

Validating the Suicide Status Form for the Collaborative Assessment and Management of Suicidality in a Psychiatric Adolescent Sample

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Background: For adults, the Collaborative Assessment and Management of Suicidality (CAMS; Jobes, (2006, *Managing suicidal risk: A collaborative approach*, New York, Guilford) and Jobes, (2016, *Managing suicidal risk: A collaborative approach*, New York, Guilford)) is a treatment framework with replicated evidenced-based support for effectiveness. The current study is a psychometric validation of the Suicide Status Form (SSF-IV), the main assessment and treatment planning tool for CAMS, in an adolescent psychiatric sample.

Methods: Data were collected from 100 adolescents, aged 12–17, in inpatient settings (mean age = 14.6; 67.5% female, 80% white). Adolescents were administered Part A of the SSF-IV, as well as measures of overall suicide risk (both explicit and implicit), mental pain, Stress, Agitation, reasons for living, and self-esteem.

Results: Confirmatory factor analysis found a two-factor model to fit the data best, with Psychological Pain, Stress, and Agitation loading on one factor, and Hopelessness and Self-Hate on another. All of the core SSF constructs except Stress were significantly correlated with concurrent measures, and SSF overall suicide risk was significantly correlated with self-reported and implicit suicidality. Adolescents with suicide attempt history reported significantly higher scores on most core SSF items compared to no attempt history.

Conclusions: These results provide initial psychometric validation of the SSF for use with adolescents and indicate that it does not need to be adapted or modified for this age group.

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Suicide risk remains a major public health concern across all age groups as recent reports show increases in suicide rates during the past 10 years (Centers for Disease Control and Prevention, 2019) and suicide is the second leading cause of death for 12- to 17-year-olds (Drapeau & McIntosh, 2017). Surprisingly, to date there are few empirically supported suicide-specific treatments; however, the demand for such treatments has never been higher. One such treatment framework with replicated evidenced-based support for effectiveness is the Collaborative Assessment and Management of Suicidality (CAMS; Jobes, 2006, 2016). CAMS is a collaborative approach to the therapeutic assessment of suicidal risk, as well as a treatment framework that targets patient-defined “drivers” of suicidality in order to reduce risk and Hopelessness while building hope and reasons for living (Jobes, 2006, 2016). Thus far, a growing amount of evidence shows CAMS is effective in rapidly reducing suicide ideation, decreases Hopelessness while increasing hope, and is preferred by patients compared to treatment as usual (Jobes, Comtois, Brenner, Gutierrez, & O’Connor, 2016). Most of the existing evidence for CAMS’ effectiveness comes from studies of adults in various settings. The next wave of CAMS treatment is focused on evaluating its effectiveness with youth (Jobes, Vergara, Lanzillo, & Ridge-Anderson, in press; O’Connor, Brausch, Ridge Anderson, & Jobes, 2014; Ridge Anderson, Keyes, & Jobes, 2016), as evidence-based treatments for suicidal youth are desperately needed (Glenn, Franklin, & Nock, 2015).

The CAMS assessment and treatment process utilizes an assessment tool called the Suicide Status Form (SSF) that serves as the organizing document for suicide risk assessment and treatment planning. The SSF assesses both qualitative and quantitative aspects of suicide risk and centers on six core items: Psychological Pain, Stress, Agitation, Hopelessness, Self-Hate, and a patient-rated Overall Risk of Suicide. Patients rate each item on a scale of 1–5 (1 = low and 5 = high) based on how they are feeling right now. The SSF is a central tool to delivering CAMS as it assesses common drivers of suicide risk and

tracks their intensity during the course of treatment. Psychometric validity for the SSF has been shown in samples of suicidal college student outpatients (Jobes, Jacoby, Cimboic, & Husted, 1997), as well as in a sample of suicidal psychiatric inpatients (Conrad et al., 2009). These studies demonstrated that there are multiple underlying factors among the six core SSF items, the core items correlate well with similar measures (convergent validity), and suicidal patients do in fact have elevated ratings on core SSF items compared to non-suicidal patients (criterion validity) (Conrad et al., 2009; Jobes et al., 1997). Conrad and colleagues identified a two-factor structure, with Stress and Agitation loading on one factor, and Self-Hate, Hopelessness, and Psychological Pain loading on the other (2009). The first factor was labeled as “acute,” as Stress and Agitation were conceptualized to be more prevalent in suicidal patients who resolved their suicidal crisis quickly in treatment (Jobes et al., 1997). The second factor was labeled as “chronic,” as Self-Hate, Hopelessness, and Psychological Pain were conceptualized to be more prevalent in patients who did not resolve suicidal thoughts after numerous sessions, and thus were more difficult to treat (Jobes et al., 1997). The SSF has gone through several revisions based on both clinical implementation and research to enhance qualitative assessment, but the core items have remained largely unchanged (Jobes, 2000; Jobes & Mann, 1999; Jobes et al., 2004). The current iteration of the SSF is the SSF-IV (Jobes, 2016).

A common question from clinicians regarding the SSF is if it will translate well for adolescent patients. Clinicians express concern about younger clients’ ability to understand, conceptualize, and accurately rate constructs such as Psychological Pain or Hopelessness. One indirect test of this specific concern is found in a study from the Mayo Clinic’s child and adolescent psychiatry unit (Romanowicz, O’Connor, Schak, Swintak, & Lineberry, 2013). In this study, youth between the ages of 8–18 completed the SSF as a self-report measure upon admission, and the SSF was examined in relation

to other suicide risk factors from medical chart reviews. Elevated scores on the SSF did distinguish youth at higher risk for suicide including those of high school age and with a primary diagnosis of depression. While this study did not psychometrically validate the SSF with youth and administered the SSF in a nontypical self-report manner, it did show feasibility of administering the SSF to adolescents and noted that it allows youth to provide more information about their self-perceived drivers for suicide risk beyond traditional risk assessment. Additionally, it showed that responses on the SSF were related to other suicide risk factors, indicating that youth could understand and accurately respond to core items.

The present study also aimed to use multimethod assessment for overall suicide risk since prior validation studies of the SSF used self-report measures exclusively (Conrad et al., 2009; Jobes et al., 1997). The death/suicide implicit association test (d/s/IAT; Nock et al., 2010) has been tested in a variety of settings as an additional tool for measuring suicide risk, above and beyond client self-report and clinicians' ratings of risk. One study found that d/s IAT ratings were predictive of future suicide attempts in adults who had presented for suicide risk in the emergency department (Nock et al., 2010). Another study found that d/s IAT scores at psychiatric admission for adolescents predicted their suicide ideation severity at discharge, especially for adolescents who had longer stays (Glenn et al., 2017). The current study incorporated the d/s IAT as an additional measure of current suicide risk.

To further test the effectiveness of CAMS with youth, it is necessary to examine the psychometrics of the SSF within a clinical adolescent sample. Establishing strong validity of the SSF in its traditional assessment style of provider and patient completing the form side-by-side is essential as treatment effectiveness research of applying CAMS to younger populations takes place. The current study was designed to replicate the validity and factor structure of the core SSF assessment in a sample of adolescent psychiatric inpatients.

METHOD

Participants

Study participants were recruited from two sources: an adolescent behavioral health hospital and a children's crisis stabilization unit. Both are located in mid-size cities in the south-central region of the United States. A total of 100 adolescents between the ages of 12–17 were recruited for the study; the mean age was 14.61 ($SD = 1.52$), and the sample was 80% Caucasian and 67.5% female. See Table 1 for detailed demographic information. One-hundred seven eligible adolescents with parent consent were approached about participating in the study and 100 assented to participating. Suicide risk assessment is not recommended when patients are intoxicated, have active psychosis, or have impaired cognitive functions (Jobes, 2016). Therefore, these factors served as exclusion criteria.

Procedure

Upon admission, parents and guardians were given an informed consent form for the current study along with other admission paperwork. Parent consent forms indicated that adolescents may be approached to participate in the study during their stay at the hospital or crisis unit. Average length of stay for the behavioral health hospital is 4 days and for the crisis unit is 7 days. Research team members made frequent visits to both sites to maximize recruitment of consecutive admissions as much as possible. Members of the research team, which always included a master's level graduate student, visited the units and recruited adolescents with parent permission who also met inclusion criteria. Adolescents were given information about the study and asked to sign assent forms if they wished to participate. Research team members then met with adolescents in private rooms to complete the research protocol. Adolescents were first assessed with the University of Washington Risk Assessment Protocol (UWRAP; Linehan, Comtois, & Ward-Ciesielski, 2012) to determine baseline

TABLE 1
Demographic characteristics of the sample and descriptive statistics for all study variables

Demographic Variables	Sample (<i>n</i> = 100)
Age: <i>M</i> (<i>SD</i>)	14.61 (1.52)
Gender: (% Female)	67.5%
Ethnicity: (% White)	78.9%
Black	3.9%
Asian	1.3%
Multiethnic	7.9%
Latinx	5.2%
Other	2.6%
Sexual Orientation	
Other Sex Only	66.7%
Other Sex Mostly/Somewhat	8.4%
Both Sexes	12.5%
Same Sex Mostly	1.4%
Same Sex Only	5.6%
Parent Marital Status	
Married	20.3%
Separated	15.6%
Divorced	31.3%
Never Married	31.3%
Other	1.6%
Outcome Variables	
Death/Suicide IAT	-0.26 (0.34)
UPPS-P Negative Urgency	3.18 (0.74)
Total SHBQ Scores	24.21 (15.55)
Mental Pain Scale	122.15 (34.57)
Self-Esteem Scale	25.01 (6.52)
RFL-A Future Optimism Subscale	4.74 (1.22)
Number of Stressful Events	19.87 (13.07)

levels of distress and urges for self-harm. The SSF was then administered in the traditional side-by-side style as outlined in CAMS, with the researcher guiding the adolescent through completion of the form. The researcher then administered a battery of self-report measures to participants and lastly administered the death/suicide implicit association test via laptop computer. Adolescents were again assessed with the UWRAP to determine postassessment levels of distress and urges to self-harm. Adolescents with significant increases in distress or self-harm risk were referred to staff clinicians for follow-up. Participants received a \$20 gift card for their

time, which was given to them upon discharge by staff.

Measures

Demographics. Demographic information included age, education level (grade), gender, sexual orientation, religious affiliation, ethnicity, parental marital status, living situation, list of siblings or step-siblings, height, weight, and bullying frequency or type (threatening, pictures, rumors).

Suicide Status Form-4 (SSF-4). The SSF-4 is comprised of a “core” of assessment items reflecting three theories of why individuals develop suicidal thoughts and behaviors, namely the Cubic Model of Suicide (Shneidman, 1987), Cognitive Theory of Suicide (Wenzel & Beck, 2008), and Escape Theory of Suicide (Baumeister, 1990). On the SSF, Psychological Pain, Stress, and Agitation are single items that correspond to the Cubic Model, the Hopelessness item corresponds to the Cognitive Theory of Suicide, and the Self-Hate item corresponds to the Escape Theory of Suicide. Patients are asked to report the degree to which they experience these 5 core SSF items on a 1- to 5-point Likert scale followed by open-ended responses about each item. Additionally, patients are asked to rate their self-perceived Overall Risk of Suicide with one item on a 1- to 5-point Likert scale. Although there are additional sections to the SSF, the current study is investigating only the psychometric properties of the quantitative responses to the 5 core items and self-perceived Overall Risk of Suicide item from the SSF. The SSF has demonstrated strong criterion and convergent validity in previous studies with adult samples (Conrad et al., 2009; Jobes et al., 1997). The internal consistency for the core variables was good in the current sample of adolescents ($\alpha = 0.77$).

Psychological Pain. The Orbach and Mikulincer Mental Pain Scale (OMMP; Orbach, Mikulincer, Sirota, & Gilboa-Schechtman, 2003) was used to assess the construct of Psychological Pain. The OMMP is a 44-item measure that assesses aspects of mental pain on a 5-point Likert scale. The

scale includes multiple subscales that assess experience of irreversibility, loss of control, narcissistic wounds, emotional flooding, freezing, estrangement, confusion, social distancing, and emptiness. The OMMP has shown good internal consistency ($\alpha = 0.78\text{--}0.95$) and test–retest reliability ($r = 0.79\text{--}0.94$). The current study showed reliability of 0.96. Items are summed for a total scores, and higher scores are indicative of greater severity of mental pain (Orbach et al., 2003).

Stress. The Adolescent Perceived Events Scale (APES; Compas, Davis, Forsythe, & Wagner, 1987) was used to assess the construct of Stress. The APES is a 90-item measure of stressful events for adolescents (aged 10–18). Adolescents indicate if they have experienced any of the 90 events in the past 6 months, and if they have, they rate that event from -4 (extremely bad) to $+4$ (extremely good). Examples of events are parents getting divorced, receiving poor grades, and changes in relationships with friends or romantic partners. One common scoring method for this measure, as outlined in Wagner and Compas (1990), is to use a simple count of events rated as negative. Thus, all events that were rated as negative by participants (those with ratings from -4 to -1) were coded as negative (1) and summed for a total number of negative events reported. The measure has demonstrated high test–retest reliability ($\alpha = 0.74\text{--}0.89$; Compas et al., 1987).

Agitation. The Urgency Premeditation Perseverance Sensation Seeking-Positive Urgency Impulsive Scale (UPPS-P; Lynam, Smith, Whiteside, & Cyders, 2006) was used as an additional measure of Agitation. The UPPS-P is a 59-item multifaceted scale that assesses personality traits related to impulsivity and rash actions. The scale consists of five subscales: sensation seeking, lack of deliberation, lack of perseverance, negative urgency, and positive urgency. The negative urgency subscale was used in the current study, which assesses the tendency to act rashly under extreme negative emotions, and has been found to correlate with other measures of impulsiveness and inhibitory control (Whiteside & Lynam, 2001). Although the UPPS-P

was designed to assess traits, and the Agitation item on the SSF-4 assesses a more state-specific level of Agitation, similar measures have been used in past SSF validation studies as a proxy measure of Agitation (Conrad et al., 2009). Both high negative urgency and Agitation have been found to associate with suicide behavior (Busch, Fawcett, & Jacobs, 2003; Klonsky & May, 2010). This subscale is made up of 12 items (ex. “It is hard for me to resist acting on my feelings”), and items were rated on a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*very much*). Reverse coding is used to scale all items in the same direction, and the mean is calculated for the subscale. Higher scores indicate greater negative urgency. The UPPS-P has been shown to have good convergent and discriminant validity (Cyders & Smith, 2007; Smith et al., 2007), and internal consistency for the negative urgency scale has been good ($\alpha = 0.88$; Cyders & Smith, 2007). Internal consistency for the current study was also good ($\alpha = 0.82$).

Hopelessness. The Reasons for Living Inventory for Adolescents (RFL-A) was used to assess the construct of Hopelessness. The RFL-A is a 32-item measure that asks participants to rate the importance of reasons for why they would not kill themselves on a six-point Likert scale (Osman et al., 1998). Subscales include Family Alliance, Peer Support, Self-Acceptance, Future Optimism, and Suicide-Related Concerns. The Future Optimism subscale was used to measure Hopelessness and includes items such as “The future looks promising.” The mean scores for the subscale are calculated, and higher scores indicate greater hope for the future, while lower scores indicate less hope. In the initial validation study of the RFL-A, the future optimism scale was found to have a significant negative correlation with the Beck Hopelessness Scale (BHS; Beck, Weissman, Lester, & Trexler, 1974). Overall, the RFL-A has shown strong internal consistency ($\alpha = 0.89\text{--}0.97$) and test–retest reliability ($\alpha = 0.70$); internal consistency for the future optimism scale is also strong ($\alpha = 0.91\text{--}0.94$; Gutierrez, Osman, Kopper,

& Barrios, 2000; Osman et al., 1998). For the current study, the future optimism subscale had excellent reliability ($\alpha = 0.94$).

Self-Hate. The Rosenberg Self-Esteem Scale (SES; Rosenberg, 1965) was used to assess the construct of Self-Hate. The SES is a brief 10-item measure of global self-esteem on a 4-point Likert scale with higher scores indicating higher self-esteem. The SES has been found to demonstrate high internal consistency ($\alpha = 0.77$ – 0.88) and test–retest reliability ($\alpha = 0.82$ – 0.88) (Rosenberg, 1965). The SES has been found to negatively correlate with measures of depression and anxiety and positively correlate with other measures of self-esteem (Rosenberg, 1965). Reliability for the SES in the current sample was good ($\alpha = 0.88$).

Overall Suicide Risk. The Self-Harm Behavior Questionnaire (SHBQ; Gutierrez, Osman, Barrios, & Kopper, 2001) was used to measure overall suicide risk. The SHBQ gathers descriptive information regarding history of suicide attempt and nonsuicidal self-injury, as well as suicidal threats and gestures. The three subscales pertaining to suicide were used for the current study: Suicide Attempt, Suicide Threats, and Suicide Ideation. Each section asks if individuals have ever made a suicide attempt, suicide threat, or had thoughts about suicide. If they endorse any of these, each section contains follow-up questions measuring features of the suicide behavior such as the methods used, frequency and intent of the behavior, and whether medical attention was needed. Free-response items are coded and weighted by the seriousness of the behavior reported to provide a single numerical value for each item that can be used in statistical analyses. Scores from these three subscales were summed for a total score, with higher scores indicating greater suicide risk. The measure has demonstrated high internal reliability for each of its clinical subscales ($\alpha = 0.89$ – 0.96) and strong convergent validity with other measures of suicidal ideation and behaviors (Gutierrez et al., 2001). Internal consistency for the suicide behaviors total score in the current study was good ($\alpha = 0.89$).

Implicit Suicide Risk. The death/suicide implicit association test (d/s IAT; Nock et al., 2010) was used to assess implicit suicide risk. The d/s IAT is a computer-based categorization task that assesses individuals' automatic mental associations they hold about death/suicide and life. The task measures how long it takes an individual to categorize words associated with each of the following four categories: *death/suicide*, *life*, *me*, and *not me*. The categorization task is completed under two conditions. In the first condition, words representing *death/suicide* and *me* are categorized using the same response key, and words representing *life* and *not me* are categorized using an alternative response key. In the second condition, words representing *death/suicide* and *not me* are categorized using the same response key, and *life* and *me* are categorized using an alternative response key. Responses are speeded when the combined categories are strongly associated with memory (Nock et al., 2010). All participants complete both conditions. Negative scores indicate individuals responded faster when *death/suicide* and *me* are paired together and have a stronger association of self with *death/suicide* relative to *life*. Positive scores indicate individuals responded faster when *life* and *me* are paired together and have a stronger association of self with *life* relative to *death/suicide*. The participant is instructed to sort the words as quickly and accurately as possible, while making as few mistakes as possible. Reaction times to classify words in the *death or me* and *life or me* categories were recorded in milliseconds and analyzed using the standard IAT algorithm (Greenwald, Nosek, & Banaji, 2003) to calculate a net difference d/s IAT score. The IAT (Greenwald, McGhee, & Schwartz, 1998) has been shown to have strong reliability of Cronbach's $\alpha = 0.78$ (Cunningham, Preacher, & Banaji, 2001; Greenwald & Nosek, 2001) and construct validity (Lane, Banaji, Nosek, & Greenwald, 2007).

Statistical Analyses

Prior to testing hypotheses, all variables were checked for normality and found

to be normally distributed. The n sizes differed slightly across variables due to invalid or missing data. Some participants skipped items or declined to finish all measures in the research protocol. Participants with complete data were included in respective analyses; missing data were minimal and ranged from 0 to 11 on variables of interest. The n size for the d/s IAT scores was lowest due to number of missing or invalid scores ($n = 20$). Participants with excessive errors of commission or omission and/or excessive response times are scored as invalid and do not produce valid d-scores.

Factor Analysis. A confirmatory factor analysis (CFA) approach was taken to measure the dimensionality of the core SSF items given that two previous exploratory analyses of the instrument have already been conducted in previous studies (Conrad et al., 2009; Jobes et al., 1997). As noted, the SSF has been shown to have two separate factors, which were labeled as “acute” and “chronic” by Conrad et al. (2009). These labels were applied based on theory and results from the study by Jobes et al. (1997) which found certain factors to better predict which patients would quickly resolve their suicidal crises (“acute resolvers”) and those who did not resolve after many sessions (“chronic nonresolvers”). We were interested in the extent to which the adolescent data would replicate the factor structure in adults and college students, and so examined several models to determine that with the best fit. We utilized the “sem” function in Stata version 13 (StataCorp, 2013) to conduct the analyses and reviewed goodness-of-fit statistics, including established cut points for the likelihood ratio ($p > 0.05$), Comparative Fit Index (≥ 0.90), root mean square error of approximation (≤ 0.05), and standardized root mean square residuals (≤ 0.08), to guide decision making (Hu & Bentler, 1999).

Validity. To test for concurrent validity of the SSF core constructs, Spearman correlations used between the six core construct ratings and total scores from psychometrically validated self-report measures of same constructs. The overall suicide risk rating

from the SSF was correlated with both a self-report measures (SHBQ) and an implicit measure (d/s IAT), also using Spearman’s correlation.

Between Group Comparisons. Criterion validity was examined using MANOVA to test for differences between adolescents with and without prior suicide attempts on the six core SSF constructs. See Table 1 for descriptive statistics on all variables of interest.

RESULTS

Factor Analysis

Eleven participants who reported a total score of 0 on the SHBQ, indicating no history of suicidality or NSSI, were removed from the CFA analyses. This is consistent with the previous SSF psychometric analyses that were based upon suicidal samples (Conrad et al., 2009; Jobes et al., 1997). Given the wide range of suicidality in the current sample (i.e., suicidal ideation several years ago as compared to a recent suicide attempt that led to hospitalization), we also included overall SHBQ total score as a covariate in the model. The initial CFA model (Model 1) was structured to match the factor structure of the SSF in Conrad et al. (2009) with Psychological Pain, Hopelessness, and Self-Hate grouped into one latent factor, while Stress and Agitation were group into a separate factor. As seen in Table 2, this model did not demonstrate adequate fit. Review of the correlation matrix for all five SSF core variables indicated that Psychological Pain had the strongest correlation with Stress ($r = 0.54$), whereas Hopelessness was most strongly correlated with Self-Hate ($r = 0.60$). Therefore, a second model (Model 2) was analyzed that included Psychological Pain in the second factor with Stress and Agitation, which led to a much improved fit with the data (see Table 2). A final CFA model (Model 3) that utilized a single-factor structure was analyzed to ensure that a two-factor model provided optimal fit, which was indeed indicated from the results (see Table 3).

TABLE 2
Fit Statistics for Suicide Status Form Confirmatory Factor Analysis Models

Model	Likelihood Ratio	<i>p</i>	CFI	RMSEA	SRMR
Model 1	18.61	0.009	0.888	0.137	0.047
Model 2	8.28	0.31	0.988	0.045	0.031
Model 3	19.70	0.02	0.897	0.116	0.050

Model 1 included two factors comprised of Psychological Pain, Hopelessness, and Self-Hate (Factor 1), and Stress and Agitation (Factor 2). Model 2 included two factors comprised of Hopelessness and Self-Hate (Factor 1), and Psychological Pain, Stress, and Agitation (Factor 2). Model 3 included a single factor comprised of Psychological Pain, Hopelessness, Self-Hate, Stress, and Agitation.

CFI, Comparative Fit Index; RMSEA, root mean squared error of approximation; SRMR, standardized root mean squared residual.

Convergent Validity

Spearman correlations between core SSF constructs and measures of similar constructs were almost all significant. Pain, Agitation, Hopelessness, and Self-Hate all significantly correlated with their respective measures, with most being significant at the 0.01 level. Stress was the only construct that did not reach significant in its correlation, but was approaching significance ($p = 0.06$). Overall Risk of Suicide was significantly correlated with both self-reported suicide risk (SHBQ) and implicit suicide risk (d/s IAT). See Table 4 for full correlation results. All of the core SSF constructs (Psychological Pain, Stress, Agitation, Hopelessness, and Self-Hate) were significantly correlated with measures of similar constructs, showing evidence for concurrent validity. Furthermore, self-

rated Overall Suicide Risk on the SSF was significantly correlated with both self-reported suicide thoughts and behaviors ($r = 0.41$, $p < 0.0001$) and implicit suicide risk measured by the death/suicide IAT ($r = 0.35$, $p < 0.05$).

Criterion Validity. In our total sample ($n = 100$), almost exactly half reported a past suicide attempt ($n = 49$; 49%). The majority of suicide attempts (71.4%) were coded as harm/injury or traumatic/lethal on the SHBQ, meaning they involved methods such as severe cutting or stabbing, hanging, and jumping from height. The remaining suicide attempts were coded as involving an overdose of substances. Among those with suicide attempt history ($n = 49$), less than half reported one past suicide attempt (41%), while 16.7% reported two, 8.3% reported three, and 33.3% reported four or more past suicide attempts. The majority of adolescents with a past suicide attempt reported that it occurred within the past year (84%). About 10% reported that their attempt occurred between 1 and 2 years ago, and only 6% reported that their attempt was more than 2 years ago. When asked if they actually wanted to die during their attempt(s), 85% said yes. In terms of other suicide behaviors, among the total sample ($n = 100$), 78% reported lifetime suicide ideation and 70% reported any previous suicide-related communication.

One-way MANOVA results comparing adolescents with and without suicide

TABLE 3
Standardized Coefficients for Best-Fitting Suicide Status Form CFA Model

Variable	Latent Construct	β	SE	<i>p</i>
Hopelessness	Chronic	0.64	0.09	<0.000
Self-Hate	Chronic	0.88	0.10	<0.000
Psychological Pain	Acute	0.72	0.09	<0.000
Stress	Acute	0.76	0.09	<0.000
Agitation	Acute	0.27	0.11	0.02

CFA, confirmatory factor analysis.

TABLE 4
*Convergent Validity: Spearman Correlations
 Between SSF-IV Core Constructs and Measures
 of Similar Constructs*

SSF-IV Item	Measure	<i>n</i>	Spearman rho
Pain	Mental Pain Scale	93	0.47**
Stress	Adolescent Perceived Events Scale	100	0.19
Agitation	UPPS-P Negative Urgency	89	0.26*
Hopelessness	RFL-A Future Optimism	99	-0.49**
Self-Hate	Rosenberg SES	94	-0.65**
Overall Suicide Risk	SHBQ	94	0.40**
	d/s IAT	80	0.28*

** $p < 0.01$.

* $p < 0.05$.

attempt history found significant differences on several SSF-IV items. Adolescents with suicide attempt history reported significantly higher scores on Psychological Pain, Hopelessness, Self-Hate, and Overall Risk of Suicide. Significant differences were not found on Agitation or Stress. See Table 5 for full one-way MANOVA results.

DISCUSSION

Results from the confirmatory factor analyses partially replicated the two-factor structure of the SSF found in previous research conducted using an adult psychiatric sample (Conrad et al., 2009). Comparison of fit indices indicated a two-factor solution was superior to a one-factor solution, providing additional evidence that the SSF may distinguish between elements of suicidality that could be acute or chronic in nature. However, model fit was achieved by allowing the Psychological Pain item to load onto the acute factor despite previous

research indicating its loading onto the chronic factor (Conrad et al., 2009). Additionally, model fit indices indicated the factor structure identified in the previous adult sample fit no better than a one-factor structure for the present sample.

Results support the use of the SSF to capture the current experience of suicidal adolescents. In prior research, canonical correlation analyses using these factors were able to correctly identify 71%–72% of individuals as either acutely or chronically suicidal (Conrad et al., 2009; Jobes et al., 1997). Of these two groups, deemed “acute resolvers” and “chronic nonresolvers,” the latter were less likely to resolve their suicidality during the course of treatment. Further research on the use of the SSF with adolescents who are receiving treatment may be able to confirm if suicidal adolescents also fit into similar subtypes. The present findings also indicate that the latent construct of suicidality is multidimensional, with current findings showing Hopelessness and Self-Hate loading on one dimension, and Psychological Pain, Stress, and Agitation loading on another. However, Conrad et al. (2009) identified Psychological Pain as indicative of chronic suicidality in adults in a psychiatric inpatient unit. This measurement variance is undoubtedly due to characteristics of the adolescent sample. Adolescents’ who are experiencing acute suicidality may rate Psychological Pain higher because this is a more psychologically painful phenomenon to those who are more attuned to the present moment. This experience may be due to decreased ability to regulate emotions and tolerate distress in adolescents, and the tendency for painful emotions to fluctuate and feel more transient than constant (Casey, Jones, & Hare, 2008). On the other hand, for adults with chronic suicidality, the longevity of their suicidality may register as a much more psychologically painful experience. It is also possible that the Psychological Pain item is too abstract for this population to accurately answer and that these results are due to chance. The present factor structure results will need replication in future studies.

TABLE 5

One-Way MANOVA Results Comparing Adolescents with and Without Suicide Attempt History on SSF-IV Items

SSF Item	Suicide Attempt History (<i>n</i> = 49)		No History (<i>n</i> = 51)		<i>F</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Pain	2.76	1.30	2.14	1.09	6.63	0.012
Stress	2.94	1.51	2.43	1.45	2.96	0.089
Agitation	2.00	1.31	1.71	1.08	1.51	0.223
Hopelessness	2.82	1.58	2.04	1.17	7.90	0.006
Self-Hate	3.24	1.59	2.20	1.31	13.01	<0.001
Overall risk	2.16	1.21	1.23	0.63	22.54	<0.001

The content of the current study's two-factor structure may shed light on the cause for the discrepancy between earlier attempts to analyze the factor structure of the SSF (i.e., Conrad et al., 2009; Jobes et al., 1997). Although the adult sample (mean age of 35; Conrad et al., 2009) returned a relatively strong two-factor solution, Jobes et al. (1997) cited low eigenvalues, communalities, and variance explained by their model as reasons for asserting each SSF item as its own construct when analyzing the SSF in an undergraduate sample of emerging adults (mean age of 22). It is worth noting that the highest correlations among SSF items in the emerging adult sample are between Agitation and Stress, Agitation and pain, and Agitation and Self-Hate. Although all these correlations were in the medium range, this pattern is closer to the results from the current study than to the factor structure identified by Conrad et al. (2009). It is possible the emerging adult sample returned a weak factor solution because the participants were a mixture of two groups whose suicidality would be better captured by either the present study's factor structure or the one produced by Conrad et al. (2009).

Results indicating a two-factor structure further support the ideation-to-action framework of suicidality which highlights the existence of both long-standing suicide risk factors and acute warning signs for imminent suicide (Klonsky & May, 2014; Rudd et al., 2006). Findings from the current study

identify Stress, Agitation, and Psychological Pain as possible warning signs for adolescent suicide risk, whereas Self-Hate and Hopelessness are potential long-term risk factors. The SSF's ability to identify adolescents who are at higher risk to remain chronically suicidal throughout and after treatment provides clinicians with a tool to inform follow-up procedures and intervention delivery. Jobes et al. (1997) found chronic nonresolvers to be at increased risk for reporting suicidal thoughts after finishing treatment, so increased follow-up assessment may be necessary for adolescents reporting Self-Hate and Hopelessness. This is particularly important in this population because intervening with adolescents at high risk for chronic suicidality may have downstream preventative effects in later life. Unfortunately, the present study does not include treatment outcomes or follow-up data, so future longitudinal research with adolescent samples will need to confirm the increased likelihood of chronic nonresolvers to exhibit suicide ideation postintervention.

Results of correlations between SSF items and similar constructs measured by developmentally appropriate assessments indicated all SSF items demonstrated convergent validity with the exception of the SSF Stress item. These findings replicate the convergent validity demonstrated by the SSF in adults (Conrad et al., 2009). Results support the SSF as clinically useful for quickly assessing current levels of adolescents' mental pain, Agitation, Hopelessness, Self-Hate,

and overall suicide risk. It is worth noting that the SSF overall suicide risk item was correlated with suicide risk as measured by both past history of suicide ideation and behaviors as well as implicit bias toward suicide-related stimuli. Both past suicidal behavior and implicit bias have been found to prospectively predict suicide attempts beyond the ability of other, commonly studied risk factors (Nock et al., 2010; Ribeiro et al., 2016).

There are multiple explanations for why SSF Stress did not demonstrate convergent validity as indicated by its nonsignificant associations with the concurrent measure of Stress (APES; Compas et al., 1987) and history of suicide attempt. The timeline of the APES is not specific to the current hospitalization. SSF Stress assesses current perceptions of feeling pressured or overwhelmed in the moment of administration, whereas the APES assesses number of stressors and intensity of Stress over the course of the past 6 months. Similarly, Conrad et al. (2009) found this item to demonstrate convergent validity only with adult measures of Stress that assessed state and trait Stress. Conrad et al. (2009)'s Stress item was not correlated with a measure that resembles the APES (the Pressure Inventory-III; Weiten, 1988), which inquires about participants' experience of multiple types of stressful life experiences. Given the consistency of the current results with Conrad et al. (2009), it is likely that the SSF Stress item is more specific to recent Stress and is less affected by temporally distant stressful life experiences. There was, however, a signal indicating SSF Stress was trending toward significance, so future research should assess the convergent validity of this item using measures that capture assess more recent Stress and larger sample sizes.

Criterion validity of the SSF was evaluated by assessing group differences on SSF scores between adolescents with and without a history of suicide attempts. Adolescents with a history of one or more suicide attempts had elevated scores on the SSF items pain, Hopelessness, Self-Hate, and overall suicide risk. These results demonstrate the criterion validity of the SSF because prior research has

found these constructs to be elevated in adolescents with a history of one or more suicide attempts (Bridge, Goldstein, & Brent, 2006; Gutierrez et al., 2001). These results largely mirror those obtained in an adult sample, despite Conrad et al.'s (2009) use of a different criterion (presentation to a psychiatric inpatient unit with or without current suicidal ideation/behaviors).

However, in the present study pain was found to distinguish between adolescents with and without suicide attempts, whereas it did not distinguish between adults (Conrad et al., 2009). This difference is surprising because pain was the only item that loaded onto the acute suicidality factor that also distinguished between adolescents with and without suicide attempts. Conrad et al. (2009) also found this item to function atypically. Although pain loaded onto the chronic factor in adults, it did not distinguish between those presenting with and without suicidal ideation/behaviors in the same way as other chronic factors (Conrad et al., 2009). It is difficult to speculate on the reasons for this difference when it is impossible to determine whether it is due solely to the sample differences or the criterion used. Future studies will need to assess both criteria to evaluate and determine possible reasons.

In addition to nonsignificant group differences for the SSF Stress item, the Agitation construct also did not have significant differences. Some possible reasons for this may actually be related to the nature of an inpatient environment. Participants were interviewed by a researcher in a private room within the crisis stabilization unit, and noises from within the unit at times could be heard. In addition, typical qualitative responses of participants in regard to their current acute Stress and Agitation focused on the external circumstances related to the stabilization unit. For example, participants sometimes expressed distress about being removed from their homes, or the uneasiness associated with a lack of control regarding discharge. Therefore, it is possible that participants with both suicidal and nonsuicidal histories were experiencing similar levels of acute Stress and Agitation due to the overwhelming experiences

related to their stay in a crisis unit. Future research should attempt to differentiate between shared Stress (similar environmental circumstances of both suicidal and nonsuicidal groups) and nonshared Stress by comparing scores of adolescents in inpatient and outpatient settings.

Limitations

One limitation of this study is the lack of ethnic diversity within the sample (80% of the sample identified as Caucasian). Although the SSF has been translated into a variety of languages (Jobes, 2012), future research should extend validation of the SSF form with adolescent racial and ethnic minorities. In addition, this study was conducted utilizing an inpatient sample, limiting generalizability to outpatient or nonclinical samples. Future studies should attempt to replicate these findings with more diverse groups of adolescents in regard to ethnic and cultural diversity, sexual orientation and gender identity, and treatment setting.

Further, this study included a retrospective assessment of self-reported suicide attempts, which limits findings to cross-sectional analyses and conclusions. The SSF was designed to assess *current* and near-future (prospective) suicide risk, as opposed to retrospective risk. Although this study provides initial validation for use of the SSF with adolescents, future work is needed in order to determine whether the SSF is a useful tool for determining near-future risk for this age group. These studies would help to improve the validation of the actual clinical utility of the SSF with adolescents. Additionally, while the current study tested multiple aspects of validity regarding the SSF, only one form of reliability was able to be tested (internal consistency).

Future studies should evaluate additional aspects of reliability for the SSF in adolescent samples, such as test–retest reliability.

Lastly, participants provided self-reported accounts of suicide attempts and current subjective mental pain, Agitation, Stress, overall suicide risk, and reasons for living. Although relying on self-report may introduce social desirability bias or errors of recall, multimethod assessment of overall suicide risk and multimeasure assessment of the core CAMS constructs are a strength. Notably, the implicit measurement of overall suicide risk is an important element for validating self-report. The death/suicide IAT has been shown to successfully differentiate between those with a history of suicide and those without, as well as determining risk for prospective suicide attempting within an adult inpatient sample (Nock et al., 2010).

Results of this study provide initial psychometric validation of the SSF for use with adolescents in clinical settings. Core SSF constructs were highly correlated with concurrent measures, providing evidence that adolescents are understanding and accurately responding to the SSF in its current form. The factor structure of the SSF was found to be very similar to results from the adult SSF psychometric study (Conrad et al., 2009), and adolescents with suicide attempt history scored higher on almost all of the core CAMS constructs than those with no attempt history. Initial results indicate that clinicians and researchers can be confident in the use of the Suicide Status Form for adolescents between the ages of 12–17. These results lay the foundation for future research on the efficacy and effectiveness of CAMS as a treatment framework for suicidal adolescents.

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