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THE SUICIDAL BEHAVIORS QUESTIONNAIRE-REVISED (SBQ-R): VALIDATION WITH CLINICAL AND NONCLINICAL SAMPLES

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Past suicidal behaviors including ideation and attempts have been identified as significant risk factors for subsequent suicidal behavior. However, inadequate attention has been given to the development or validation of measures of past suicidal behavior. The present study examined the reliability and validity of a brief self-report measure of past suicidal behavior, the Suicidal Behaviors Questionnaire-Revised (SBQ-R). Participants included psychiatric inpatient adolescents, high school students, psychiatric inpatient adults, and undergraduates. Logistic regression analyses provided empirical support for the usefulness of the SBQ-R as a risk measure of suicide to differentiate between suicide-risk and nonsuicidal study participants. Receiver operating characteristic (ROC) analyses indicated that the most useful cutoff scores on the SBQ-R were 7 for nonsuicidal samples, and 8 for clinical samples. Both the single SBQ-R Item 1 and SBQ-R total scores are recommended for use in clinical and nonclinical settings.

Keywords: Suicidal Behaviors Questionnaire, reliability, validity

Over the past decade, several reliable and valid self-report instruments have been developed and validated to tap a range of risk factors in suicidal behavior. For example, the Suicide Probability Scale (SPS; Cull & Gill, 1982), a 36-item self-report instrument, was developed to measure the probability of suicidal behavior. The Beck Scale for Suicide Ideation (BSSI; Beck & Steer, 1991) is a 21-item self-report measure that is used widely to assess the severity of suicidal ideation in adolescents and adults. The Beck Hopelessness Scale (BHS; Beck, Weissman, Lester, & Trexler, 1974), a 20-item self-report instrument, has also frequently been used across adolescent and adult populations to tap into symptoms of hopelessness about future events. Recently, the Reasons for Living Inventory for Young Adults (RFL-YA; Gutierrez et al., in press; Osman, 1998), a 32-item self-report instrument, has been designed to evaluate adaptive reasons for wanting to live as an alternative to killing oneself. To date, however, researchers have given little attention to the development and validation of brief self-report instruments for assessing severe past suicidal thoughts and attempts, although the suicide literature consistently identifies these as important risk factors for subsequent suicidal behavior (see Rudd, 1989; Lewinsohn, Rohde, & Seeley, 1996). A benefit of brief self-report suicide instruments, beyond the ease of administration, cost, and scoring, is the ability to obtain sensitive

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information from individuals who may have difficulty revealing suicidal thought or history in an extended interview situation (Kaplan et al., 1994; Range & Knott, 1997).

In 1981, Linehan developed a 34-item self-report survey, the Suicidal Behaviors Questionnaire (SBQ), for assessing the frequency and severity of suicidal behaviors and past history of suicide attempts. In addition to the initial validation of the original 34-item SBQ (Linehan & Addis, 1983), Linehan and colleagues also have developed a 4-item version (e.g., Linehan & Nielsen, 1981; Linehan, Goodstein, Nielsen, & Chiles, 1983) and a 14-item version of this instrument (Linehan, 1996). To date, there are several different versions of the 4-item SBQ in the suicide literature. For example, Cole (1989) modified the original four items for use with juvenile delinquents in a correctional facility. Recently Cotton, Peters, and Range (1995) have evaluated the reliability and validity of Cole's (1989) version of the SBQ with treatment-seeking women outpatients and college undergraduates. Indeed, the use of the SBQ is becoming more widespread in the suicide literature with no consensus on a well-validated version for use with adolescents and adults in clinical and nonclinical settings (e.g., see Cole, 1988; Gutierrez, Osman, Kopper, Barrios, & Bagge, 2000; Osman et al., 1996).

The increasing number of modified versions of the SBQ in the suicide assessment literature raises the need for a systematic study of the psychometric properties of the SBQ with adolescents and adults. A second concern relates to the lack of validity data for cutoff scores for a brief, validated version of the SBQ, given that several investigations have used the single item SBQ-Item 1 ("Have you ever thought about or attempted to kill yourself?") score to assign research participants to suicide-risk groups. The present study extends previous research with the SBQ by providing initial validational information for a modified version of the SBQ, the SBQ-R (see Appendix). To enhance the generalizability of the findings, we included participants from clinical and nonclinical settings.

There were three major aims of this study. First, we examined the initial responses of clinical and nonclinical adolescents and adults on the SBQ-R by reporting the means and standard deviations of the study participants. Second, we evaluated the extent to which the SBQ-R total score is useful as a risk measure of suicide in differentiating between individuals with suicide-related behavior and nonsuicidal controls. We included responses on the BHS (Beck et al., 1974) in this validational process because scores on this scale have been consistently identified as a significant risk factor for subsequent suicide attempts (Beck, Brown, Steer, Dahlsgaard, & Grisham, 1999; Sidley, Calam, Wells, Hughes, & Whitaker, 1999). Third, we evaluated further potential cutoff scores for the SBQ-R Item 1 (past history of suicide attempts) and total scores that might be useful to researchers in differentiating between individuals with different levels of self-reported suicide-related behaviors.

Method

Participants

Participants were recruited from an adult psychiatric inpatient unit, an adolescent psychiatric inpatient unit, a high school affiliated with a midwestern university, and a medium-sized midwestern university. Brief descriptions of the participants and settings follow.

The psychiatric adolescent inpatient sample was composed of 65 boys (M age = 15.63 years, SD = 0.98) and 55 girls (M age = 15.56 years, SD = 0.98), ranging in age from 14 to 17 years. There was no significant difference between boys and girls in age. The sample consisted of 80% Caucasians, 5% African Americans, 9.2% Asian Americans, 2.5% Hispanic Americans, and 3.3% other ethnic groups. All participants were consecutive admissions to an adolescent unit of a state psychiatric hospital. Diagnoses for each participant were derived by semi-structured psychiatric interview, objective psychological testing, and review of the patient's social history by the unit multidisciplinary assessment and treatment team. In terms of the team-derived diagnoses, 33.3% were diagnosed with conduct disorder, 30.0% with major depressive disorder, 17.5% with oppositional defiant disorder, and 11.20% with other psychiatric and behavioral disorders. All assigned diagnoses were based on criteria of the *Diagnostic and Statistical*

Manual of Mental Disorders (4th ed.; *DSM-IV*, American Psychiatric Association, 1994). For purposes of this study, adolescents who were admitted to the hospital because of recent suicidal attempts or serious suicidal threats were initially assigned to the suicide-risk (suicidal) subgroup (n = 53); adolescents who were admitted for reasons other than suicidal behavior were assigned to the psychiatric adolescent nonsuicidal subgroup (n = 67).

The high school adolescent participants were recruited from a university-affiliated high school in the midwest. The analyses included 72 boys (M age = 16.51 years, SD = 1.33) and 66 girls (M age = 16.47 years, SD = 1.14) ranging in age from 14 to 18 years. No significant difference was found for age between boys and girls. The study sample was composed of 87% Caucasians, 2.9% African Americans, 5.8% Asian Americans, and 4.3% Hispanic Americans. Based on responses from the background information questionnaire, 18 participants who reported past suicidal ideation or attempt were assigned to the suicide-risk (suicidal) subgroup.

The psychiatric adult inpatient sample consisted of consecutive admissions to a state psychiatric hospital. There were 65 men (M age = 32.14 years, SD = 7.43) and 55 women (M age = 33.47 years, SD = 8.79). There was no significant difference between the men and women in age. Of the 120 participants, 80% were Caucasian, 5% were African American, 8.3% were Asian American, 2.5% were Hispanic American, and 4.2% were members of other ethnic groups. As with the psychiatric adolescent inpatient sample, diagnoses for the psychiatric adult inpatient participants were based on semistructured psychiatric interviews, objective psychological testing, and review of each patient's social history by the multidisciplinary assessment and treatment team. We reviewed the medical charts and found that approximately 32.5% were diagnosed with schizophrenia, 16.7% with major depressive disorder, 13.3% with adjustment disorder, and 37.5% with other psychiatric diagnoses (e.g., substance-use and bipolar disorders). As with the adolescent inpatients, all assigned diagnoses were based on criteria of the *DSM-IV*. Analyses of marital status showed that 4.2% were married, 28.3% divorced, 4.2% separated, 5.8% widowed, and 57.5% single or never married. Participants with recent history of suicidal attempts or serious threats at the time of admission were initially assigned to the suicide-risk (suicidal) subgroup (n = 51); participants who did not have history of suicidal ideation or attempt at the time of admission were assigned to the adult psychiatric nonsuicidal subgroup (n = 69).

The undergraduate sample was composed of 135 students recruited from psychology courses at a midwestern state university. There were 69 men (M age = 21.19 years, SD = 2.98) and 66 women (M age = 20.97 years, SD = 2.91). The men and women did not differ significantly in age. Approximately 94% of the participants were Caucasian, 3% African American, and 3% Asian American. The sample was composed of freshmen (14.8%), sophomores (28.9%), juniors (23.7%), seniors (31.1%), and senior plus years (1.5%) in college. The majority of participants were single (97%); 3% were married. Based on responses to the background information questionnaire, 15 (11.1%) students indicated serious past suicidal ideation or behaviors and were assigned to the suicide risk (suicidal) subgroup.

Measures

The questionnaire packets included a background information questionnaire and two other self-report measures.

The background questionnaire (available on request) contained four demographic (age, gender, ethnicity, and highest grade completed) and seven suicide screening items frequently used in our research laboratory. Five of the screening items (e.g., "In the past 6 months, I have seriously considered or attempted to kill myself because of frequent problems in my relationships with people close to me") are answered "true" or "false." One positively-worded item (Item 5) is reverse scored. Two open-ended items are designed to obtain information on the intent to die, and specific method(s) of the most recent serious suicidal ideation or attempt. As a screening instrument for suicidal ideation and attempts, each item taps a risk factor that has been shown to be related directly or indirectly to suicidal behavior: depressed affect (Item 1), life stress (Item 2), hopelessness (Item 3),

interpersonal conflict (Item 4), and satisfaction with most recent life events (reverse scored, Item 5). These items are designed to identify individuals who report "true" on one or more (after scoring) items to be potential cases of at-risk suicidal behavior. Items are summed to obtain a total score; the maximum score is 5.

Preliminary analyses of these screening items have provided adequate reliability and validity data. For example, the internal consistency reliability (α = .97) estimates of the five scored items assessed in an undergraduate sample (n = 275) have been shown to be high. An exploratory principal-components with varimax analysis resulted in a one-factor solution (89.5% of the total variance). Convergent validity evidence was established in that scores on the total items correlated moderately and significantly with the six Adult Suicidal Ideation Questionnaire (ASIQ; Reynolds, 1991) critical items, r = .40, p < .01.[1] In an inpatient adolescent sample, initial evidence for criterion-related validity of these items was established in that a score of 1 or higher on the total screening items differentiated between the nonsuicidal (n = 93) and the suicide attempter (n = 44) groups with high sensitivity (100%) and specificity (100%). In the comparison involving the serious planner/ideator and attempter groups, a score of 4 had a sensitivity of 81.8% and a specificity of 62.8%. In the combined adolescent inpatient sample, the total screening score had a high alpha estimate of .94; the total score also correlated moderately and significantly with the Suicide Probability Scale (SPS; Cull & Gill, 1982) total score, r = .65, p < .01.[2]

The Suicidal Behaviors Questionnaire-Revised (SBQ-R) is made up of four items, each tapping a different dimension of suicidality. SBQ-R Item 1 taps into lifetime suicide ideation and suicide attempt; Item 2 assesses the frequency of suicidal ideation over the past twelve months; Item 3 taps into the threat of suicidal behavior; and Item 4 evaluates self-reported likelihood of suicidal behavior. The SBQ-R items are given in the Appendix. To save journal space, we have not provided an extensive comparison of this version of the SBQ with the many other four-item versions in the suicide literature. Briefly, to be consistent with existing 4-item versions, the original questions were retained in the SBQ-R. However, changes were made in the response formats of several items. We evaluated the SBQ-R total and item scores separately. The single-item validation approach adopted in this study is consistent with the manner in which the SBQ has been used in the suicide literature (e.g., Cole, 1989; Linehan et al., 1983; Osman et al., 1996).

The Beck Hopelessness Scale (BHS; Beck et al., 1974) is a 20-item, true-or-false, self-report scale designed to assess negative expectancies about future events (hopelessness). The BHS has been used widely in both clinic and nonclinic settings; it is appropriate for use with adolescent and adult populations (Beck et al., 1999; Cannon et al., 1999).

Procedure

Questionnaire administration in the university and high school settings were carried out by trained advanced undergraduate research assistants. For the high school participants, we obtained assent only from students who returned the signed parental or legal guardian consent forms. For the undergraduates, written informed consent was obtained before questionnaire administration. The background information questionnaire and the study measures were completed in a single session during regular school hours. Based on the approved research protocols by the University Review Board (IRB) and high school administration, questionnaire administrations were followed by debriefing sessions and making appropriate referrals.

The research protocols for the psychiatric inpatient samples were approved by both the University IRB and the hospital's Treatment and Research Review

[1]These analyses are based in part on a preliminary study designed to develop a suicide-related self-report instrument. The final version of the related manuscript is in press at the *Journal of Clinical Psychology*.

[2]These findings are based in part on a study designed to validate the Multi-Attitude Suicide Tendency Scale (MAST) in psychiatric adolescent inpatient samples. The related manuscript is in press at *Suicide and Life-Threatening Behavior*.

Board. Because the psychiatric hospital generally obtains parental or legal guardian permission for treatment and research participation for children and adolescents during the admission process, we included a description of the study and parental or guardian informed consent forms with the intake assessment packets. Participant assent, however, was obtained on the adolescent unit immediately before questionnaire administration by the clinical staff, the psychology consultant of the hospital (first author) or a graduate student. For the adult inpatients, written informed consent was obtained prior to questionnaire administration on the inpatient unit. The psychology consultant provided training to all the clinical staff prior to the implementation of this project. Data were collected within 1 week of admission to the unit to minimize the effects of long-term hospitalization or treatment.

Suicide-Risk (Suicidal) Status

Suicide-risk (suicidal) status was defined as self-reported suicide ideation or suicide attempts (see O'Carroll et al., 1996). For the nonclinical samples to be included in the suicide-risk (suicidal) subgroup, participants had to obtain a score of 1 or higher on the background screening items. Support for the extensive reliance on self-report of suicide-related behaviors for *research purposes* comes from the findings of *substantial discrepancies* noted between self- and significant other-reports for internalizing symptoms such as depression and recent suicide ideation and attempts. Individuals with internalizing symptoms (e.g., suicide) consistently report more accurate and higher rates of these symptoms than significant others (see Joiner, Rudd, & Rajab, 1999; Kaplan et al., 1994; Shain, Naylor, & Alessi, 1990). In addition, findings from other investigations have provided strong evidence for the high quality of self-report data for research and clinical purposes (e.g., Shain et al., 1990). Furthermore, we note that the frequent assumptions regarding low base rates for suicide-related behaviors in nonclinical samples consistently ignore research findings and clinical observations that many of these behaviors (e.g., serious ideation) are never brought to the attention of health care professionals (e.g., Brener, Hassan, & Barrios, 1999; Simon & Crosby, 2000). Currently, it is safe to conclude that little empirical evidence has been offered to support the assumption of low base rates for a range of suicidal behaviors (e.g., suicide ideation) in most nonclinical populations.

For the psychiatric adolescent and adult inpatient samples, potential participants who were admitted to the hospital because of recent suicidal attempts or serious suicidal threats were initially assigned to the suicide-risk (suicidal) subgroup; those who were admitted for reasons other than suicide-related behaviors were assigned to the psychiatric nonsuicidal subgroup. For adequate accountability and clinical management of patients with at-risk (e.g., suicidal) behaviors, hospital policy requires the assessment team to make comprehensive documentation in the patient's medical chart all the circumstances regarding the at-risk or self-harm behaviors including severity and extent of the injury. Consistent with the approved research protocol, we reviewed these reports in the medical charts of the potential participants. It is important to note that in the adolescent and adult inpatient samples, all the participants in the suicidal subgroups had computed scores of 1 or higher on the background screening items for retention in the suicidal group. Overall, although different strategies were used initially to assign participants into the subgroups, in all groups, the subgroups were formed based on self-report of suicidal histories on the screening questionnaire.

Analyses of demographic characteristics showed that for the psychiatric inpatient adolescents, there was a significant difference between the suicidal and nonsuicidal subgroups for ethnicity, χ^2 (1, N = 120) = 4.09, p = .04; there were more Caucasians in the suicidal subgroup than the nonsuicidal group. For the high school group, the suicidal and nonsuicidal subgroups did not differ significantly in age, ethnicity, or gender. For the psychiatric inpatient adults, the subgroups did differ in age, $t(118)$ = 2.09, $p < .05$; the suicidal adults were significantly older than the nonsuicidal adults. For the university students, suicidal and nonsuicidal subgroup, differences were obtained in demographic variable of gender, χ^2 (1, N = 135) = 4.04, p = .05; the suicidal subgroup had the highest percentage of women.

Results

Relation of the SBQ-R to Demographic Variables

We conducted *t* tests and correlational analyses to examine relations between scores on the SBQ-R and demographic variables of age, ethnicity (Caucasian vs. Other ethnic groups), and gender in the separate groups. For the separate adolescent group, the SBQ-R total scores were not significantly related to age. However, the SBQ-R total scores were correlated significantly with age for the psychiatric inpatient adult ($r = -.18$, $p < .02$) and the undergraduate ($r = .18$, $p < .03$) groups. The results of the *t* tests showed that for the adolescent inpatient group, Caucasians had higher SBQ-R scores than other ethnic groups, $t(118) = 2.15$, $p < .034$. In the separate high school, adult inpatient, and undergraduate groups, there were no differences between Caucasians and other ethnic groups in the SBQ-R total scores. *T*-test analyses also showed no significant differences between men and women in the separate adult inpatient and undergraduate samples on the SBQ-R total scores. There were, however, significant differences between (a) boys ($M = 4.42$, $SD = 2.32$) and girls ($M = 5.45$, $SD = 3.67$), $t(136) = 2.00$, $p < .05$ in the high school sample, and (b) boys ($M = 7.66$, $SD = 4.18$) and girls ($M = 9.60$, $SD = 4.45$), $t(118) = 2.44$, $p < .02$ in the adolescent inpatient sample on the SBQ-R total score.

Suicide-Risk Subgroup Differences on the SBQ-R

The means and standard deviations on the SBQ-R total and items for the two adolescent groups are presented in Table 1. For the psychiatric adolescent inpatient group, a one-way multivariate analysis of covariance (MANCOVA), controlling for ethnicity, showed a statistically significant difference between the suicidal and nonsuicidal subgroups, Hotelling's $T^2 = 3.09$, $F(4, 110) = 88.17$, $p < .001$. Follow-up analyses of covariance (ANCOVAs) showed that the suicidal subgroup scored significantly higher than the nonsuicidal psychiatric adolescent inpatient subgroup on all four SBQ-R items (.05/4; all ps $< .01$). Results of the ANCOVA showed that the suicidal subgroup also obtained a significantly higher score on the SBQ-R total score than the nonsuicidal subgroup, $F(117) = 187.32$, $p < .001$. We obtained similar results in the comparisons involving the high school suicidal and nonsuicidal subgroups (all ps $< .01$), using the MANOVA and follow-up ANOVA procedures. In terms of effect size estimates (independent of the study sample sizes), these differences are all considered large.

Table 2 presents the means and standard deviations on the SBQ-R total and items for the two adult groups. For the psychiatric adult inpatient group, the MANCOVA (controlling for age) also

Table 1
SBQ-R Means, Standard Deviations, and Effect Size Estimates for the Separate Adolescent Samples

	High school sample					Adolescent inpatient sample				
	Suicidal[a]		Nonsuicidal[b]		Effect	Suicidal[c]		Nonsuicidal[d]		Effect
	M	*SD*	*M*	*SD*	size	*M*	*SD*	*M*	*SD*	size
1. Past Attempts	3.44	0.51	1.26	0.44	4.85	3.64	0.48	1.66	0.62	3.52
2. Frequency	3.22	1.52	1.25	0.52	2.72	3.34	1.19	1.52	0.68	1.94
3. Threat	2.11	0.83	1.03	0.18	3.19	2.42	0.69	1.45	0.56	1.56
4. Likelihood	2.56	1.46	0.41	0.78	2.41	3.06	1.52	0.84	1.16	1.67
5. Total SBQ-R	11.33	3.27	3.95	1.48	4.09	12.45	3.02	5.46	2.41	2.59

Note. SBQ-R = Suicidal Behaviors Questionnaire–Revised.
[a] $n = 18$. [b] $n = 120$. [c] $n = 53$. [d] $n = 67$.

Table 2
SBQ-R Means, Standard Deviations, and Effect Size Estimates for the Separate Adult Samples

	Undergraduate sample					Adult inpatient sample				
	Suicidal[a]		Nonsuicidal[b]		Effect	Suicidal[c]		Nonsuicidal[d]		Effect
	M	*SD*	*M*	*SD*	size	*M*	*SD*	*M*	*SD*	size
1. Past Attempts	3.40	0.51	1.45	0.50	3.89	3.25	0.87	1.62	0.55	2.32
2. Frequency	2.27	1.03	1.24	0.50	1.78	3.20	1.41	1.52	0.70	1.58
3. Threat	2.13	1.13	1.16	0.43	1.77	2.12	0.82	1.20	0.44	1.46
4. Likelihood	1.47	0.74	1.15	0.40	0.71	2.61	1.78	0.84	1.11	1.24
5. Total SBQ-R	9.27	1.91	5.01	1.37	2.97	11.18	3.99	5.19	2.20	1.94

Note. SBQ-R = Suicidal Behaviors Questionnaire-Revised.
[a]n = 15. [b]n = 120. [c]n = 51. [d]n = 69.

showed a statistically significant difference between the suicidal and nonsuicidal subgroups, Hotelling's T^2 = 1.34, $F(4, 114)$ = 38.29, $p < .001$. The related follow-up ANCOVAs showed that the adult suicidal inpatient subgroup obtained significantly higher scores than the adult nonsuicidal subgroup on all four SBQ-R items (all $ps < .01$). Likewise, results of the ANCOVA showed that the adult suicidal inpatient subgroup obtained statistically significant scores on the total SBQ-R than the adult nonsuicidal inpatient subgroup. We also obtained similar results in the analyses involving the undergraduate suicidal and nonsuicidal subgroups (all $ps < .01$). That is, controlling statistically for the effects of gender did not change any of the significant subgroup differences. All the subgroup differences on the SBQ-R are large except one.

Intercorrelations and Internal Consistency Reliability Estimates

The intercorrelations among the SBQ-R items in the psychiatric adolescent inpatient sample ranged from .62 (likelihood vs. threat) to .70 (past attempts vs. frequency); the coefficient alpha estimate was moderately high, .88. The intercorrelations among the items in the high school sample ranged from .48 (likelihood vs. threat) to .82 (past attempts vs. frequency); coefficient alpha estimate was also moderately high, .87. Similarly, for the psychiatric adult inpatient sample, the intercorrelations among the SBQ-R items ranged from .62 (likelihood vs. threat) to .76 (past attempts vs. frequency); the coefficient alpha estimate was moderately high, .87. In the undergraduate sample, the intercorrelations among the items ranged from .22 (threats vs. likelihood) to .58 (past attempts vs. frequency); the coefficient alpha estimate was adequate, .76.

Logistic Regression Analyses

We examined the combined clinical utility of scores on the BHS and SBQ-R in differentiating between groups of psychiatric inpatients who had not seriously considered or attempted suicide before admission (nonsuicidal, coded = 0) from those who had seriously considered or attempted suicide (suicidal, coded = 1). Two separate logistic regression analyses were conducted for the inpatient adolescents and adults, using the BHS and SBQ-R total scores as predictors.

In the psychiatric adolescent inpatient group, only the SBQ-R total score was useful in differentiating between the suicidal and nonsuicidal subgroups after controlling for ethnicity, standardized estimate = .79, SE = .15, $p < .001$ (Odds Ratio = 2.19; 95% CI = 1.65, 2.92). In the analysis with the psychiatric adult inpatient group in which we controlled for the effect of age, scores on both the BHS (standardized estimate = .45, SE = .11, $p < .001$;

Odds Ratio = 1.56; 95% CI = 1.27, 1.92) and the SBQ-R (standardized estimate = .39, SE = .11, $p < .001$; Odds Ratio = 1.47; 95% CI = 1.19, 1.82) were useful, as risk factors, in differentiating between the subgroups.

Cutoff Scores for the SBQ-R Item 1 and Total Score

Receiver operating characteristic (ROC) analysis was used to determine potential cutoff scores for the SBQ-R Item 1 and SBQ-R total scores that might be useful in differentiating between individuals with suicide-risk status (suicidal) from nonsuicidal groups (criterion-related validity). Mossman (1994) has recommended the use of this procedure because, unlike other traditional analytic procedures such as discriminant analyses, it is *not* substantially affected by the base rate of a criterion variable (e.g., suicide-risk) in the study samples. To date, this procedure is increasingly being utilized in the assessment literature to compare the responses of diverse clinical and nonclinical samples (e.g., Engelhart, Eisenstein, & Meininger, 1994; Morey & Lanier, 1998; Nicholson et al., 1997). The analyses reported here, however, were restricted to each sample with potentially similar base rates for suicide-related behaviors.

As we noted previously, several researchers have used only SBQ Item 1 (past suicide attempts) to assign individuals into dichotomous groups for analyses: suicidal and nonsuicidal control groups. Typically, individuals who score 1 (never) or 2 (brief passing thought) are assigned to a normal control group; those who endorse a rating of 3 (I have had a plan) or 4 (I have attempted suicide) are assigned to the suicide-risk group. To date, only one study has used total scores on the present version of the SBQ to assign study participants to suicide or control subgroups (Gutierrez et al., 2000).

Results of the ROC analyses involving the SBQ Item 1 are presented in Table 3. In the adolescent inpatient (AUC = .99, *SE* = .012), adult inpatient (AUC = .92, *SE* = .029), adolescent high school (AUC = 1.00, *SE* = .00), and undergraduate college (AUC = 1.00, *SE* = .00) samples, a cutoff score of 2 was most useful in suggesting that (a) individuals with established suicide-status were correctly identified as positive for suicide ideation or attempts (sensitivity), and (b) individuals identified as nonsuicidal were correctly identified as not being suicide ideators or attempters (specificity). For example, an SBQ-R Item 1 score of 2 was associated with the greatest sensitivity (100%) and specificity (96%) rates in the comparisons involving the suicidal and nonsuicidal psychiatric adolescent inpatients. Table 3 also shows, for each sample, the proportion of individuals predicted as suicide ideators or attempters who were truly suicide ideators or attempters (positive predictive value), and the proportion of individuals predicted as not being ideators or attempters who truly were nonsuicide ideators or attempters (negative predictive value). All these estimates are high in support of the criterion-related validity of the SBQ-R Item 1.

Results of the ROC analyses involving the SBQ-R total score are presented in Table 4. In the comparisons that involved the suicidal and nonsuicidal groups, a cutoff score of 8 was identified as most useful in suggesting that (a) adolescent and adult psychiatric inpatients with established suicide status were correctly identified as positive for suicide

Table 3
Receiver Operating Characteristic Analyses to Distinguish Suicidal vs. Nonsuicidal Individuals Using Item 1 From the Suicidal Behaviors Questionnaire–Revised

Sample	Cutoff score	AUC	*SE*	Sensitivity	Specificity	PPV	NPV
Adolescent Inpatients	2	.99	.012	1.00	.96	.95	1.00
Adult Inpatients	2	.92	.029	.80	.97	.95	.87
Adolescent High School	2	1.00	.00	1.00	1.00	1.00	1.00
Undergraduates	2	1.00	.00	1.00	1.00	1.00	1.00

Note. AUC = Area Under the Curve; PPV = Positive Predictive Value; NPV = Negative Predictive Value.

Table 4
Receiver Operating Characteristic Analyses to Distinguish Suicidal vs. Nonsuicidal Individuals Using the Suicidal Behaviors Questionnaire-Revised Total Score

Sample	Cutoff score	AUC	*SE*	Sensitivity	Specificity	PPV	NPV
Adolescent Inpatients	8	.96	.020	.87	.93	.90	.99
Adult Inpatients	8	.89	.032	.80	.91	.87	.86
Adolescent High School	7	.98	.021	.83	.96	.75	.98
Undergraduates	7	.96	.034	.93	.95	.70	.99

Note. AUC = Area Under the Curve; PPV = Positive Predictive Value; NPV = Negative Predictive Value.

ideation or attempts (sensitivity), and (b) adolescents and adult psychiatric inpatients identified as nonsuicide ideators or attempters were correctly identified as not being suicide ideators or attempters (specificity). For example, an SBQ-R total cutoff score of 8 was most useful in maximizing both sensitivity (87%) and specificity (93%) rates in the adolescent inpatient samples. Additionally, the related positive predictive and negative predictive values are presented in Table 4.

For the nonclinical high school and undergraduate samples, a cutoff score of 7 was most useful in maximizing both the sensitivity and specificity rates in the separate samples. For example, in the high school sample, the SBQ-R total cutoff score of 7 maximized both the sensitivity (83%) and specificity (96%) rates. All the related positive predictive and negative predictive values also were high. In summary, in both the clinical and nonclinical samples, similar cutoff scores of 2 or greater on the SBQ-R Item 1 were identified in maximizing both the sensitivity and specificity rates. However, on the total SBQ-R score, different cutoff scores were identified for the clinical and nonclinical samples. The AUCs for both the SBQ-R Item 1 and SBQ-R total scores were significantly higher than the lines of no discrimination, suggesting that each score was useful in the separate groups in differentiating the suicidal and nonsuicidal subgroups.

Discussion

Even though Linehan (1981) first developed the full version of the SBQ almost two decades ago, and several 4-item versions of this instrument are regularly used for research and clinical purposes (Cole, 1989; Cotton et al., 1995; Osman et al., 1996), published psychometric information on existing versions is limited. We conducted the current study to address this concern. Our goals were to provide a 4-item version of the SBQ, the SBQ-R, as a potential solution to focusing research on a validated version of this instrument in the suicide literature; to examine the internal consistency (alpha) reliability of the SBQ-R; to evaluate the ability of the SBQ-R to differentiate between suicidal and nonsuicidal subgroups; and to examine the criterion-related validity of the SBQ-R in separate samples of clinical and nonclinical adolescents and adults. In addition, we examined the utility of the SBQ-R as a risk measure of suicide-related behaviors, and potential cutoff scores that would maximize sensitivity and specificity rates in clinical and nonclinical samples.

The present study has provided acceptable internal consistency reliability (alpha) estimates of the SBQ-R in a range of adolescent and adult clinical and nonclinical samples. Scores on the SBQ-R were useful in differentiating between subgroups of the study participants. Specifically, in each independent study sample, the suicidal subgroup obtained higher scores than the nonsuicidal subgroups on the SBQ-R items and total scores. Logistic regression analyses, using data from the independent clinical samples, suggested that scores on the SBQ-R are useful as risk factors for suicide-related behaviors.

To date, the SBQ has been used primarily as a tool for grouping research participants based on level of suicidality (Connell & Meyer, 1991; Cotton & Range, 1996; Linehan & Nielsen, 1981; Osman,

Barrios, Grittmann, & Osman, 1993). No study has performed a ROC analyses to verify the validity of this approach. Evidence for criterion-related validity was well established in this study in that the ROC analyses identified cutoff scores that were most useful in maximizing the sensitivity and specificity rates for differentiating levels of suicide-risk within the independent study samples. A cutoff score of 2 or higher on the SBQ-R Item 1 is suggested for use with both clinical and nonclinical samples.

Results for the cutoff scores on the SBQ-R total were different for the clinical and nonclinical samples. In the adolescent and adult clinical samples, a cutoff score of 8 or higher was most useful in maximizing the sensitivity and specificity rates; in the nonclinical high school and undergraduate college samples, an SBQ-R cutoff score of 7 or higher was most useful in maximizing the sensitivity and specificity rates. This slight difference in SBQ-R total cutoff scores may relate to a number of factors including the range of items included in the SBQ-R total score. Regardless, the AUC for each independent sample was substantially above the level of chance, suggesting that the related cutoff scores were useful in differentiating between the levels of suicide-risk in these samples. Because no other published studies have provided information on the sensitivity and specificity of the SBQ for adolescents and adults, we recommend caution in using these results for comparison purposes. Overall, it appears that higher cutoff scores are needed by psychiatric inpatients on the SBQ-R total score, but it would be premature to suggest this as the standard score for any group. Our findings regarding cutoff scores on the SBQ-R are preliminary.

The present findings would be strengthened by research in at least four other areas. First, large sample sizes should be included in future investigations to determine if separate norms (means and standard deviations) for males and females are necessary. Replication of the current findings with more ethnically diverse samples would also be beneficial. In addition, the reporting period on the screening items should be adjusted to minimize the potential for underreporting of at-risk behaviors. We relied on self-reported history of suicidal behavior as a source of information for group formation. Future studies could use multiple methods (e.g., structured interviews) of screening to form a range of at-risk groups (e.g., first-time vs. chronic attempters) in validating scores on the SBQ-R.

There may be several advantages to using the SBQ-R in clinical and nonclinical samples. Like most self-report measures, it is straightforward, brief, and easy for participants to complete (Range & Knott, 1997). Due to the wording of the four SBQ items, a broad range of information is tapped in a very brief administration. Not only can responses be used to identify at-risk individuals, but specific risk behaviors are reported on, instead of the level of risk which must be inferred from other self-report instrument. In other words, the SBQ directly assesses suicidality. However, the preliminary psychometric data presented here suggest that further work with this measure in clinical and nonclinical populations should be conducted. It is recommended that researchers searching for a brief, valid, and reliable tool with the ability to screen for potential suicide risk consider adopting the SBQ-R.

References

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Beck, A. T., Brown, G., Steer, R. A., Dahlsgaard, K. K., & Grisham, J. R. (1999). Suicide ideation at its worst point: A predictor of eventual suicide in psychiatric outpatients. *Suicide and Life-Threatening Behavior, 29*, 1-9.

Beck, A. T., & Steer, R. A. (1991). *Manual for the Beck Scale for Suicide Ideation*. San Antonio, TX: The Psychological Corporation.

Beck, A. T., Weissman, A., Lester, D., & Trexler, M. (1974). The measurement of pessimism: The Hopelessness scale. *Journal of Consulting and Clinical Psychology, 42*, 861-865.

Brener, N. D., Hassan, S. S., & Barrios, L. C. (1999). Suicidal ideation among college students in the United States. *Journal of Consulting and Clinical Psychology, 67*, 1004-1008.

Cannon, B., Mulroy, R., Otto, M. W., Rosenbaum, J. F., Fava, M., & Nierenberg, A. A. (1999). Dysfunctional attitudes and poor problem solving skills predict hopelessness in major depression. *Journal of Affective Disorders, 55*, 45-49.

Cole, D. A. (1988). Hopelessness, social desirability, depression, and parasuicide in two college student samples. *Journal of Consulting and Clinical Psychology, 56*, 131-136.

Cole, D. A. (1989). Validation of the Reasons for Living Inventory in general and delinquent adolescent samples. *Journal of Abnormal Child Psychology, 17*, 13-27.

Connell, D. K., & Meyer, R. G. (1991). Adolescent suicidal behavior and popular self-report instruments of depression, social desirability, and anxiety. *Adolescence, 26*, 113-119.

Cotton, C. R., Peters, D. K., & Range, L. M. (1995). Psychometric properties of the Suicidal Behaviors Questionnaire. *Death Studies, 19*, 391-397.

Cotton, C. R., & Range, L. M. (1996). Suicidality, hopelessness, and attitudes toward life and death in clinical and nonclinical adolescents. *Death Studies, 20*, 601-610.

Cull, J. G., & Gill, W. S. (1982). *Suicide Probability Scale*. Los Angeles, CA: Western Psychological Services.

Engelhart, C., Eisenstein, N., & Meininger, J. (1994). Psychometric properties of the Neurobehavioral Cognitive Status Exam. *The Clinical Neuropsychologist, 8*, 405-415.

Gutierrez, P. M., Osman, A., Barrios, F. X., Kopper, B. A., Baker, M. T., & Maraburda, C. M. (in press). Development of the Reasons for Living Inventory for Young Adults. *Journal of Clinical Psychology*.

Gutierrez, P. M., Osman, A., Kopper, B. A., Barrios, F. X., & Bagge, C. L. (2000). Suicide risk assessment in a college student population. *Journal of Counseling Psychology, 47*, 403-413.

Joiner, T. E., Rudd, D. M., & Rajab, M. H. (1999). Agreement between self- and clinician-rated suicidal symptoms in s clinical sample of young adults: Explaining discrepancies. *Journal of Consulting and Clinical Psychology, 67*, 171-176.

Kaplan, M. L., Asnis, G. M., Sanderson, W. C., Keswani, L., DeLecuona, J. M., & Joseph, S. (1994). Suicide assessment: Clinical interview vs. self-report. *Journal of Clinical Psychology, 50*, 294-298.

Lewinsohn, P. M., Rohde, P., & Seeley, J. R. (1996). Adolescent suicidal ideation and attempts: Prevalence, risk factors, and clinical implications. *Clinical Psychology: Science and Practice, 3*, 25-46.

Linehan, M. M. (1981). *The Suicidal Behaviors Questionnaire (SBQ)*. Unpublished instrument, University of Washington, Seattle.

Linehan, M. M. (1996). *The Suicidal Behaviors Questionnaire-14 (SBQ-14)*. Unpublished instrument, University of Washington, Seattle.

Linehan, M. M., & Addis, M. E. (1983). *Screening for suicidal behaviors: The Suicidal Behaviors Questionnaire*. Unpublished manuscript, University of Washington, Seattle.

Linehan, M. M., Goodstein, L. J., Nielsen, S. L., & Chiles, J. A. (1983). Reasons for staying alive when you are thinking of killing yourself: The Reasons for Living Inventory. *Journal of Consulting and Clinical Psychology, 51*, 276-286.

Linehan, M. M., & Nielsen, S. L. (1981). Assessment of suicide ideation and parasuicide: Hopelessness and social desirability. *Journal of Consulting and Clinical Psychology, 49*, 773-775.

Morey, L. C., & Lanier, V. W. (1998). Operating characteristic of six response distortion indicators for the Personality Assessment Inventory. *Assessment, 5*, 203-214.

Mossman, D. (1994). Assessing predictions of violence: Being accurate about accuracy. *Journal of Consulting and Clinical Psychology, 62*, 783-792.

Nicholson, R. A., Mouton, G. J., Bagby, R. M., Buis, T., Peterson, S. A., & Buigas, R. A. (1997). Utility of the MMPI-A indicators of response distortion: Receiver operating characteristic analysis. *Psychological Assessment, 9*, 471-479.

O'Carroll, P. W., Berman, A. L., Maris, R. W., Moscicki, E. K., Tanney, B. L., & Silverman, M. M. (1996). Beyond the Tower of Babel: A nomenclature for suicidology. *Suicide and Life-Threatening Behavior, 26*, 237-252.

Osman, A. (1998). *The Reasons for Living Inventory for Young Adults (RFL-YA)*. Unpublished inventory, University of Northern Iowa, IA.

Osman, A., Barrios, F. X., Grittmann, L. R., & Osman, J. R. (1993). The Multi-Attitude Suicide Tendency Scale: Psychometric characteristics in an American sample. *Journal of Clinical Psychology, 49*, 701-708.

Osman, A., Kopper, B. A., Barrios, F. X., Osman, J. R., Besett, T. M., & Linehan, M. M. (1996). The Brief Reasons for Living Inventory for Adolescents (BRFL-A). *Journal of Abnormal Child Psychology, 24*, 433-443.

Range, L. M., & Knott, E. C. (1997). Twenty suicide assessment instruments: Evaluation and recommendations. *Death Studies, 21*, 25-58.

Reynolds, W. M. (1991). *Adult Suicidal Ideation Questionnaire*. Odessa, FL: Psychological Assessment Resources.

Rudd, M. D. (1989). The prevalence of suicidal ideation among college students. *Suicide and Life-Threatening Behavior, 19*, 173-183.

Shain, B. N., Naylor, M., & Alessi, N. (1990). Comparison of self-rated and clinician-rated measures of depression in adolescents. *American Journal of Psychiatry, 147*, 793-795.

Sidley, G. L., Calam, R., Wells, A., Hughes, T., & Whitaker, K. (1999). The prediction of parasuicide repetition in a high-risk group. *British Journal of Clinical Psychology, 38*, 375-386.

Simon, T. R., & Crosby, A. E. (2000). Suicide planning among high school students who report attempting suicide. *Suicide and Life-Threatening Behavior, 30*, 213-221.

Appendix

SBQ-R

Identification#:_____ **Gender:** Male/Female **Age:**_____

Instructions: Please circle the number beside the statement or phrase that best applies to you.

1. **Have you ever thought about or attempted to kill yourself?** (Circle only one):

   1 = Never
   2 = It was just a **brief** passing thought

   3a = I have **had a plan** at least once to kill myself but **did not** try to do it
   3b = I have **had a plan** at least once to kill myself and really wanted to die

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   4a = I have **attempted** to kill myself, but **did not** want to die
   4b = I have **attempted** to kill myself, and really hoped to die

2. **How often have you thought about killing yourself in the past year?** (Circle only one):

   1 = Never 2 = Rarely (1 time) 3 = Sometimes (2 times)
   4 = Often (3-4 times) 5 = Very Often (5 or more times)

3. **Have you ever told someone that you were going to commit suicide, or that you might do it?** (Circle only one):

   1 = No

   2a = Yes, at one time, but **did not** really want to die
   2b = Yes, at one time, and really wanted to do it

   3a = Yes, more than once, but **did not** want to do it
   3b = Yes, more than once, and really wanted to do it

4. **How likely is it that you will attempt suicide someday?** (Circle only one):

   0 = Never 3 = Unlikely 5 = Rather Likely
   1 = No chance at all 4 = Likely 6 = Very Likely
   2 = Rather Unlikely