 Caucasian (60.1%) 55 African American (30.9%) 8 Asian (4.5%) 1 Hispanic/Latino (0.6%) 7 Other (4.0%)	61 Caucasian (40.7%) 67 African American (44.7%) 10 Asian (6.7%) 3 Hispanic/Latino (2.0%) 9 Other (6.0%)
Highest level of education in household	1 Some grade school (0.6%) 3 Attended high school (1.7%) 3 High school equivalency (1.7%) 17 High school graduate (9.6%) 65 Some college/trade school (36.5%) 16 Associate's degree (9.0%) 49 Bachelor's degree (27.5%) 24 Graduate school (13.5%)	2 Some grade school (1.3%) 4 Attended high school (2.7%) 2 High school equivalency (1.3%) 20 High school graduate (13.3%) 58 Some college/trade school (38.7%) 10 Associate's degree (6.7%) 30 Bachelor's degree (20.0%) 24 Graduate school (16.0%)
Type of event/type of loss	Most common stressful life events: 31 Loss of relationship (17.4%) 26 Financial problems (14.6%) 14 Problems at school (7.9%) 13 Increased tension in family (7.3%) 9 Physical illness/injury (self; 5.1%) 9 Mental illness (self; 5.1%) 9 Physical illness/injury (other; 5.1%) 6 Mental illness (other; 3.4%) 5 Substance abuse (self; 2.8%) 5 Problems at work (2.8%)	Relationship to deceased: 26 Immediate family (17.3%) 89 Extended family (59.3%) 35 Friend (23.3%) Cause of death: 60 Natural anticipated (40%) 29 Natural sudden (19.3) 29 Accident (19.3%) 9 Suicide (6.0%) 10 Homicide (6.7%) 13 Other (e.g., perinatal death; 8.7%)

participants who completed the follow-up assessment were not significantly different from the remaining participants in terms of their age, ethnicity, household educational attainment, and mental or physical health. In the general stress sample, a trend was observed for men to be somewhat more likely to complete the follow-up assessment ($\chi = 4.89$, $p = .03$). However, a similar trend was not found in the bereaved sample ($\chi = 0.02$, $p = .88$).

Candidate ISLES Items

Construction of ISLES items was guided by theory about the psychological integration of stressful life experiences. In particular, we aimed to create items that gauged accommodative aspects of integration, which focused primarily on the extent to which one's assumptions, values, or expectations have been altered following a stressful life event (e.g., "My previous goals and hopes for the future don't make sense anymore since this event"). In creating these items, we attempted to represent a range of possible domains that might be influenced by a stressful event, including interpersonal beliefs, spiritual beliefs, and beliefs about the world in general (e.g., as feeling safe or experiencing the world as predictable). We also developed items that assessed the extent to which one has assimilated a stressful life experience into existing meaning structures (e.g., "I have difficulty integrating this event into my understanding of the world").

Although some of the candidate ISLES items were positively worded, such that an affirmative response would indicate greater integration (e.g., "I have made sense of this event"), most items were worded negatively so that an affirmative response would indicate less integration (e.g., "This event is incomprehensible to me"). This preference for negatively worded items was guided by several factors. First, it has been proposed that meaning-making often takes place outside of individuals' awareness, and that these processes may primarily come into awareness when a discrepancy exists between the appraised meaning of a stressor and global meaning (e.g., following an earthquake, an individual can no longer believe the world is generally predictable and safe; Creamer, Burgess, & Pattison, 1992; Janoff-Bulman & Frantz, 1997; Moulds & Bryant, 2004). As a result, we believed that participants would find it easier to report on the extent to which a discrepancy does or does not exist, rather than commenting on their felt sense of "coherence," "integration," or "meaning." Notably, more positively worded measures that have examined growth or benefit-finding after a stressful life event have been shown to have inconsistent associations with measures of psychiatric distress, perhaps because these measures tap into constructive, cognitive processing of a stressor as well as less adaptive processes, such as self-deception or

avoidance (see Zoellner & Maercker, 2006, for a review). In addition, models of meaning-making have proposed that it is the discrepancy between appraised and global meaning that primarily gives rise to distress and psychiatric symptoms, and the achievement of a lack of discrepancy may be described as integration of (or meaning made out of) a stressful life event (Park, 2010; Park & Folkman, 1997). Thus, it made theoretical sense to largely conceptualize integration in terms of a lack of discrepancy between appraised meaning of an event and global meaning (as would be the case for our negatively worded items).

With these theoretical considerations in mind, an initial pool of items was constructed by the first author (J.M.H.), which was then revised, critiqued, and supplemented by the three coauthors. Only items that were unanimously judged as nonredundant, clearly worded, and face valid were retained, leaving a total of 30 items for further evaluation. A 5-point response format was used, with responses ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). In scoring the items for subsequent analyses, items were reverse coded as needed so that a higher score always denoted greater integration (see the Appendix for scoring instructions).

Measures Used in Convergent Validity Analyses

Sense-Making and Benefit-Finding

Sense-making was assessed by the question, "How much sense would you say you have made of this event?" with anchor points of 1 (*I have been able to make no sense of this event*) to 5 (*I have been able to make a great deal of sense of this event*). This item was worded somewhat differently in the bereaved sample: "How much sense would you say you have made of the loss?" Benefit-finding was also assessed with a single question: "Sometimes people who experience a stressful or problematic event find some benefit or positive aspect in the experience. Have you been able to find any benefit from your experience of this event?" As with the one-item sense-making measure, the wording of this item was altered slightly in the bereaved sample by using language that specifically referenced the loss. Responses were rated on a 5-point scale ranging from 1 (*none*) to 5 (*a great deal*). These single-item questions correspond closely to the single-item questions that other researchers have used to measure these two construals of meaning (e.g., Davis et al., 1998; Holland, Currier, & Neimeyer, 2006). Davis and colleagues (1998) found that both of their items showed reasonable test–retest reliability, with Pearson correlations greater than .5 from 6 months to 13 months after the loss of a loved one.

CES

The extent to which bereavement and other distressing events had become a dominant aspect of participants' identity and life stories was assessed by a seven-item brief version of the CES (Berntsen & Rubin, 2006, 2007). Items were rated on a 5-point Likert-type scale, with anchor points of 1 (*totally disagree*) to 5 (*totally agree*), such that higher scores suggest greater centrality of the stressful life event to one's identity. Example items include "I feel that this event has become part of my identity" and "This event has colored the way I think and feel about other experiences." Participants in the general stress sample were asked to respond with regard to the focal stressor identified earlier, whereas bereaved participants were instructed to respond to these items with regard to their recent loss. The brief version of the CES has been shown to have strong internal consistency (α = .88) and criterion validity, with higher scores being associated with more severe depressive and posttraumatic symptomatology (Berntsen & Rubin, 2006). In the present study, the CES displayed excellent internal consistency among those in the general stress and bereaved samples (α = .90 and .93, respectively).

World Assumptions Scale

The World Assumptions Scale (WAS; Janoff-Bulman, 1989) is a widely used 32-item self-report instrument that generates three primary subscales for benevolence, meaningfulness, and self-worth. Items were rated on a 5-point scale, with anchor points of 0 (*strongly disagree*) to 4 (*strongly agree*), such that higher scores indicate stronger beliefs for a particular assumption. Example items for the subscales include "Human nature is basically good" (benevolence); "Generally, people deserve what they get in this world" (meaningfulness); and "I am usually satisfied with the kind of person I am" (self-worth). The WAS has been used extensively in past research, demonstrating good reliability in several studies (e.g., Dekel, Solomon, Elklit, & Ginzburg, 2004; Elklit, Shevlin, Solomon, & Dekel, 2007; Janoff-Bulman, 1989). In support of its construct validity, the WAS has been shown to be associated with posttraumatic stress symptoms (Dekel et al., 2004; Elklit et al., 2007) and to differentiate survivors of a traumatic experience from people who did not report a history of trauma (Janoff-Bulman, 1989; Matthews & Marwit, 2004; Schwartzberg & Janoff-Bulman, 1991). Internal consistencies were favorable for the total WAS in the general stress (α = .84) and bereaved (α = .84) samples, as well as for the three subscales in each sample (general stress α = .72–.82; bereaved α = .77–.78).

SF-36—General Health

We used the General Health subscale of the SF-36 to assess participants' degree of perceived overall health. The SF-36 Health Survey is a well-validated questionnaire with several subscales of physical and mental health (Ware, Kosinski, & Gandek, 2000). The SF-36 scales have been shown to have strong internal consistency in a number of past studies (with alphas generally hovering around .8). Furthermore, predictive studies of validity have linked the SF-36 scales to important outcomes such as use of health care services, depression, loss of employment, and mortality (see Ware, 2004, for a review). The General Health subscale of the SF-36 demonstrated good internal consistency for the two samples in the study (general stress α = .78; bereaved α = .74).

Symptom Checklist-10—Revised

General psychiatric distress over the past 30 days was measured by the Symptom Checklist–10—Revised (SCL-10–R; Rosen et al., 2000). The SCL-10–R is a revised 10-item index of the Symptom Checklist–90 (Derogatis, Lipman, & Covi, 1973). Items on the SCL-10–R assess the intensity of distress associated with a variety of psychiatric symptoms, each of which is rated on a 5-point scale from 0 (*not at all*) to 4 (*extremely*). Example items include "Your feelings being easily hurt" and "Feeling tense or keyed up." The SCL-10–R has been shown to correlate highly with other standardized brief measures of emotional distress (Strand, Dalgard, Tambs, & Rognerud, 2003), supporting its validity as a general measure of psychological functioning. The SCL-10–R displayed good internal consistency in the general stress (α = .81) and bereaved (α = .87) samples.

Inventory of Complicated Grief—Revised

We used the revised version of the Inventory of Complicated Grief (ICG–R; Prigerson & Jacobs, 2001) to assess grief severity among the participants in the bereaved sample. The ICG–R is made-up of 30 items, each of which is phrased as a declarative statement (e.g., "I feel myself longing and yearning for [the deceased]") to which the frequency of symptoms is indicated on a 5-point scale, ranging from 1 (*never*) to 5 (*always*). The symptoms represented by this measure mirror the symptoms included in the proposed diagnostic criteria for prolonged grief disorder (Prigerson, Vanderwerker, & Maciejewski, 2008), a state of chronic grieving characterized by

intense separation distress, intrusive and troubling thoughts about the deceased, a sense of meaninglessness, trouble accepting the reality of the loss, and various difficulties "moving on" with life following the loss. A Dutch version of the ICG–R has displayed high internal consistency ($\alpha = .94$), concurrent validity ($r = .71$) with scores from the Texas Revised Inventory of Grief (Faschingbauer, 1981), and good test–retest reliability ($r = .92$) over a period ranging from 9 to 28 days (Boelen, van den Bout, de Keijser, & Hoijtink, 2003). In addition, the ICG–R has been shown to predict a range of serious long-term physical and mental health consequences of bereavement, justifying its interpretation as a measure of prolonged grief disorder symptomatology (Ott, 2003; Prigerson et al., 1997; Prigerson & Jacobs, 2001). In the present bereaved sample, the ICG–R was found to be internally consistent ($\alpha = .96$).

Plan of Analysis

The general stress sample was used for exploratory analyses of the ISLES, as we were primarily interested in arriving at a model that could be applied to individuals who have experienced a broad range of stressors. We first examined corrected item-total correlations (excluding the item of interest from the total score) and removed items with substantially lower item-total correlations compared with the other items to ensure that each item represented a reasonable measure of the overall construct.

The remaining items were analyzed using principal components analysis with oblique rotation (i.e., direct oblimin) in SPSS 17. Because we wanted items that primarily loaded on one component, only items with loadings ≥.40 on one component and cross-loadings <.20 on all other components were retained. Rather than relying on "rules of thumb" or subjective judgment to arrive at an optimal number of components, we used parallel analysis (Horn, 1965) and Velicer's (1976) minimum average partial (MAP) test to decide how many components to retain. Parallel analysis involves extracting eigenvalues from a series of random data sets (in this case, 1,000) that parallel the actual data in terms of sample size and number of items. Eigenvalues from the actual data are then compared with those derived from the random data, and components in the actual data with eigenvalues greater than the 95th percentile of eigenvalues derived from the random data sets are retained (Glorfeld, 1995). The MAP test involves examining the relative amounts of systematic and unsystematic variance remaining in the correlation matrix for all items after extracting increasing numbers of components and selecting the solution that minimizes the partial correlations among items once variability due to the components is partialed out. These analyses were performed using

macros developed by O'Connor (2000) for SPSS. We also replicated these exploratory analyses using exploratory factor analysis (EFA) in MPlus (Version 4.1; Muthén & Muthén, 2006) to provide additional indices of fit, including the chi-square goodness-of-fit test and the root mean square error of approximation (RMSEA; Browne & Cudeck, 1993).

Once we arrived at an optimal pool of items and factor structure in these exploratory analyses, we used the bereaved sample to perform a confirmatory factor analysis to assess whether this model might generalize to a population of individuals who had experienced a particular stressor of some significance. In evaluating this model, we relied on a variety of fit indices, including a chi-square goodness-of-fit test, the comparative fit index (CFI; Bentler, 1990), the standardized root mean square residual (SRMR), and the RMSEA (Browne & Cudeck, 1993). The chi-square goodness-of-fit test assesses the discrepancy between the observed covariance matrix and the covariance matrix of the fitted model. With large samples, however, the null hypothesis of equivalence will be rejected for virtually any parsimonious model, and with a small sample model misfit may be undetected. Therefore, we relied primarily on the other fit indices. CFI values $>.90$ and SRMR values $<.10$ are generally regarded as favorable (Hu & Bentler, 1999; Kline, 2005). Likewise, RMSEA values $\leq.05$ are considered close approximate fit, values between .05 and .08 suggest reasonable fit, and values $\geq.10$ are indicative of poor model fit (Browne & Cudeck, 1993). Confirmatory factor analysis was performed in MPlus.

Following these analyses, we also examined the reliability and validity of the ISLES in both samples. In particular, we computed Cronbach's alphas for the total scale as well as for each identified subscale established in the factor analyses. Pearson correlations were calculated to determine 3-month test–retest reliability for the subset of participants who provided data at a follow-up assessment. We also examined the correlations between the ISLES and conceptually similar measures, as well as mental and physical health outcomes, to assess convergent validity.

RESULTS

Exploratory Analyses With the General Stress Sample

Corrected item-total correlations with the entire pool of 30 items in the general stress sample revealed a mean item-total correlation of .60 ($SD = .15$). Three items were removed because their item-total correlations were more than 1 standard deviation lower than the mean.

Parallel analysis and Velicer's MAP test using the remaining 27 items in the general stress sample suggested that a two-component solution was

optimal, with an eigenvalue of 12.47 for the first component and an eigenvalue of 1.90 for the second component. We next conducted a principal components analysis with oblique rotation that was constrained to two components using these 27 items. Based on the loadings for each item, we retained Items 1, 3, 5, 7, 9, 11, 12, 13, 14, 15, and 16 for the first component and Items 2, 4, 6, 8, and 10 for the second component, using the criteria described earlier (i.e., loadings $\geq$.40 for one component and $<$.20 for the other). Descriptive statistics, item-total correlations, and the loadings for these 16 items are presented in Table 2.

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Table 2. Descriptive Statistics, Item-Total Correlations, and Pattern Matrix for the General Stress Sample ($n = 178$)

Item	Mean	SD	Corrected item-total correlations	Loading 1	2
1. Since this event, the world seems like a confusing and scary place.	3.84	1.14	.73	.73	.09
2. I have made sense of this event.	3.39	1.13	.48	−.10	.71
3. If or when I talk about this event, I believe people see me differently.	3.31	1.35	.57	.55	.11
4. I have difficulty integrating this event into my understanding of the world.	3.70	1.14	.57	.04	.68
5. Since this event, I feel like I'm in a crisis of faith.	4.04	1.09	.64	.74	−.02
6. This event is incomprehensible to me.	3.62	1.17	.62	−.05	.83
7. My previous goals and hopes for the future don't make sense anymore since this event.	4.02	1.11	.68	.89	−.12
8. I am perplexed by what happened.	3.27	1.18	.59	−.17	.92
9. Since this event happened, I don't know where to go next in my life.	4.03	1.10	.69	.86	−.08
10. I would have an easier time talking about my life if I left this event out.	3.41	1.26	.52	.13	.50
11. My beliefs and values are less clear since this event.	3.97	1.18	.58	.74	−.09
12. I don't understand myself anymore since this event.	4.06	1.06	.80	.74	.15
13. Since this event, I have a harder time feeling like I'm part of something larger than myself.	3.93	1.11	.75	.75	.08
14. This event has made me feel less purposeful.	4.12	1.07	.71	.94	−.16
15. I haven't been able to put the pieces of my life back together since this event.	4.03	1.09	.76	.89	−.05
16. After this event, life seems more random.	3.49	1.25	.55	.47	.17

Note. Corrected item-total correlations are based on the initial pool of 30 items. Likewise, the loadings were derived from a principal components analysis that involved 27 items (with three removed because of low item-total correlations). The 16 items with loadings $\geq$.40 on one component and $<$.20 on the other are presented in this table.

Based on the content of the items, it appeared that the first 11-item component tapped into the extent to which a participant felt oriented or disoriented in the world following a stressful life event (e.g., feeling purposeful or secure). As a result, this component was labeled Footing in the World. The second five-item component seemed to gauge the degree to which one had made sense of or found a way to comprehend a stressful life event. Thus, this second component was labeled Comprehensibility.

Using these same 16 items, a replication of these exploratory analyses was performed in MPlus using EFA with promax rotation, which provided additional indices of fit and also allowed us to account for possible nonnormality in the data. Because there was evidence of significant skew (Mardia's multivariate skew $= 60.52, p < .001$) and kurtosis (Mardia's multivariate kurtosis $= 361.69, p < .001$),[1] parameters were estimated with the maximum **Fn1** likelihood mean adjusted (MLM) procedure. MLM is robust even in the face of substantial nonnormality. This analysis revealed that a two-factor solution ($\chi^2 = 176.19, p < .001$; RMSEA $= .074$) fit the data better than a one-factor solution ($\chi^2 = 303.51, p < .001$; RMSEA $= .104$). In addition, in the two-factor model arrived at in the EFA, a similar pattern of loadings was observed (as was found in the principal components analysis), with the same 11 Footing in the World items loading highly on one factor and the same five Comprehensibility items loading highly on another.

Confirmatory Factor Analysis With the Bereaved Sample

We next aimed to confirm this model in the bereaved sample. Preliminary screening of the data revealed that the ISLES items in this sample were also not normally distributed (Mardia's multivariate skew $= 104.58, p < .001$; Mardia's multivariate kurtosis $= 417.55, p < .001$). Thus, parameters were estimated using the MLM procedure. Consistent with the exploratory model arrived at in the general stress sample, we tested a model with two latent factors—one of which represented a Footing in the World factor, measured with the best 11 items established in the exploratory analyses, and another that represented a Comprehensibility factor, measured with the five best items established previously. This two-factor model is shown in Figure 1 and was found to fit the data reasonably well ($\chi^2 = 183.00, p < .001$; **F1** CFI $= .93$; SRMR $= .076$; RMSEA $= .072$). In contrast, a one-factor model did not fit the data very well in the bereaved sample ($\chi^2 = 260.53, p < .001$; CFI $= .86$; SRMR $= .076$; RMSEA $= .10$).

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[1] Mardia's kurtosis coefficient is not normalized. Thus, it should not be interpreted as a *z* score.
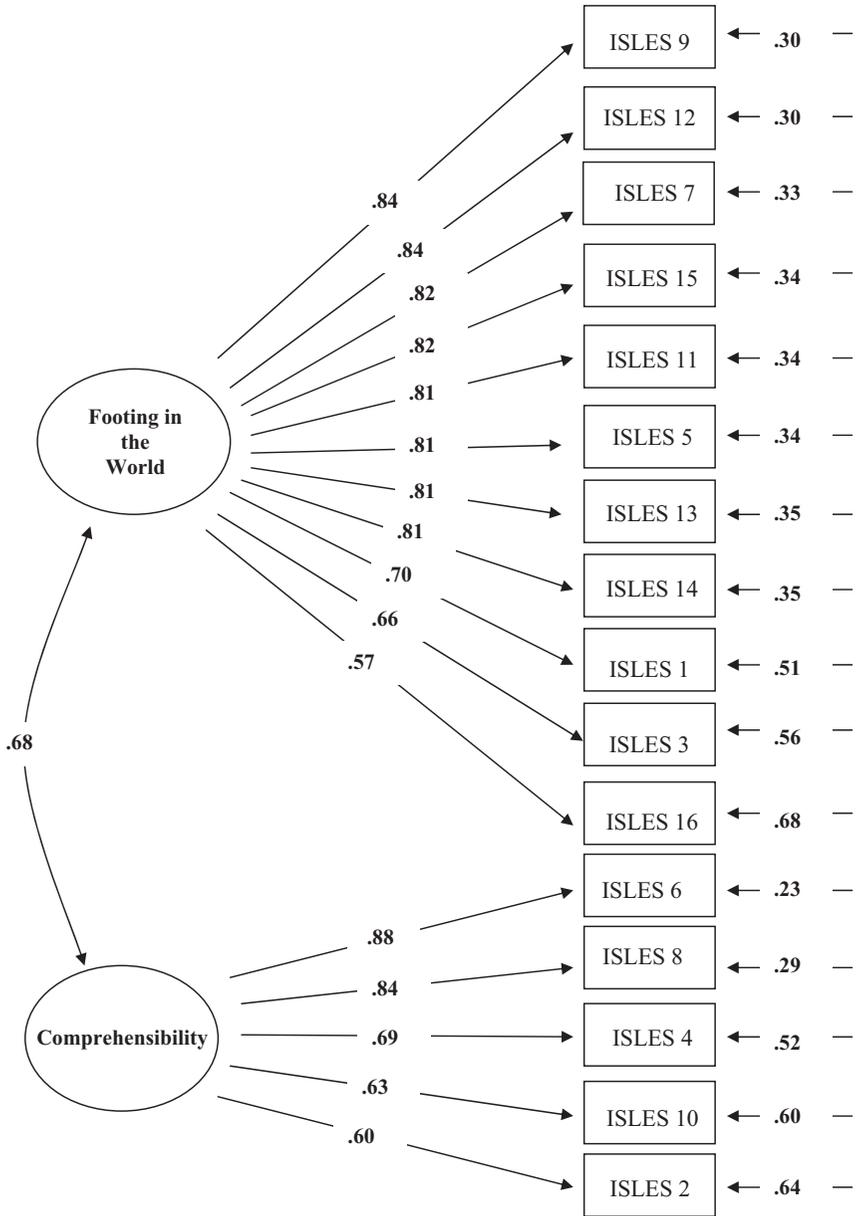
Figure 1. This figure displays results from the confirmatory factor analysis for the two-factor model tested in the bereaved sample ($n = 150$). Standardized estimates are given, and the numbers to the right of each box represent the proportion of unexplained variance for each item.

Convergent Validity in the General Stress and Bereaved Samples

The 11 items measuring footing in the world and the five items measuring comprehensibility were summed to examine the performance of these items as subscales. Correlations between the total ISLES, ISLES subscales, measures of related constructs (e.g., sense-making, benefit-finding), and mental and physical health outcomes are presented in Tables 3 and 4. As can be seen in these tables, the ISLES scores were significantly correlated with the one-item sense-making measure in both the general stress and bereaved samples. It is interesting that these correlations were highest for the Comprehensibility subscale, providing preliminary support for the interpretation of this ISLES subscale as a measure of comprehension of a stressful life event. With regard to the one-item benefit-finding measure, an unexpected pattern emerged. In the general stress sample, both subscales of the ISLES were positively associated with benefit-finding (even more strongly than with sense-making, in fact). However, in the bereaved sample, there appeared to be no consistent relation between the ISLES and benefit-finding.

Consistent with our hypothesis, higher scores on the ISLES were generally associated with more positive world assumptions about benevolence and self-worth (as measured by the WAS) in both samples. Notably, these correlations with world assumptions tended to be highest for the Footing in the World subscale—a pattern that might be expected given the interpretation of this subscale as primarily being a measure of the extent to which one still feels oriented and firmly anchored in the world following a stressful life event. The ISLES was not significantly associated with the Meaningfulness subscale of the WAS in either sample.

The total ISLES and ISLES subscales were also positively associated with perceived general health, as measured by the SF-36, and negatively associated with psychological distress, as measured by the SCL-10–R, in both the general stress and bereaved samples. In addition, the ISLES and its subscales showed a strong negative association with prolonged grief symptoms in the bereaved sample, as measured by the ICG–R. In most cases, the ISLES outperformed other related and commonly used measures (e.g., sense-making, benefit-finding, CES) in terms of the strength of its association with these mental and physical health outcomes.

It is possible that some of the stressors identified by participants in the general stress sample may have been confounded with a few of the outcome measures of interest (e.g., physical illness or injury would likely be associated with poorer general health; Turner & Wheaton, 1997). Thus, we recalculated the correlations between the ISLES, ISLES subscales, and all of the other measures used in the convergent validity analyses after removing the 23 participants who identified mental illness, physical illness/injury, or sub-

T3-T4

Table 3. Bivariate Correlations Between ISLES and Measures of Related Constructs and Mental and Physical Health Outcomes in the General Stress Sample ($n = 178$)

Measure	1	2	3	4	5	6	7	8	9	10	11
1. ISLES—Footing in World	—	.57***	.96***	.12	.21**	−.42***	.21**	.00	.29***	.36***	−.51***
2. ISLES—Comprehensibility		—	.78***	.35***	.44***	−.18*	.09	−.10	.12	.21**	−.28***
3. ISLES total			—	.22**	.32***	−.38***	.19*	−.03	.26***	.35***	−.48***
4. Sense-making				—	.37***	.22**	−.02	−.09	.06	.05	−.03
5. Benefit-finding					—	.22**	.07	.06	.20**	.27***	−.15*
6. Centrality of Event Scale						—	−.10	.05	−.03	−.16*	.30***
7. WAS—Benevolence							—	.24**	.33***	.22**	−.29***
8. WAS—Meaningfulness								—	.29***	.17*	−.04
9. WAS—Self-Worth									—	.38***	−.41***
10. SF-36—General Health										—	−.49
11. Symptom Checklist 10											—

Note. ISLES = Integration of Stressful Life Experiences Scale; WAS = World Assumptions Scale.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4. Bivariate Correlations Between ISLES and Measures of Related Constructs and Mental and Physical Health Outcomes in the Bereaved Sample (n = 150)

Measure	1	2	3	4	5	6	7	8	9	10	11	12
1. ISLES—Footing in World	—	.69***	.97***	.30***	-.05	-.57***	.25**	-.09	.39***	.20*	-.33***	-.75***
2. ISLES—Comprehensibility		—	.85***	.52***	.11	-.48***	.19*	-.08	.23**	.24**	-.33***	-.67***
3. ISLES total			—	.40***	.01	-.58***	.25**	-.09	.36***	.23**	-.36***	-.78***
4. Sense-making				—	.35***	-.22**	.25**	.00	.32***	.19*	-.34***	-.28***
5. Benefit-finding					—	.17*	.16	.13	.18*	.13	.01	.03
6. Centrality of Event Scale						—	-.09	.08	-.11	-.11	.11	.63***
7. WAS—Benevolence							—	.20*	.44***	.17*	-.24**	-.18*
8. WAS—Meaningfulness								—	.34***	.17*	-.07	.10
9. WAS—Self-Worth									—	.43***	-.40***	-.23**
10. SF-36—General Health										—	-.39***	-.18*
11. Symptom Checklist 10											—	.30***
12. ICG–R												—

Note. ISLES = Integration of Stressful Life Experiences Scale; WAS = World Assumptions Scale; ICG–R = Inventory of Complicated Grief—Revised.
* $p < .05.$ ** $p < .01.$ **** $p < .001.$

stance abuse as their target stressor. In this reanalysis, the direction and pattern of statistical significance was unchanged for correlations between the ISLES (as a total score and subscales) and the other measures.

To further examine the utility of distinguishing between the Footing in the World and Comprehensibility subscales, we conducted several unplanned analyses. In the bereaved sample, the two ISLES subscales were compared for participants who lost a loved one by violent means (i.e., accident, suicide, or homicide) and those who lost a loved one because of natural causes. Our past research has indicated that losing a loved one to violent causes is primarily linked with difficulties in comprehending a loss (Currier, Holland, Coleman, & Neimeyer, 2008; Currier, Holland, & Neimeyer, 2006). In keeping with these findings, participants in the bereaved sample who lost a loved one because of violent causes had much lower levels of comprehensibility compared with those who lost a loved one to natural causes, $t(135) = 4.21$, $p < .001$. However, no significant differences were found for those bereaved by violent and natural deaths on the Footing in the World subscale, $t(135) = 1.43$, $p = .16$, indicating that different types of loss/stress might differentially affect these two related types of integration.

We also conducted a similar analysis in the general stress sample comparing the five participants who experienced a stressor that involved violence (i.e., sexual assault, physical assault, witnessing a traumatic event) with the rest of the sample. This analysis also revealed that those who experienced a violent stressor had significantly lower levels of comprehensibility, $t(176) = 2.08$, $p = .04$, but had similar levels of footing in the world, $t(176) = -0.27$, $p = .79$, offering further support to the idea that violent stressors are particularly difficult to comprehend.

Reliability in the General Stress and Bereaved Samples

Good internal consistency was found among the 11 items making up the Footing in the World factor ($\alpha = .93$ and .94 in the general stress and bereaved samples, respectively), the five items making up the Comprehensibility factor ($\alpha = .80$ and .85 in the general stress and bereaved samples, respectively), and among the 16 items making up the total ISLES ($\alpha = .92$ and .94 in the general stress and bereaved samples, respectively).

We also examined test–retest reliability among the subset of participants who provided follow-up data approximately 3 months after the initial assessment. Overall, moderate test–retest correlations were found for the Footing in the World subscale ($r = .57$, $p < .001$, and $r = .59$, $p < .001$, in the general stress and bereaved samples, respectively), the Comprehensibility subscale ($r = .48$, $p < .01$, and $r = .57$, $p < .001$, in the general stress and bereaved

samples, respectively), and the total ISLES ($r = .57$, $p < .001$, and $r = .57$, $p < .001$, in the general stress and bereaved samples, respectively).

Given the ISLES's moderate stability across the 3-month interval, we conducted an unplanned follow-up analysis to see whether the changes in ISLES scores across time reflected changes in other important domains or simply instability in the measure. Specifically, this analysis involved examining the correlations between the change in total ISLES scores from Time 1 to Time 2 (ΔISLES) and the change in mental and physical health measures across this same interval (as measured by ΔSCL-10–R, ΔSF-36-General Health, and ΔICG–R). In each case, Time 2 scores were subtracted from Time 1 scores. Among those who provided retest data in the general stress sample, greater integration over time (ΔISLES) was associated with decreases in psychological distress (as measured by ΔSCL-10–R; $r = -.34$, $p < .05$), and a nonsignificant trend was also found for ΔISLES to be associated with improvements in general health (as measured by ΔSF-36—General Health; $r = .29$, $p = .07$). In the subsample of bereaved participants, no reliable association was found between ΔISLES and ΔSCL-10–R ($r = -.15$, $p = .26$) or ΔSF-36—General Health ($r = .12$, $p = .35$). However, ΔISLES was strongly associated with reductions in prolonged grief symptomatology (as measured by ΔICG–R; $r = -.49$, $p < .001$).

DISCUSSION

These results provide preliminary evidence supporting the reliability and validity of scores from the newly developed ISLES, which attempts to measure the extent to which an individual has adaptively integrated a stressful life experience into his or her broader life narrative (the ISLES and scoring instructions are presented in the Appendix). In particular, in both the general stress and bereaved samples, scores on ISLES items demonstrated good internal consistency and appeared to be moderately stable over a 3-month interval. Furthermore, changes in ISLES scores over time seemed to capture meaningful change in other domains, such as psychiatric distress and complicated grief symptomatology. In general, ISLES scores also showed good convergent validity with similar measures (i.e., the one-item sense-making measure, WAS scores). Higher ISLES scores were also significantly associated with relevant outcomes, such as less psychiatric distress, better general health, and fewer complicated grief symptoms (in the bereaved sample), oftentimes more strongly than for other measures of situational meaning and world assumptions.

As predicted, in both samples the ISLES was also consistently negatively associated with the CES, a measure that gauges the extent to which an

individual regards a stressful life event as being central to his or her identity. The ISLES was also associated with positive outcomes (e.g., better general health, less psychiatric distress), whereas the CES was typically associated with negative outcomes (e.g., more severe prolonged grief symptoms), consistent with past studies of the CES (Berntsen & Rubin, 2006, 2007). These findings suggest that there may be an optimal level at which a difficult "micronarrative" associated with a stressful life event is incorporated into the broader "macronarrative" of one's life (Neimeyer, 2004, 2006), with the CES likely tapping into the overaccommodation of a life stressor and the ISLES capturing the product of more adaptive integrative processes.

However, not all the associations in the convergent validity analyses were in the expected direction. In particular, it was surprising that the ISLES scores were not significantly associated with the one-item benefit-finding measure in the bereaved sample, whereas a significant correlation was observed between these variables in the general stress sample. Notably, a similar pattern was observed for correlations between benefit-finding and measures of adjustment, with benefit-finding not showing significant associations with measures of adjustment in the bereaved sample but showing significant associations with better adjustment in the general stress sample. This pattern of results is subject to a variety of interpretations. However, it is possible that the perception of benefits plays a less adaptive role in the context of a particularly severe and uncontrollable stressor, such as the loss of a loved one. Measures of growth or benefit-finding have generally shown inconsistent associations with measures of distress/adaptation, which may indicate that the perception of growth or benefits reflects both adaptive (e.g., processing and positively reappraising a stressor) and less adaptive (e.g., self-deception/avoidance) ways of coping with a stressful life event (Zoellner & Maercker, 2006). It should be noted, however, that other bereavement studies have found benefit-finding to be associated with more positive outcomes (e.g., Holland et al., 2006). Thus, future studies should explore this issue further, using prospective, longitudinal designs to examine whether the role of benefit-finding differs across various kinds of stressors.

It is notable that we found evidence supporting a two-factor structure of ISLES scores in both the bereaved and general stress samples. These distinct but related factors appeared to tap into the degree to which one felt he or she had some footing in the world following a stressful life event (e.g., "Since this event, I feel like I'm in a crisis of faith") and the comprehensibility of a life stressor (e.g., "I have made sense of this event"). These two dimensions of integration dovetail nicely with past theories suggesting that meaning-making may involve dual processes of comprehending a stressful life event and finding significance in the experience (Janoff-Bulman & Frantz, 1997; Joseph & Linley, 2005).

The findings of this study also provide some preliminary evidence for the possible predictive advantages of looking at these dimensions separately under certain circumstances. For example, the Footing in the World subscale appeared to be more strongly related to individuals' world assumptions, compared with the Comprehensibility subscale. We also found that violent types of losses and stressors posed particular challenges with regard to the comprehensibility of a stressful life event but were not significantly different from other stressors in terms of footing in the world. Given that these violent events often represent acts of volition (and hence involve attributions of responsibility and blame), it seems likely that these stressors may have been particularly difficult for participants to assimilate within their most fundamental beliefs about human nature. Future studies would do well to continue to examine these two ISLES subscales to see how they might be differentially related to various types of stressors (e.g., those appraised as threatening, challenging, or controllable) and outcomes of interest (e.g., trauma symptoms).

Despite the promising results of this initial validation study, some limitations should be noted. First, we relied on two young adult samples, one of which included individuals who experienced a range of stressors (from which the exploratory analyses were derived) and another that included recently bereaved participants (from which the confirmatory analyses were derived). Because our goal was to develop a measure that is broadly applicable across different stressors, it was encouraging to find that the ISLES items behaved similarly in both a sample of those who had experienced a range of stressor types and a sample who shared a specific stressor in common. On the other hand, it would be ideal to further investigate the stability of this factor structure with populations who have experienced other specific stressors, such as combat veterans, victims of violent and nonviolent crime, and persons with chronic medical conditions. Similarly, it will be important to validate the ISLES with samples that vary by age and socio-economic status, in addition to the young adult sample used in this initial study.

As integration is conceptualized as the outcome of processes that take place gradually over time, further work using this measure should use longitudinal designs that enable the empirical delineation of this dynamic process. In this study, increases in ISLES scores were associated with decreased distress in the general stress sample and decreased prolonged grief symptoms in the bereaved sample over 3 months. However, this is a relatively short period of time, and the samples that were retested were too small for further analyses. With additional data, it could prove both theoretically and clinically informative to examine whether stressors that occur at a single point in time (such as sudden bereavement or violent assault) follow a different process of integration than those that are extended over time (such

as caregiving or a history of recurrent sexual or physical abuse). Changes in the ISLES should also be studied in relation to additional outcomes, including posttraumatic stress, depression, and generalized anxiety. Measures of coping processes, including those that assess individual coping styles, the specific content of ruminative thinking following a stressful event, and types of "sense" or "benefits" generated should also be linked to the ISLES. These data could help foster better understanding of how changes in integration over time overlap with the content or valence of changes observed in personal narratives.

Despite the strong associations observed between the ISLES and outcomes of interest (e.g., reduced psychiatric distress, improved perceived health), the cross-sectional nature of these analyses prohibits causal claims from being made. Experimental, longitudinal designs would allow for testing models that hypothesize that successful integration may play a causal role in positive outcomes following stress. To the extent that fuller integration of stressful life experiences is predictive of better mental or physical health outcomes, controlled studies of narrative and meaning-making interventions designed to promote such integration (e.g., Neimeyer, van Dyke, & Pennebaker, 2009) would contribute to theoretically grounded, evidence-based practice for a range of problems.

Finally, previous authors have emphasized that meaning-making does not take place in an interpersonal vacuum, but rather is a socially mediated phenomenon (Nadeau, 1997; Neimeyer, 2002). A number of the items initially created for the ISLES were intended to address this aspect of integration (e.g., "If or when I talk about this event, I believe people see me differently"). Although the EFA performed here did not yield a distinct factor that exclusively included this content, it may be worthwhile to develop additional items on this theme, perhaps as a separate measure—an area for further development and research.

Notwithstanding these limitations, the present study provides encouraging information on a brief, easy-to-use measure of adaptive integration of a stressful life event. Provided that future studies are able to further support the reliability and validity of this measure, the ISLES has the potential to advance research on personal meaning and could also serve as an important assessment tool in clinical practice. From a research standpoint, unlike qualitative measures (e.g., the Assimilation of Problematic Experiences Scale; Stiles & Angus, 2001), the ISLES can be quickly administered and scored, making it ideal for large-sample, longitudinal research—the very designs that are necessary to begin evaluating theories that view integration or meaning-making as a causal factor that predicts adjustment following a stressful life event. This new measure also has promise as a clinical assessment tool that might help therapists identify clients who are at risk for adverse mental and physical health outcomes over the short and long term.

The ISLES may further help pinpoint areas in which clients might be struggling (e.g., feeling less purposeful, feeling that one's faith has been shattered), which could inform a therapist's selection of interventions.

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Appendix
ISLES Items and Scoring Instructions

Please indicate the extent to which you agree or disagree with the following statements with regard to (the most stressful life event you experienced in the past two years). Read each statement carefully and be aware that a response of agreement or disagreement may not have the same meaning across all items.

Item	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1. Since this event, the world seems like a confusing and scary place.	1	2	3	4	5
2. I have made sense of this event.	1	2	3	4	5
3. If or when I talk about this event, I believe people see me differently.	1	2	3	4	5
4. I have difficulty integrating this event into my understanding about the world.	1	2	3	4	5
5. Since this event, I feel like I'm in a crisis of faith.	1	2	3	4	5
6. This event is incomprehensible to me.	1	2	3	4	5
7. My previous goals and hopes for the future don't make sense anymore since this event.	1	2	3	4	5
8. I am perplexed by what happened.	1	2	3	4	5
9. Since this event happened, I don't know where to go next in my life.	1	2	3	4	5
10. I would have an easier time talking about my life if I left this event out.	1	2	3	4	5

(*table continues*)

(*Appendix continues*)

Table (*continued*)

Item	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
11. My beliefs and values are less clear since this event.	1	2	3	4	5
12. I don't understand myself anymore since this event.	1	2	3	4	5
13. Since this event, I have a harder time feeling like I'm part of something larger than myself.	1	2	3	4	5
14. This event has made me feel less purposeful.	1	2	3	4	5
15. I haven't been able to put the pieces of my life back together since this event.	1	2	3	4	5
16. After this event, life seems more random.	1	2	3	4	5

Note. With the exception of Item 2 (which should be reverse scored), all items should be scored using the 1 (*strongly agree*) to 5 (*strongly disagree*) format presented above. A sum of all items can be taken to compute a total ISLES score. Likewise, Items 1, 3, 5, 7, 9, 11, 12, 13, 14, 15, and 16 can be summed to compute the Footing in the World subscale, and Items 2, 4, 6, 8, and 10 can be summed to compute the Comprehensibility subscale. The portion of the instructions in parentheses may be altered to make the measure applicable to different groups of interest.