

## A Psychometric Investigation of the Suicide Status Form II with a Psychiatric Inpatient Sample

AMY K. CONRAD, PhD, AARON M. JACOBY, PhD, DAVID A. JOBES, PhD,  
TIMOTHY W. LINEBERRY, MD, CATHERINE E. SHEA, MSN, CNS,  
THERESA D. ARNOLD EWING, RN, PHYLLIS J. SCHMID, MSN,  
SUSAN M. ELLENBECKER, MSN, JOY L. LEE, BSN, KATHRYN FRITSCHKE, BSN,  
JENNIFER A. GRENELL, BSN, JESSICA M. GEHIN, MS, BSN, AND SIMON KUNG, MD

We investigated the psychometric validity and reliability of the Suicide Status Form-II (SSF-II) developed by Jobes, Jacoby, Cimboic, and Hustead (1997). Participants were 149 psychiatric inpatients (108 suicidal; 41 nonsuicidal) at the Mayo Clinic. Each participant completed assessment measures within 24 hours of admission and 48–72 hours later. Factor analyses of the SSF core assessment produced a robust two-factor solution reflecting chronic and acute response styles. The SSF core assessment had good to excellent convergent and criterion validity; pre-post SSF ratings also demonstrated moderate test-retest reliability. The results replicated previous research and show that the SSF-II is psychometrically sound with a high-risk suicidal inpatient sample.

A myriad of suicide assessment instruments exist for clinical and research use (Brown, 2007). These tools tend to measure different aspects of suicidal states such as suicidal ideation, suicidal behavior, lethality of previous attempts, and attitudes and opinions about suicide. But as discussed elsewhere (Jobes,

2006; Jobes, Eyman, & Yufit, 1995) most of these assessment tools are *not* routinely used in clinical practice. Anecdotal observations and clinician survey data suggest that possible explanations for their lack of use include impressions that such tools tend to be too long, obtained scale scores may not readily translate to clinical practice, and the use of such assessments can be seen as off-putting to suicidal patients (Jobes, 2006; Jobes et al., 2004). In direct response to these possible concerns, Jobes and colleagues (1997) set about developing a very different kind of assessment tool—the Suicide Status Form (SSF). In the years since its initial development, the SSF has evolved into a multipurpose clinical assessment and treatment planning tool that uniquely assesses both quantitative and qualitative aspects of suicidal risk. It is the central clinical tool used in the Collaborative Assessment and Management of Suicidality (CAMS) approach to suicide

---

AMY K. CONRAD, PhD, is with the Walter Reed Army Medical Center; AARON M. JACOBY, PhD, is with VA Pittsburgh Healthcare System; DAVID A. JOBES, PhD, is with The Catholic University of America; and TIMOTHY W. LINEBERRY, MD, CATHERINE E. SHEA, MSN, CNS, THERESA D. ARNOLD EWING, RN, PHYLLIS J. SCHMID, MSN, SUSAN M. ELLENBECKER, MSN, JOY L. LEE, BSN, KATHRYN FRITSCHKE, BSN, JENNIFER A. GRENELL, BSN, JESSICA M. GEHIN, MS, BSN, and SIMON KUNG, MD are with the Mayo Clinic, Rochester MN.

Address correspondence to David A. Jobes, Ph.D., The Catholic University of America, Department of Psychology, 314 O'Boyle Hall, Washington, DC 20064; E-mail: Jobes@cua.edu.

(Jobes, 2006; Jobes & Drozd, 2004; Jobes, Wong, Conrad, Drozd, & Neal-Walden, 2005), and according to Range (2005), the SSF is one of the more widely used assessment tools in current clinical practice.

Since its inception, the core SSF assessment section has been made up of six five-point rating scales that assess a suicidal patient's current degree of *Psychological Pain*, *Stress*, *Agitation*, *Hopelessness*, and *Self-Hate*, as well as *Overall Risk* of suicide (Jobes, 2006). The suicidal patient is instructed to rate each item as to how they feel right now. For example, the psychological pain rating scale states: *Rate psychological pain (hurt, anguish, or misery in your mind, not stress, not physical pain)*. The patient then circles a number on the 1 to 5 rating scale (1 = low pain and 5 = high pain). The psychometric validity and reliability of the core SSF assessment section was first established using a sample ( $n = 103$ ) of suicidal college student outpatients (Jobes et al., 1997). In this study, researchers performed a series of factor analyses on the six core rating scale items and showed limited shared common variance, low communalities in the factor analyses, and a lack of inter-item multicollinearity. Taken together, these findings indicated that patient responses to these SSF items were not explained by a single underlying factor; rather the variables functioned quasi-independently. Additional analyses showed the SSF items had good convergent validity with well-accepted measures (all correlations were statistically significant and ranged from  $r = .25$  to  $r = .75$ ). Strong criterion-prediction validity was shown by a multivariate analysis of variance (MANOVA) of the six rating scale items; SSF ratings of suicidal participants were significantly elevated in comparison to SSF responses from nonsuicidal participants. Test-retest reliability of SSF ratings ranged from acceptable to good; two-week test-retest reliability showed correlation coefficients ranging from  $r = .35$  to  $r = .69$ . While the 1997 psychometric results were encouraging, there were nevertheless distinct limitations with the study (e.g., the use of mixed clinical and nonclinical samples). Moreover, the SSF has been legitimately critiqued

as being only generalizable to relatively low risk suicidal college students—a major threat to its relative clinical or research utility in relation to assessment of more pathological, higher risk, and more diverse samples.

Following the initial development of the SSF, a subsequent revision—the SSF-II—was pursued that provided more detailed definitions of each of the original core SSF assessment items, the addition of various qualitative assessments (Jobes & Mann, 1999; Jobes, 2000; Jobes et al., 2004; Luoma, 1999), as well as some additional assessment items and subsequent forms for treatment planning, tracking risk, and further documentation (Jobes, 2006). The six core SSF items remained essentially unchanged. However, given the limits of the 1997 study, there was an obvious need to further study psychometric properties of the SSF core assessment using a more rigorous methodology and using a higher risk and more generalizable suicidal sample. These various considerations thus form the basis of the current study: to conduct a rigorous psychometric study to further replicate and extend the validity, reliability, and factor structure of the core SSF assessment using a high-risk sample of psychiatric inpatients.

## METHOD

### *Setting*

The study was conducted at the Mayo Psychiatry and Psychology Treatment Center (MPPTC), St. Mary's Hospital, Rochester, MN. The MPPTC serves as the acute psychiatric hospital for the Mayo Clinic.

### *Participants*

The participants were 149 adult psychiatric inpatients admitted to one of the two units. The 108 treatment participants were inpatients who presented with suicidal ideation ( $N = 79$ ) or suicidal behavior ( $N = 29$ ) within 48 hours of admission. The 41 control participants were inpatients who had *not* had

suicidal ideation or suicidal behavior within 48 hours of admission. Of the treatment participants, 17 reported a previous history of suicidal ideation but no attempts, 28 reported a history of a single suicide attempt, and 46 reported a history of multiple attempts. Of the control participants, 10 reported a previous history of suicidal ideation but no attempts, seven reported a history of a single suicide attempt, and nine reported a history of multiple attempts. No specific inclusion criteria were applied, but prisoners, psychotic patients, and those deemed unable to complete the assessment tools secondary to cognitive inability were excluded from the study. The participant sample included 45 men and 104 women, ages 18 to 67 ( $M = 35.48$  years,  $SD = 11.93$ ;  $Mdn = 36.5$ ). The sample was predominantly Caucasian (90%), with the remainder of the sample consisting of the following racial composition: 5% Latino, 2% American Indian, 2% African-American, and 1% Asian. No significant demographic differences between suicidal/nonsuicidal samples were seen.

In terms of psychiatric diagnoses, all diagnoses were provided by board certified psychiatrists. Mood disorders were predominant, affecting 126 participants overall; 89 patients were diagnosed with Major Depressive Disorder, 20 were diagnosed with Dysthymic Disorder (15 of those overlapped with the Major Depressive Disorder patients), 13 were diagnosed with Depressive Disorder NOS, and 3 patients were diagnosed with Mood Disorder NOS. Sixteen patients were diagnosed with Bipolar Disorder. In total, 32 patients were diagnosed with Anxiety Disorders (13 with PTSD, 9 with Anxiety Disorder NOS, 5 with Panic Disorder, 4 with Generalized Anxiety Disorder, and 4 with Obsessive-Compulsive Disorder)—three PTSD subjects had other Anxiety Disorder diagnoses. Thirteen patients were diagnosed with Adjustment Disorders. A total of 36 patients were diagnosed with a personality disorder (25 with Borderline Personality Disorder). A total of 59 participants had substance abuse or substance dependence problems. There were no significant differences between the

suicidal and nonsuicidal samples in diagnoses. Given the absence of reliable SCID diagnoses, we did not use participant diagnoses as a covariate in the course of our various data analyses—the focus of the current study is fundamentally on *suicidal risk*, separate from diagnoses.

### *Materials*

*Suicide Status Form (SSF-II)*. The SSF-II is a revised version of the SSF (Jobes et al., 1997). The core SSF assessment is made up of five key theoretical constructs and a sixth item assessing overall risk of suicide. These items are rated by the patient using five point rating scales. The first three SSF-II constructs (pain, stress, and agitation) are based on Shneidman's theoretical work (1985, 1987, 1993). Shneidman (1993) argues the risk of suicide is greatest when each of these three psychological forces is at its maximum level. Shneidman (1985, 1987, 1993) defines Psychache (pain on the SSF-II) as an unbearable level of suicidal mental suffering. Shneidman's (1993) concept of press (stress on the SSF-II) is based on Murray's (1938) theory of needs and presses; these are various stressors that impinge on an individual's psychological world. Shneidman (1993) defines perturbation (agitation on the SSF-II) as a state of intense emotional upset; it includes cognitive constriction, impulsiveness, and an urgent disposition toward self-harm. The fourth item on the SSF-II assesses hopelessness, and is based on the work of Beck et al. (1979, 1990), who have argued that suicidal action is linked to hopelessness about the self, others, and the future. Research on the relationship between hopelessness and suicide has shown that hopelessness is among the most important variables in determining risk of completing suicide (Beck, Brown, Berchick, Stewart, & Steer, 1990; Beck, Steer, Kovacs, & Garrison, 1985; Fawcett et al., 1987). The fifth item on the SSF-II is self-hate and is based on Baumeister's (1990) theoretical work, which argues that suicides result from unbearable self-hatred and self-loathing. According to this theory, individu-

als complete suicide as a means of escaping unbearable experiences of the self (Baumeister, 1990). The sixth item on the SSF-II is the rating of overall risk of suicide—patients are asked to rate their own risk from extremely low to extremely high; the clinical-legal “bottom line” in the assessment of risk.

*Behavioral Health Questionnaire-20* (BHQ-20). The BHQ (Kopta & Lowry, 2002) consists of 20 self-report items, including items that indicate whether the participant is having suicidal thoughts. The four scales of the BHQ-20 have been shown to have good construct validity, Global Mental Health,  $F(3, 1258) = 179.38$ ; Well-Being,  $F(3, 1257) = 154.27$ ; Symptoms,  $F(3, 1257) = 141.78$ ; Life Functioning,  $F(3, 1252) = 128.60$ ;  $p < .0001$ , moderate concurrent validity (from  $r = -.41$  to  $r = -.83$ ), and test-retest reliability (ranging from .71 to .83; Kopta & Lowry, 2002).

*Outcome Questionnaire-45.2* (OQ-45.2). The OQ-45.2 (Lambert, Hansen, et al., 1996) is a 45-item self-report instrument that assesses the presence of symptoms that may be targets of clinical intervention. The OQ-45.2 asks the participant to rate how much each item applies to their feelings during the past week. The OQ-45.2 is intended to assess symptom-related suffering, interpersonal relationships, and social role functioning. The participant rates each item on a five-point scale with higher scores indicating poorer functioning. The OQ-45.2 has been shown to have good internal consistency ( $\alpha = .93$ ; Lambert, Hansen, et al., 1996) and good three-week test-retest reliability ( $r = 0.84$ ; Lambert, Burlingame, et al., 1996).

*Orbach & Mikulincer Mental Pain Scale* (OMMP). The OMMP (Orbach, Mikulincer, Sirota, & Gilboa-Schechtman, 2003) is a 44-item self-report instrument that assesses the participant's current experience of mental pain. The items address different aspects of the respondent's perception that life and the self have changed for the worse as well as the negative feelings that accompany that change. Participants rate each item on a five-point Likert scale. OMMP factors have been shown to be moderately correlated with mea-

asures of depressive cognition ( $r = .64$ ), anxious cognition ( $r = .51$ ), and emotion-focused coping ( $r = .50$ ). The OMMP has adequate internal consistency ( $\alpha = .78$  to  $\alpha = .95$ ) and good reliability, with a test-retest reliability coefficient ranging from  $r = .79$  to  $r = .94$  (Orbach et al., 2003).

*Pressure Inventory-III* (PI-III). The PI-III (Weiten, 1988) is a 48-item self-report measure that presents 42 examples of specific life stressors, or “pressures.” These pressures are evenly distributed among six categories: family relationships, work relationships, intimate relationships, school relationships, neighbor relationships, and self-imposed pressures. Participants are asked to rate how severely they have been experiencing each pressure in the past three months, using a six-point scale. Each category also includes a fill-in question. The PI-III has strong two-week test-retest reliability ( $r = .72$ ) and moderate concurrent validity ( $r = .57$ ; Weiten, 1988) with the Life Experiences Survey (refer to Sarason, Johnson, & Siegel, 1978).

*Strait-Trait Inventory for Cognitive and Somatic Anxiety* (STICSA). The STICSA (Ree, French, MacLeod, & Locke, 2008) is a self-report measure in which participants respond to 21 items related to their anxiety symptoms experienced at the time of administration and 21 items related to how much anxiety they experience in general. Participants rate the items on a four-point scale. The measure has been shown to have good internal consistency for the trait scale ( $\alpha = .94$ ) and for the state scale ( $\alpha = .97$ ), and all factors loaded strongly on the predicted factors on a confirmatory factor analysis (Ree et al., 2001). The STICSA has also been shown to have moderate concurrent validity ( $r = .42$  to  $r = .71$ ; Gros, Antony, Simms, & McCabe, 2007).

*Barratt Impulsiveness Scale-11* (BIS-II). The BIS-11 (Patton, Stanford, & Barratt, 1995) is a 30-item self-report measure that assess three types of impulsiveness: motor (i.e., acting without forethought) cognitive (i.e., making hasty decisions), and nonplanning (i.e., being oriented toward the present without regard for the future). Participants

respond to items using a four-point scale. Patton et al. (1995) reported internal consistency coefficients ranging from  $\alpha = .79$  to  $\alpha = .83$  for samples of college students, substance abuse patients, general psychiatric patients, and prison inmates. The BIS-11 has been found to distinguish significantly between participants with a history of suicide attempts and those without a history of suicide attempts,  $F(3,657) = 27.49$ ,  $p < .0001$ ; (Oquendo et al., 2004).

*Beck Hopelessness Scale (BHS).* The BHS (Beck, Weissman, Lester, & Trexler, 1974) is a 20-item true/false self-report measure that assesses three aspects of hopelessness: feelings about the future, loss of motivation, and expectations. Each item pertains to the participant's experiences of hopelessness during the past week. The pessimistic responses are added to obtain a total score. The BHS has high internal consistency (as indexed by KR-20 coefficients mostly in the .90s), test-retest reliability in the high .60s, and concurrent validity with clinicians' ratings of hopelessness ( $r = .74$ ; Beck, Steer, & Ranieri, 1988).

*Beck Self-Concept Test (BST).* The BST (Beck, Steer, Epstein, & Brown, 1990) is a 25-item self-report measure that assesses self-image. Participants are asked to rate themselves on various traits (both positive and negative), using other people they know as standards for comparison. Each item is rated on a five-point scale of increasing or decreasing levels of the given characteristic. The BST has good internal consistency ( $\alpha = .82$ ) and good test-retest reliability at one week (.88) and three months (.65; Beck et al., 1990).

*Reasons for Living Inventory (RFL).* The RFL (Linehan, Goodstein, Nielsen, & Chiles, 1983) is a self-report measure in which participants respond to 48 reasons for not completing suicide on a six-point scale that assesses how important each reason is to the participant. The RFL has high internal reliability ( $\alpha = .74$  to  $\alpha = .94$ ; Linehan et al., 1983) and strong three-week test-retest reliability ( $r = .83$ ; Osman, Jones, & Osman, 1991). Studies have found that people with a

history of suicide attempts report fewer reasons for living on the RFL (Oquendo et al., 2004).

### *Procedure*

Nine nurses on staff in the treatment center identified eligible participants from among the new admissions. The nurses, two staff psychiatrists, and one resident psychiatrist served as surveyors who explained the study and the informed consent form to each patient and asked the patient to complete the form. A nurse did not conduct informed consent with a patient under that nurse's care, but asked another clinician to do so to avoid any appearance of coercion. Each patient participant was given a packet of assessment measures to complete within 24 hours of admission, and another packet 48–72 hours later. Participants completed the SSF-II and the nine established measures; all measures were self-report questionnaires.

### *Statistical Analyses*

*Factor Analysis.* The purpose of the factor analysis was to determine the relative independence of the five key theoretical SSF-II constructs. While these variables are linked to different theories, concerns have existed that they were potentially multicollinear (which would undermine the ability of each variable to describe unique and specific variance). To address this concern, Spearman correlations were initially conducted to establish that the items are not redundant with each other. Next, factor analyses were used to uncover latent variables that account for covariance among the manifest variables (Costello & Osbourne, 2005). A maximum likelihood factor extraction method was chosen first because it allows for adjustments to achieve goodness-of-fit to the model and it tests the significance of the factor loadings and inter-item correlations (Fabrigar, Wegener, MacCallum, & Strahan, 1999). An additional maximum likelihood factor analysis was conducted, but without the Overall Risk item. This exclusion was

justified because the Overall Risk item is fundamentally different from the other 5 scales, being a summative construct and not theoretically derived.

While the maximum likelihood factor analysis method assumes a normal distribution, these analyses had accentuated the non-normality of the underlying data. The Pain, Stress, Hopelessness, and Self-Hate variables were skewed toward the higher (i.e., more pathological) end. Given the non-normality of this sample, alternative factor analysis methods were considered. Rather than using the traditional Pearson correlation matrices to generate the solution, a Spearman correlation matrix was used to account for the non-normality of some SSF-II variables. In general, using a Spearman correlation matrix instead of a Pearson matrix is superior when there are limited numbers of subjects that sometimes can result in non-normal, skewed distributions; a Spearman correlation matrix takes into account the relative weight of variable values and better accounts for outliers because it ranks all variable values. Furthermore, a Spearman correlation matrix typically is more conservative than a traditional Pearson correlation matrix (Fabrigar et al., 1999). Following the factor extraction, the solution was rotated to make the interpretation more meaningful. An oblique rotation was chosen because the issues studied were not expected to be orthogonal (Fabrigar et al., 1999) and the promax rotation was chosen specifically because its results tend to be more replicable (Tinsley & Tinsley, 1987).

Communality estimates were examined to determine goodness-of-fit of the model for each variable. Communality is the percent of variance in a given variable that is explained by all the factors collectively (Nunnally & Bernstein, 1994). Low communality for a variable indicates that the factor model does not account well for that variable. Low communality across all the variables would indicate that the variables are measuring constructs that have little connection to each other. In a study of best practices in factor analysis, Costello and Osbourne (2005)

found that .40 to .70 is a reasonable range for communalities in social science data.

*Canonical Correlation.* To expand on the previously completed discriminant function analysis of 1997, a canonical correlation was conducted on the first 5 SSF rating scales. In the 1997 study, overall risk was included in the discriminant function analysis. For the current study, overall risk was not included in this analysis as it is a summary variable, distinctively different from the other 5 rating scales. The nonparametric canonical correlation was chosen over a discriminant function analysis to better account for non-normal distributions.

*Validity.* Similar to the Jobes et al. (1997) approach, this study aimed to establish the validity of the six SSF-II core constructs; Spearman correlations were used to assess the convergent validity of the six core SSF by correlating ratings to these items to the total scores on well-established, psychometrically sound, instruments shown to measure the same constructs.

It should be noted that Spearman correlations were performed to assess the potential intercorrelations among the nine established assessment measures used for the convergent validity analyses. This was important because the measures were used in this study to assess meaningfully different constructs (i.e., Pain, Stress, Agitation, Hopelessness, and Self-Hate), and therefore should be meaningfully different from each other.

*Between Group Comparisons.* Having data from a nonsuicidal psychiatric inpatient sample as well as from a suicidal psychiatric inpatient sample afforded the opportunity to study whether the SSF-II could significantly distinguish between suicidal and nonsuicidal psychiatric inpatients (i.e., criterion validity). First, it was important to assess overall distress levels between the two participant groups, in order to establish that what distinguishes the two groups is indeed the presence or lack of suicidality, rather than simply overall distress. To this end, an independent sample t-test was conducted on the OQ-45.2—a

measure of overall distress—and we found that there was no significant difference between the two groups in terms of distress.

We attempted to establish the criterion validity of the six core SSF items by using a multivariate analysis of variance (MANOVA) on the ratings of the six core scale ratings made by our suicidal psychiatric inpatients and by our nonsuicidal psychiatric inpatients. To further establish that the differences were not due to overall distress, but rather to specific differences between SSF variable ratings, the OQ-45.2 total values were included in a MANCOVA.

*Reliability.* The reliability of the six core rating scale items was established using t-tests for dependent samples after an interval of 48–72 hours.

**RESULTS**

*Factor Analysis*

The results of the Spearman correlations showed that the highest inter-item correlations were between Hopelessness and Self-Hate ( $r = .62$ ) and between Hopelessness and Pain ( $r = .59$ ). None of the inter-item correlations was high, providing evidence that the five items are not redundant with each other (see Costello & Osborne, 2005; refer to Table 1).

The initial maximum likelihood factor analysis was conducted using all six core rat-

ing scale items (i.e., the five key theoretical items and the Overall Risk item) and resulted in a two-factor solution that accounted for 69% of the total variance. The second maximum likelihood factor analysis, which was conducted without the Overall Risk item, also resulted in a strong two-factor solution, accounting for about 74% of the total variance.

The Spearman factor analysis on the five theoretical rating scales resulted in a two-factor solution that replicates the results of the psychometric study of the first version of the SSF (Jobes et al., 1997). In the present sample, Factor 1 accounts for about 53.6% of the variance and Factor 2 accounts for an additional 18.6% of the variance. The total solution accounts for about 72% of the overall total variance. As shown in Table 2, with the inclusion of the promax rotation, Factor 1 had very strong loadings including self-hate (.88), hopelessness (.85), and pain (.74). Factor 2 had strong loadings as well, including agitation (.92) and stress (.78). This factor analysis produced good communality estimates (Pain = .63, Stress = .71, Agitation = .80, Hopelessness = .76, and Self-Hate = .72), suggesting the model works well for each variable.

*Canonical Correlation*

The results of the canonical correlation were quite favorable with an overall correlation of .40,  $\chi^2(5) = 23.60$ ,  $p < .001$ .

**TABLE 1**  
*Inter-Item Correlation Matrix of the Five Key Theoretical SSF-II Items*

SSF-II Item	1	2	3	4	5
1. Pain	—	.35*	.35*	.59*	.49*
2. Stress		—	.49*	.44*	.37*
3. Agitation			—	.30*	.23*
4. Hopelessness				—	.62*
5. Self-hate					—

*Note.* \*Correlation is significant at  $p < .01$  (two-tailed).

**TABLE 2**  
*Factor Analysis Results: Spearman Promax Rotated Factor Pattern*

SSF-II Item	Factor 1	Factor 2
Self-hate	.88***	-.09
Hopelessness	.85***	.05
Pain	.74***	.10
Agitation	-.07	.92***
Stress	.12	.78***

*Note.* \*\*\*Value is greater than 0.4

Hopelessness (.84), Self-hate (.74), and Pain (.39) correctly classified patients into chronic nonresolvers while Stress (.09) and Agitation (.03) classified patients into acute resolvers. The overall canonical correlation matrix correctly classified 71.8% of all patients into these two groups.

### Validity

Spearman correlations conducted to assess convergent validity were almost all significant at the .01 level (Table 3). Although the Spearman analyses were ultimately reported as results because they account for some of the non-normal distribution of scores, the Pearson product moment correlations for Pain, Agitation, Hopelessness, Self-Hate, Overall Risk, and Reasons for Living were all significant as two-tailed analyses and were generally moderate in magnitude.

In convergent validity analyses, the SSF-II Stress variable was not significantly correlated to one targeted measure—the PI-III. The STICSA (especially the STICSA-

State subscale) was significantly correlated to the SSF Stress variable.

Spearman correlations were performed to assess the potential intercorrelations among the nine established assessment measures used for the convergent validity analyses. With the exception of measures that were used to assess the same SSF-II item (e.g., OQ-45.2, BHQ, and OMMP, which were all compared to the SSF-II Pain item; see Table 3), the significant intercorrelations were low to moderate (ranging from .29 to .76; see Table 4), which suggests limited collinearity among the established measures (see Costello & Osborne, 2005).

The MANCOVA conducted on the ratings of the six core scale ratings made by our suicidal psychiatric inpatients and by our nonsuicidal psychiatric inpatients, along with OQ-45.2 totals as a covariate, yielded a significant overall finding,  $F(12, 224) = 22.07 < .001$ . As shown in Table 5, suicidal patient ratings of all six core SSF-II scale ratings together were consistently higher than nonsuicidal patient ratings; however, mean OQ-45.2 total scores were not significantly different (further suggesting that the overall distress of both samples was not fundamentally different). In other words, specific differences in SSF variable ratings—particularly Hopelessness, Self-Hate, and Overall Rating of Suicide Risk—accounted for the differentiation of these two inpatient sub-samples.

### Reliability

The first three test-retest t-test analyses yielded correlations that were statistically significant (Pain = .33, Stress = .23, Agitation = .35); however, the findings were more robust for the latter three variables (Hopelessness = .46; Self-Hate = .57, Overall Risk = .51). All correlations were significant at the  $p < .001$  level, except the SSF *stress* correlation, which was significant at  $p < .05$ .

In an effort to assess internal consistency of all supplemental measures used in this study, multiple cronbach alpha correlations were calculated for scale responses. Overall across scales, alphas were high ranging from the lowest ( $\alpha = .78$  to  $\alpha = .98$ ). All

**TABLE 3**  
*Convergent Validity: Correlations Between SSF-II Items and Established Measures of Similar Constructs*

SSF-II Item	Measure	<i>n</i>	Spearman rho
Pain	BHQ-20	113	-.35*
	OQ-45.2	127	.45*
	OMMP	110	.43*
Stress	PI-III	129	.12
	STICSA-S	130	.36*
	STICSA-T	136	.27*
	STICSA-Total	121	.31*
Agitation	STICSA-S	128	.42*
	STICSA-T	134	.28*
	STICSA-Total	119	.36*
	BIS	133	.36*
Hopelessness	BHS	140	.52*
Self-hate	BST	141	-.37*
Overall Risk	L-RFL	137	-.51*

*Note.* \*Correlation is significant at  $p < .01$  (one-tailed).

**TABLE 4**  
*Intercorrelations Among the Established Assessment Measures*

Measure	1	2	3	4	5	6	7	8
1. BHQ-20	—	.84*	.75*	.02	.58*	.43*	.64*	.40*
2. OQ-45.2	.84*	—	.81*	.09	.65*	.43*	.61*	.53*
3. OMMP	.75*	.81*	—	.07	.71*	.39*	.76*	.53*
4. PI-III	.02	.09	.07	—	.02	-.06	.08	.13
5. STICSA-Total	.58*	.65*	.71*	.02	—	.45*	.41*	.36*
6. BIS	.43*	.43*	.39*	-.06	.45*	—	.30*	.29*
7. BHS	.64*	.61*	.76*	.08	.41*	.30*	—	.52*
8. BST	.40*	.53*	.53*	.13	.36*	.29*	.52*	—

Note. \*Correlation is significant at  $p < .01$  (two-tailed).

alphas are as follows: BHQ ( $\alpha = .86$ ), BIS ( $\alpha = .84$ ), BST ( $\alpha = .78$ ), BHS ( $\alpha = .92$ ), OMMP ( $\alpha = .98$ ), PI ( $\alpha = .91$ ), RFL ( $\alpha = .95$ ), and STICSA ( $\alpha = .95$ )

## DISCUSSION

The results of the Spearman correlations between the five key theoretical SSF-II items showed that none of the inter-item correlations was high, providing evidence that the five items are not redundant with each other (refer to Table 1). The two maximum likelihood factor analyses (the second conducted without the Overall Risk item) resulted in strong two-factor solutions, and the

second accounted for about 74% of the total variance. The Spearman factor analysis on the five theoretical rating scale items resulted in a two-factor solution that replicates the results of the psychometric study of the first version of the SSF (Jobes et al., 1997). This was a much more potent set of findings in comparison to the original SSF factor analysis, which had accounted for only 36% of the common variance (Jobes et al., 1997). For this sample, the communality estimates were good, suggesting the model works well for each variable. By comparison, the communality scores for the 1997 study had been low (Pain = .30, Press = .16, Agitation = .72, Hopelessness = .55, Self-Hate = .20, and Overall Risk = .24)

**TABLE 5**  
*Comparison of Suicidal Patients to Nonsuicidal Patients on SSF-II Items*

SSF item	Suicidal patients		Nonsuicidal patients		Univariate $F$
	$M$	$SD$	$M$	$SD$	
Pain	3.82	1.24	3.44	1.34	2.644
Stress	3.87	1.25	3.78	1.35	0.133
Agitation	2.90	1.24	2.93	1.39	0.018
Hopelessness	3.81	1.29	2.83	1.41	16.030**
Self-hate	3.74	1.31	2.88	1.44	12.083**
Overall risk	2.68	1.27	1.55	0.77	28.467**
OQ-45 total	125.22	23.13	130.47	26.10	1.63

Note. \*\* $F$  statistic is significant at  $p < .001$ .

This two-factor solution—and its relative robustness—provides compelling evidence that the SSF-II is assessing distinctly different suicidal states. These results were important because one might reasonably expect a one-factor solution with a five variable factor analysis. However, this set of factor analyses suggests the presence of distinctly different response sets that imply distinctly different typologies of suicidal states.

The results of a canonical correlation further delineate this finding demonstrating that responses to SSF ratings can reliably categorize patients into two distinct groups: those acutely suicidal versus those more chronically suicidal. Consistent with factor analytic findings, ratings of hopelessness, self-hate, and pain correctly classified those patients whose suicidality was more chronic and unrelenting whereas ratings of agitation and stress classified those whose suicidality was relatively quick to resolve (acute resolvers). The results of the current canonical correlation analysis expand upon the discriminant function analysis of the Jobes et al. 1997 study, which had classified suicidal participants into two groups: acute resolvers and chronic nonresolvers. This earlier study had shown that overall, acute resolvers gave higher ratings to Agitation and Hopelessness than did chronic nonresolvers. Conversely, chronic nonresolvers gave higher ratings to rate Stress, Self-Hate, and Overall Risk than did acute resolvers. In the 1997 study, Hopelessness was the key variable in differentiating the sub-sample of patients who rapidly resolved their suicidal ideation from those who were chronically suicidal. The current canonical correlation analysis produced some markedly different results, and as such contributes to the growing body of research describing two very different sub-groups of suicidal individuals. For example, Rudd et al. (2006) differentiate between Risk Factors and Warning Signs for suicide; Warning Signs indicate near-term risk, whereas Risk Factors increase the risk over time, but not necessarily immediately. Warning Signs tend to be “episodic and variable,” whereas Risk Factors are static and enduring (Rudd et al., 2006).

These factors have importance in clinical treatment because they affect the question of whether the patient is safe to leave the clinician’s office, or is potentially at imminent risk of suicide.

In this spirit, ratings of Self-Hate, Hopelessness, and Pain may reflect a longer term set of interactive variables (i.e., risk factors) that typify a chronic-type suicidal patient. Such patients may have an enduring inclination toward suicidal thoughts and behaviors. Indeed, for such patients suicidal ideation may be familiar, even comforting, and may reflect a more trait-like quality (i.e., static and enduring) in the presence of possible Axis II pathology (Jobes, 1995). Interestingly, in the 1997 study of the SSF (Jobes et al., 1997) the SSF Self-Hate variable was the key variable in differentiating the sample that experienced more chronic suicidal states. In another study, Jobes, Kahn-Greene, Greene, and Goeke-Morey (2009) further found that SSF-II ratings of Hopelessness and Self-Hate significantly moderated the frequency of suicidal thoughts as they evolve over the course of clinical care.

Likewise, ratings of Agitation and Stress might typify a more acutely suicidal patient, one who might be more likely to have Axis I diagnoses (e.g., major depressive disorder) and for whom suicidality may be an unusual or uncomfortable situation-specific *state* (i.e., episodic and variable). The current research shows support for Agitation and Stress as possible *warning signs* for perhaps the more proximate possibility of actual suicidal behaviors. Because we have no treatment outcomes for the patients in our current sample, these observations remain theoretical and speculative, but the implications for clinical assessment and treatment could be quite meaningful (refer to discussions by Jobes, 1995, 2000, 2006).

#### *Validity*

Notably, the Spearman correlations used to establish convergent validity in this study are higher than those of the previous psychometric study (Jobes et al., 1997). Con-

vergent validity of the Stress item was established, but not in the way expected. Frankly, this particular SSF variable has been somewhat confounding. Unlike in the Jobes et al. (1997) study, in this study, the SSF-II Stress variable was not significantly correlated to one targeted measure—the PI-III. It is likely that the variable did not have convergent validity with the PI-III because the latter is a global measure of pressing issues, measuring the number of contributing factors, not just magnitude. On the other hand, the Stress variable is quite specific, measuring the respondent's subjective experience of the intensity of stress, rather than the number of life areas in which the individual has been subject to stress. Alternative analyses were therefore performed. The STICSA (especially the STICSA-State subscale) was significantly correlated to the SSF Stress variable. This is not surprising as the STICSA measures anxiety, which is related to both the SSF Stress and Agitation variables. The low to moderate (see Table 4) intercorrelations between the established measures used to assess convergent validity suggests limited collinearity among these measures.

It is noteworthy to underscore the importance of the significant overall finding of the MANCOVA (that was used to assess criterion validity). The nonsuicidal group was comprised of psychiatric inpatients from the exact same units (Acute Care and Mood Disorders) as the suicidal sample and typically in the extant literature suicidal inpatients usually appear more similar than different when compared to nonsuicidal inpatients (refer to Berman, Jobes, & Silverman, 2006). Unlike in the 1997 study, in the present study, the SSF variables of Hopelessness, Self-Hate, and Overall Risk drove the MANCOVA, hence discriminating people who may want to kill themselves versus those who may not. In relation to previous findings, these particular SSF variables were more associated with a chronic typology of suicidal risk. At the univariate level, Hopelessness, Self-Hate, and Overall Risk all yielded significant results, whereas Pain, Stress, and Agitation merely approached significance. It is perhaps not

surprising that these items are not as strong in the MANCOVA—for many, Pain, Stress, and Agitation are associated with severe psychiatric illness, independent of suicidality.

### *Reliability*

Undoubtedly, the relative weakness of the first three correlations is partly an artifact of the treatment the patients received in the 48–72 hours between assessments, which often consisted of changes in pharmacotherapy intended to provide quick symptom reduction as well as the containing effect of inpatient care where basic activities of living (eating, bathing, sleeping) are monitored and in some cases assisted. As previously noted, Pain, Stress, and Agitation can be endemic of sitting in any hospital and thereby be more subject to variability over time and may be intrinsic to on-going severe psychiatric illness. As we have seen, the variables that tend to discriminate suicidal people are Hopelessness, Self-Hate, and Overall Risk—and these variables appear to be less variable accordingly.

## GENERAL DISCUSSION

Valid and reliable assessment instruments are obviously important in the assessment and treatment of individuals who are suicidal. The present psychometric study of the Suicide Status Form II has clearly established the psychometric strengths of the tool by replicating and extending earlier findings on the previous version of the SSF, using a much more rigorous methodology and more diverse and higher risk sample. In the current study, we were able to investigate and show: (a) the relative quasi-independence of the six core SSF variables, (b) the concurrent and criterion-prediction validity of the core SSF variables, and (c) significant test-retest reliability of the core SSF variables. Moreover, the current study showed that distinct subtypes of suicidal patients exist within a cross section of psychiatric inpatients, namely a chronic typology defined by Self-Hate, Hope-

lessness, and Psychological Pain which was distinctly different from an acute typology defined by Agitation and Stress.

As with any study, there are limitations to the current study. For example, the sample size and lack of ethnic diversity in the sample may have affected the power of our statistical analyses and the potential generalizability of our findings. That said, we did have a number of significant and meaningful findings and the sample was much more diverse than our previous research with a broader age range, education, socio-economic status, and much higher levels of suicidal ideation/behaviors and more severe psychopathology overall. It should be noted that age was not significantly correlated to SSF-II responses. Sex was significantly associated with responses on the Self-Hate rating scale, with female participants reporting significantly more self-hate than male recipients. We are also aware of the potential confounding nature between the Stress and Agitation SSF variables (as reflected in the convergent validity analyses). Frankly, patients sometimes have difficulties making distinctions between these two constructs. We would contend, however, that the theoretical cogency and the clinical utility of these variables (e.g., the “urgency to act” aspect of Agitation) render them essential, particularly if the assessment is performed collaboratively—with the clinician and patient actually completing the SSF together—as recommended (see Jobes, 2006).

Future research could potentially build on the findings of this study to further examine other psychometric aspects of the SSF with larger and alternative samples of different kinds of suicidal patients. Using larger sample sizes with just the six rating SSF scales of suicidal and nonsuicidal patients could create the potential for answering addi-

tional questions about further differences between these groups (e.g., the severity of depression or other diagnoses). In addition, we hope to further use the SSF for studying treatment process and outcomes in relation to categorical clinical outcomes (refer to Jobes et al., 1999) as well as linear changes in suicidal ideation and behaviors over the course of care (refer to Jobes et al., 2005; Jobes et al., 2009). In addition, we will continue to investigate the use of the SSF with psychiatric inpatients as a means of advancing the quality and outcomes of inpatient psychiatric assessment and overall clinical care (refer to Lineberry et al., 2006; Lineberry, Bostwick, Rudd, & Jobes, 2007).

While there are some limits to the current effort, we would nevertheless point out that investigators often fail to replicate previous research findings that initially support the validity and reliability of an assessment tool. In test construction research, replication is crucial to further solidify the relative merits and make known the limitations of an assessment tool. To that end, the current study replicated and extended almost all of the major findings of our first psychometric study of the SSF. Moreover, the data from the current investigation provide solid psychometric support for the SSF-II and additional evidence of its overall utility and value as an assessment measure in its own right, as well as its use as the central clinical tool within the Collaborative Assessment and Management of Suicidality (CAMS) approach developed by Jobes (2006). Bottom-line, the SSF-II appears to be a psychometrically valid and reliable tool for the assessment of suicidal patients providing a relatively short and meaningful way for clinically understanding different kinds of suicidal risk that may lead to life-saving treatments therein.

## REFERENCES

- BAUMEISTER, R. F. (1990). Suicide as escape from self. *Psychological Review*, *97*, 90–113.
- BECK, A. T., BROWN, G. K., BERCHICK, R. J., STEWART, B. L., & STEER, R. A. (1990). Relationship between hopelessness and ultimate suicide: A replication with psychiatric outpatients. *American Journal of Psychiatry*, *147*, 190–195.
- BECK, A. T., KOVACS, M., & WEISSMAN, A.

- (1979). Assessment of suicidal ideation: The scale for suicide ideation. *Journal of Consulting and Clinical Psychology, 47*, 343–352.
- BECK, A. T., STEER, R. A., EPSTEIN, N., & BROWN, G. K. (1990). Beck self-concept test. *Psychological Assessment, 2*, 191–197.
- BECK, A. T., STEER, R. A., KOVACS, M., & GARRISON, B. (1985). Hopelessness and eventual suicide: A 10-year prospective study of patients hospitalized with suicidal ideation. *American Journal of Psychiatry, 142*, 559–563.
- BECK, A. T., STEER, R. A., & RANIERI, W. (1988). Scale for suicide ideation: Psychometric properties of a self-report version. *Journal of Clinical Psychology, 44*, 499–505.
- BECK, A. T., WEISSMAN, A., LESTER, D., & TREXLER, L. (1974). The measurement of pessimism: The hopelessness scale. *Journal of Consulting and Clinical Psychology, 42*, 861–865.
- BERMAN, A. L., JOBES, D. A., & SILVERMAN, M. M. (2006). *Adolescent suicide: Assessment and intervention*. Washington, DC: American Psychological Association.
- BROWN, G. K. (2007). A review of suicide assessment measures for intervention research with adults and older adults. Retrieved January 4, 2007, from <http://www.nimh.nih.gov/suicidresearch/adultsuicide.pdf>.
- COSTELLO, A. B., & OSBORNE, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research, & Evaluation, 10*, 1–9.
- FABRIGAR, L. R., WEGENER, D. T., MACCALLUM, R. C., & STRAHAN, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*, 272–299.
- FAWCETT, J., SCHEFTNER, W., CLARK, D., HEDEKER, D., GIBBONS, R., & CORYELL, W. (1987). Clinical predictors of suicide in patients with major affective disorders: A controlled prospective study. *American Journal of Psychiatry, 144*, 35–40.
- GROS, D. F., ANTONY, M. M., SIMMS, L. J., & McCABE, R. E. (2007). Psychometric properties of the state-trait inventory for cognitive and somatic anxiety (STICSA): Comparison to the State-Trait Anxiety Inventory (STAI). *Psychological Assessment, 19*, 369–381.
- JOBES, D. A. (1995). The challenge and the promise of clinical suicidology. *Suicide and Life-Threatening Behavior, 25*, 437–449.
- JOBES, D. A. (2000). Collaborating to prevent suicide: A clinical-research perspective. *Suicide and Life-Threatening Behavior, 30*, 8–17.
- JOBES, D. A. (2006). *Managing suicidal risk: A collaborative approach*. New York: Guilford Press.
- JOBES, D. A., & DROZD, J. F. (2004). The CAMS approach to working with suicidal patients. *Journal of Contemporary Psychotherapy, 34*, 73–85.
- JOBES, D. A., EYMAN, J. R., & YUFIT, R. I. (1995). How clinicians assess suicide risk in adolescents and adults. *Crisis Intervention and Time-Limited Treatment, 2*, 1–12.
- JOBES, D. A., JACOBY, A. M., CIMBOLIC, P., & HUSTEAD, L.A.T. (1997). Assessment and treatment of suicidal clients in a university counseling center. *Journal of Counseling Psychology, 44*, 368–377.
- JOBES, D. A., KAHN-GREENE, E., GREENE, J. A., & GOEKE-MOREY, M. (2009). Clinical improvements of suicidal outpatients: Examining suicide status form responses as predictors and moderators. *Archives of Suicide Research, 13*, 147–159.
- JOBES, D. A., & MANN, R. E. (1999). Reasons for living versus reasons for dying: Examining the internal debate of suicide. *Suicide and Life-Threatening Behavior, 29*, 97–104.
- JOBES, D. A., NELSON, K. N., PETERSON, E. M., PENTIUC, D., DOWNING, V., FRANCINI, K., & KIERNAN, A. (2004). Describing suicidality: An investigation of qualitative SSF responses. *Suicide and Life-Threatening Behavior, 34*, 99–112.
- JOBES, D. A., WONG, S. A., CONRAD, A. K., DROZD, J. F., & NEAL-WALDEN, T. (2005). The collaborative assessment and management of suicidality versus treatment as usual: A retrospective study with suicidal outpatients. *Suicide and Life-Threatening Behavior, 35*, 483–497.
- KOFTA, S. M., & LOWRY, J. L. (2002). Psychometric evaluation of the behavioral health questionnaire-20: A brief instrument for assessing global mental health and the three phases of psychotherapy outcome. *Society for Psychotherapy Research, 12*, 413–426.
- LAMBERT, M. J., BURLINGAME, G., UMPHRESS, V., HANSEN, N., VERMEERSCH, D., CLOUSE, G., ET AL. (1996). The reliability and validity of the outcome questionnaire. *Clinical Psychology and Psychotherapy, 3*, 106–116.
- LAMBERT, M. J., HANSEN, N. B., UMPHRESS, V., LUNNEN, K., OKIISHI, J., BURLINGAME, G., ET AL. (1996). *Administration and scoring manual for the outcome questionnaire (OQ 45.2)*. Wilmington, DE: American Professional Credentialing Services.
- LINEBERRY, T. W., BRANCU, M., VARGHESE, R., JOBES, D. A., JACOBY, A. M., CONRAD, A. K., ET AL. (2006, March). *Clinical use of the suicide status form on a psychiatric inpatient unit*. Poster presented at the Fourth Aeschi Conference, Aeschi, Switzerland.
- LINEBERRY, T. W., BOSTWICK, J. M., RUDD, M. D., & JOBES, D. A. (2007, April). *Suicide—a new national patient safety goal—where do we really stand?* Workshop presented at the annual conference of the American Association of Suicidology, New Orleans, LA.

- LINEHAN, M. M., GOODSTEIN, J. L., 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.
- LUOMA, J. B. (1999). *A new tool for the assessment and treatment of suicidal college students*. Unpublished manuscript, The Catholic University of America, Washington, DC.
- MURRAY, H. A. (1938). *Explorations in personality*. New York: Wiley.
- NUNNALLY, J. C., & BERNSTEIN, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill, Inc.
- OQUENDO, M. A., GALFALVY, H., RUSSO, S., ELLIS, S. P., GRUNEBaum, M. F., BURKE, A., & MANN, J. J. (2004). Prospective study of clinical predictors of suicidal acts after a major depressive episode in patients with major depressive disorder. *American Journal of Psychiatry, 161*, 1433–1441.
- ORBACH, I., SIROTA, P., MIKULINCER, M., & GILBOA-SCHECHTMAN, E. (2003). Mental pain: A multidimensional operationalization and definition. *Suicide and Life-Threatening Behavior, 33*, 219–230.
- OSMAN, A., JONES, K., & OSMAN, J. R. (1991). The Reasons for Living Inventory: Psychometric properties. *Psychological Reports, 69*, 271–278.
- PATTON, J. H., STANFORD, M. S., & BARRATT, E. S. (1995). Factor structure of the Barratt impulsiveness scale. *Journal of Clinical Psychology, 51*, 768–774.
- RANGE, L. M. (2005). The family of instruments that assess suicide risk. *Journal of Psychopathology and Behavioral Assessment, 27*, 133–140.
- REE, M. J., FRENCH, D., MACLEOD, C., & LOCKE, V. (2008). Distinguishing cognitive and somatic dimensions of state and trait anxiety: Development and validation of the state-trait inventory for cognitive and somatic anxiety (STICSA). *Behavioral and Cognitive Psychology, 36*, 313–332.
- RUDD, M. D., BERMAN, A. L., JOINER, T. E., NOCK, M. K., SILVERMAN, M. M., MANDRUSIAK, M., ET AL. (2006). Warning signs for suicide: Theory, research, and clinical applications. *Suicide and Life-Threatening Behavior, 36*, 255–262.
- SARASON, I. G., JOHNSON, J. H., & SIEGEL, J. M. (1978). Assessing the impact of life changes: Development of the life experiences survey. *Journal of Consulting and Clinical Psychology, 46*, 932–946.
- SHNEIDMAN, E. S. (1985). A psychological approach to suicide. In G. R. VandenBos & B. K. Bryant (Eds.), *Cataclysms, crises, and catastrophes: Psychology in action* (pp. 147–183). Washington, DC: American Psychological Association.
- SHNEIDMAN, E. S. (1987). *Definition of suicide*. New York: Wiley.
- SHNEIDMAN, E. S. (1993). *Suicide as psychache: A clinical approach to self-destructive behavior*. Northvale, NJ: Aronson.
- TINSLEY, H.E.A., & TINSLEY, D. J. (1987). Uses of factor analysis in counseling psychology research. *Journal of Counseling Psychology, 34*, 414–424.
- WEITEN, W. (1988). Pressure as a form of stress and its relationship to psychological symptomatology. *Journal of Social and Clinical Psychology, 6*, 127–139.