

# Extending the Concurrent Validity of the Self-Injurious Thoughts and Behaviors Interview to Inpatient Adolescents

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**Abstract** The Self-Injurious Thoughts and Behaviors Interview (SITBI) was created to address limitations in existing suicide assessments and its validity was evaluated in the original publication. However, this work has not yet been extended to inpatient adolescents, a population in which suicide assessment is crucial. Moreover, information on the psychometric properties of the SITBI has not been provided by other groups beyond the developers of the SITBI. The aim of this study was to examine the concurrent validity of the suicide ideation, attempt, plan, and gesture modules of the SITBI with inpatient adolescents ( $N=106$ , 64.8 % female,  $M_{age}=14.63$ ), as an extension to previous validation efforts using this measure. Concurrent validity was examined with established interview-based and self-report measures of suicide ideation and suicide intent. The SITBI demonstrated adequate agreement with other measures, suggesting adequate validity for the suicide ideation, attempt, plan, and gesture modules in a sample of inpatient adolescents.

**Keywords** Suicide · SITBI · Suicide ideation

## Introduction

Research in suicide related thoughts and behaviors (SRTB; i.e., suicide-related ideations, communications, and behaviors) among adolescents has attracted a great deal of scholarly interest because of the devastating consequences and social costs associated with completed suicide in this age group. Specifically, completed suicide is the fifth leading cause of death among children and young adolescents and the third

leading cause of death among older adolescents and young adults (Xu et al. 2010). Further, suicide-related ideations (Kachur et al. 1995) and suicide-related communications (like making gestures and plans) have been identified as predictors of future suicide attempts and for that reason, are important aspects of suicide prevention research. The *assessment* of SRTB is a particularly important area within the wider SRTB literature because thorough assessment can help identify individuals at risk and, more generally, contribute to a growing body of literature seeking to better understand and address SRTB. Furthermore, SRTB assessment in clinical samples is a key piece of patient safety, goal formulation, case conceptualization, and treatment planning (Klonsky and Weinberg 2009) and, thus, warrants attention from researchers seeking to improve and validate existing instruments.

Nock et al. (2007), making use of two reviews of SRTB assessment tools commissioned by the National Institute of Mental Health (Brown 2000; Goldston 2000), identified a number of limitations in existing SRTB assessments. Among these, they highlighted the confusion and difficulty posed by inconsistent language and operationalization of SRTB in assessments. In addition to complicating administration, definitional vagueness also affects the ability to compare across studies and accurately estimate the prevalence of SRTB. Specifically, the authors, drawing from previous work (Nock and Kessler 2006), noted that the prevalence of suicide attempts in the National Comorbidity Survey dropped from 4.6 to 2.7 % when intent to die was considered an essential aspect of the suicide attempt definition, highlighting the importance of precise definitions in this field. Another limitation noted by Nock et al. (2007) is the difficulty of interpreting existing assessments because they are rated on somewhat arbitrary scales, rather than capturing easily interpretable data such as the presence and frequency of various SRTB.

In light of these limitations in SRTB assessments, Nock and colleagues (2007) developed the Self-Injurious Thoughts

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and Behaviors Interview (SITBI), a structured interview that assesses the prevalence, frequency, intensity, and other characteristics of various SRTB. The measure attempts to follow a clear and consistent nomenclature. Specifically, the SITBI and the present study define suicide ideation as ever having “thoughts of killing yourself” (Nock et al. 2007; p. 1), suicide plan as having “actually made a plan to kill yourself” (p. 3), suicide gesture as having “ever done something to lead someone to believe that you wanted to kill yourself when you really had no intention of doing so” (p. 5), and suicide attempt as having “ever made an actual attempt to kill yourself in which you had at least some intent to die” (p. 7). These modules of the SITBI correspond to the taxonomy of Silverman and colleagues (Silverman et al. 2007a, b) as follows: the SITBI suicide ideation module corresponds to Suicide-Related Ideations (with or without suicidal intent); the SITBI suicide plans module corresponds to Suicide Plan I, II, and III; the SITBI suicide gesture module corresponds to Suicide Threat I; and the SITBI suicide attempts module corresponds to Suicide Attempt I and II, in which there is at least some degree of suicidal intent.

In the original publication of the measure (Nock et al. 2007), the SITBI demonstrated adequate interrater reliability, test–retest reliability, and concurrent validity in a sample of adolescents and young adults recruited through outpatient psychiatric clinics and newspapers. The SITBI has since been used in several studies with community and outpatient adolescents and young adults (Deliberto and Nock 2008; Janis and Nock 2008; Muehlenkamp et al. 2010; Nock and Mendes 2008; Nock et al. 2009; Weierich and Nock 2008). However, the psychometric properties of this measure have not yet been evaluated in inpatient adolescents and have not been validated by a group other than the developers of the measure.

Undoubtedly, the assessment of SRTB in inpatients is a major concern, given the prevalence of SRTB among inpatients and the clinical utility of identifying and conceptualizing SRTB during inpatient treatment. Moreover, investigating the psychometric properties of the SITBI in this population is a valuable step in extending the SITBI’s evidence base to a group with notably more psychopathology and past SRTB than outpatient or community samples. More specifically, an inpatient sample is useful because the elevated probability of adverse events allows for more precise assessment of correlations between the SITBI and other established measures. Specifically, a sample with more “true positive” SRTB should provide more precise estimates of the SITBI’s ability to detect suicide ideation, plans, gestures, and attempts. Additionally, exploring the SITBI in an inpatient sample, different from the initial validation sample, is important because the psychometric properties of a measure are known to vary across samples (e.g., Sharp et al. 2006) and one cannot assume that a given measure soundly assesses what it was developed to assess under all clinical assessment circumstances. Indeed, Hunsley and Mash

(2007) note that one of the three critical aspects of establishing an evidence-based assessment is acknowledging that psychometric evidence is *conditional on the sample and assessment purpose* in question and, therefore seeking a range of replicated reliability and validity evidence. By the same token, Nunnally and Bernstein (1994) emphasize that validity relates specifically to a particular use of a specific measuring instrument. In other words, an instrument can be valid for assessing SRTB among outpatient and community young adults but not for assessing SRTB among inpatient adolescents, in whom SRTB is much more prevalent and severe.

Against this background, the aim of the present study was to extend Nock et al.’s (2007) work to inpatient adolescents by assessing the concurrent validity of the SITBI suicide ideation, gesture, plan, and attempt modules in a sample of inpatient adolescents. Concurrent validity was evaluated using established, interview-based measures of suicide ideation and suicide intent, the Modified Scale for Suicide Ideation (MSSI; Miller et al. 1986) and the Suicide Intent Scale (SIS; Beck et al. 1974), respectively. Additionally, an item from the self-report Beck Depression Inventory II (BDI-II; Beck et al. 1996), assessing intensity of suicide ideation, was used. In addition, the prevalence of suicide ideation, gesture, plans and attempts in this sample was compared with the sample in the original publication (Nock et al. 2007), in order to bolster rationale for separately evaluating the validity of this measure among inpatients in future research. Finally, a racially and ethnically diverse adolescent sample was recruited—a sample substantially different from the original validation study—given the importance of considering developmental differences and racial/ethnic diversity in developing the evidence base for an assessment (Hunsley and Mash 2007).

We expected moderate agreement between the MSSI, BDI-II, and SITBI because these measures differ in some important regards (e.g., time period assessed and mode of administration). We expected that comparisons with a mixed outpatient and community sample described by Nock et al. (2007) would reveal significantly higher SRTB in the present sample in most regards, with the most substantial differences in *recent* SRTB, since this is common cause for inpatient hospitalization.

## Methods

### Participants

One hundred seventy-nine consecutive admissions to the 16-bed adolescent unit of a county psychiatric hospital were approached for consent on the day of admission. The psychiatric hospital from which adolescents were recruited is an urban county facility in the South Western United States and approximately 75 % of the adolescents served are considered

indigent. The average length of stay on the adolescent unit is 7 days. Parents were given the opportunity to consent in either English or Spanish and, following parent consent, adolescents were approached for assent. Because the study procedures required English fluency, adolescents were only given the opportunity to consent in English. Of those approached, 9 declined, 40 were discharged prior to completion of the assessments, 3 began assessments and then revoked consent, and 19 were excluded from the study. Inclusion criteria were English fluency, age between 12 and 17, and voluntary admission to the hospital. The exclusion criterion adopted was psychiatrist-determined capacity to participate in research. Adolescents with severe psychosis, mental retardation, and those who posed a physical danger to research assistants (i.e., those with a prior history of assault or recent threats towards staff members) were not determined to have adequate capacity. Therefore, the sample was reduced to 108 adolescents. Protocols of two additional participants were excluded because of missing data (i.e., they had not completed the MSSSI and/or had missing data on the SITBI), resulting in a sample of 106 adolescents with complete data. 64.8 % of the sample ( $n=68$ ) was female and the average age was 14.63 years ( $SD=1.40$ ). The sample was ethnically diverse and the breakdown was as follows: 39.0 % Hispanic, 32.4 % African-American, 24.8 % White, 2.9 % Multiracial, and 1.0 % who identified as “Other.”

## Procedures

The study was approved by the appropriate institutional review board. All assessments were conducted in private by doctoral psychology students (ranging in seniority from the first to the fourth year in a doctoral clinical psychology program). Students completed mandatory training with the hospital and training in ethics and human subjects prior to beginning training on the study protocol. Students were trained on assessment procedures by first observing 2–3 cases completed by the principle investigator or a senior student previously trained in the measures required. Each student was then observed while administering the assessments until they were determined competent to do so alone (2–3 cases). In order to maintain fidelity throughout data collection, the principal investigator periodically attended a data collection session and offered feedback. Assessments were conducted within 2 to 3 days of admission ( $M=2.46$  days,  $SD=1.56$ ) and participants were awarded a \$30 gift card to a nationwide department store for their participation in the study.

## Measures

### *Self-Injurious Thoughts and Behaviors Interview*

The Self-Injurious Thoughts and Behaviors Interview (SITBI; Nock et al. 2007) was administered to adolescents, in private, by graduate research assistants in order to assess many

features of SRTB. In total, the SITBI contains 169 items divided into six modules: suicide ideation, suicide gesture, suicide plan, suicide attempt, non-suicidal self-injury, and thoughts of non-suicidal self-injury. In this study, the concurrent validity of the suicide ideation, gestures, plans, and attempts modules of the SITBI was evaluated. Dichotomous variables assessing the presence of suicide ideation, gestures, plans, and attempts over the adolescent’s life were created. The first question of the SITBI, “Have you ever had thoughts of killing yourself?” was used to create two groups based on the presence of suicide ideation. Similarly, dichotomous variables based on the presence of lifetime suicide plans, gestures, and attempts were created. These variables were permitted to overlap, with adolescents being represented in several categories in some instances.

Furthermore, continuous variables assessing the lifetime frequency of each SRTB were created by asking questions like “During how many separate times in your life have you had thoughts of killing yourself? (Please give your best estimate)” for each SRTB. Following the procedure used by Nock and Mendes (2008) and Nock et al. (2009) the frequency of SRTB was capped at 500 to limit the effect of extreme outliers on data analyses.

Finally, the intensity of suicide ideation, assessed in the SITBI using the question “On average, how intense were these thoughts?” and rated on a 5-point scale ranging between 0 (“low/little”) and 4 (“very much/severe”) was compared with other sources of report. The SITBI only includes a rating of intensity for suicide ideation.

The SITBI has previously demonstrated good interrater reliability among adolescents and young adults ( $\kappa=0.99$ ), test–retest reliability over 6 months ( $\kappa=0.70$ ), and strong agreement with other measures of SRTB (Nock et al. 2007). It is not possible to compute internal consistency statistics for the SITBI since the measure is not meant to sum items into a total score, but rather has some Likert and some dichotomous items in each module.

### *Modified Scale for Suicide Ideation*

The Modified Scale for Suicide Ideation (MSSI; Miller et al. 1986) is a semi-structured interview-based measure of suicide ideation composed of 18-items rated from 0 to 3 each, for a total score ranging from 0 to 54 with higher scores indicating greater suicide ideation. Its reliability and validity for use with adolescents has been supported in the past (Pettit et al. 2009) and internal consistency in the present sample was good with a Cronbach’s alpha of 0.92. In this study, the MSSI was used to establish the concurrent validity of the SITBI suicide ideation and suicide attempt modules. Specifically, the MSSI total score was used as a continuous measure of interviewer-rated suicide ideation and individual items were used as interviewer-ratings assessing the presence and intensity

of suicide ideation. For instance, the interviewer prompts used to rate the presence of suicide ideation include: “Do you want to die now?”, “Over the past year, have you thought about wanting to die?”, and “If yes, Over the past year, how often have you had the thought that you wanted to die? A little? Quite often? A lot? When you have wished for death, how strong had the desire been? Weak? Moderately strong? Very strong?” The interviewer used these prompts to determine whether the adolescent’s ideation fell into the *none*, *weak*, *moderate*, or *strong* category. In order to create a dichotomous variable for this item, any rating greater than *none* was considered the presence of ideation. Intensity of thoughts, which was used as a 4-point variable, was assessed using the following prompts: “Over the past year when you have thoughts about suicide, have they been intense (powerful)?” and “How intense have they been? Weak? Somewhat strong? Moderately strong? Very strong?” The interviewer then rated intensity on a 4-point scale ranging from *weak* to *very strong*.

### *Suicide Intent Scale*

The Suicide Intent Scale (SIS; Beck et al. 1974) is a semi-structured, interview-based measure of the intent to die associated with a suicide attempt. It consists of 15 items that the interviewer rates on a scale from 0 to 2 each for a total score between 0 and 30, with higher scores indicating greater suicide intent. In the present study, every previous suicide attempt described by the adolescent was assessed further with the SIS. As a result, if an adolescent had three previous suicide attempts, the interviewer would complete three SIS, one for each attempt. The total score from each attempt is then summed to give a continuous variable of suicide intent that takes into account both the number and seriousness of previous attempts. Traditionally, each SIS is used individually in order to determine the seriousness of attempts or to provide a count of the number of attempts for which an SIS was completed (which ignores the seriousness of each attempt). In this study, though, we wanted to use the SIS as a measure that collectively captured the number and seriousness of previous attempts, which is only accomplished by administering the SIS in reference to each attempt and then summing SIS scores from separate attempts to create a composite SIS score. For this reason, the number of SIS items administered differed according to the number of suicide attempts reported by each adolescent (e.g., an adolescent who reported one attempt answered 15 items whereas an adolescent who reported two attempts answered 15 items about each attempt, for a total of 30 items). A total score for the SIS was then computed by summing across all SIS items administered (e.g., sum of 15 items for an adolescent with one attempt, sum of 30 items for an adolescent with two attempts, sum of 45 items for an adolescent with three attempts, etc.). By creating a summed total in this way, the total SIS score used in this study

acknowledges both the frequency and seriousness of previous suicide attempts. Because the number of items administered varied in this way, an internal consistency estimate (known to be influenced by the number of items on a scale) was not computed. Previous research has confirmed the reliability and validity of this measure (Goldston 2000; Pettit et al. 2009). In the present study, the total suicide intent variable was used to evaluate the concurrent validity of the suicide gesture and suicide plan modules of the SITBI.

### *Beck Depression Inventory II*

One item (number 9) from the Beck Depression Inventory II (Beck et al. 1996) was used to assess the self-reported intensity of suicide ideation. The item, “Suicidal Thoughts or Wishes,” provides the following response options: 0 “I don’t have any thoughts of killing myself”, 1 “I have thoughts of killing myself, but I would not carry them out”, 2 “I would like to kill myself,” and 3 “I would kill myself if I had the chance.” Internal consistency for this measure was not computed since only one item was used.

### Data Analytic Strategy

*Preliminary Analyses* Skewness of SITBI items and prevalence of each SRTB was evaluated by computing the sample proportion endorsing each SRTB and the distribution of responses on the intensity of suicide ideation item. SRTB prevalence rates were compared to estimates from a community sample using independent samples *t*-tests between percentages.

*Concurrent Validity* First, kappa statistics were used to determine agreement between the SITBI and MSSSI’s dichotomous items regarding presence of suicide ideation. Adolescents who endorsed suicide ideation on the SITBI were compared with those who did not on total suicide ideation (MSSSI) using an independent samples *t*-test. Spearman rank correlations were computed to assess agreement among Likert ratings of the intensity of suicide ideation on the SITBI, BDI, and MSSSI. Next, adolescents who endorsed a suicide attempt on the SITBI were compared with those who did not on suicide ideation (MSSSI) using an independent samples *t*-test. Finally, adolescents who endorsed having made a suicide plan or gesture on the SITBI were compared to those who did not on overall intent to die (SIS) using independent samples *t*-tests.

## Results

### Preliminary Analyses

Following the strategy for psychometric evaluation presented by Clark and Watson (1995), each item of the SITBI used in

this study was first examined for high skewness and unbalance. For dichotomous outcomes, like those questions addressing the presence of each SRTB, Clark and Watson (1995) suggest eliminating items that 95 % of more of the sample either endorse or deny. In this sample, 82.1 % endorsed suicide ideation, 48.1 % suicide plan, 28.3 % suicide gesture, and 50.9 % suicide attempt. Therefore, no variables were deemed problematically unbalanced. Clark and Watson (1995) suggest that items rated on a Likert scale, like the rating for the intensity of suicide ideation, be questioned if “almost all” (p. 315) respondents answer the same way. In this sample, intensity was rated between 0 and 4 and the distribution of responses was as follows: 4.6 % = 0, 20.7 % = 1, 31.0 % = 2, 29.9 % = 3, 13.7 % = 4, suggesting that the item is adequately balanced.

Descriptive statistics for each SRTB are presented in Table 1. We compared the presence of each SRTB in the present sample (inpatient adolescents) with those reported by Nock et al. (2007; non-inpatient adolescents). Their sample

**Table 1** Descriptive statistics for the frequency of each SRTB

	<i>n</i>	Percentage
Lifetime frequency of suicide ideation		
0	19	17.9
1–10	40	37.7
11–100	30	28.3
101–500	17	16.0
Lifetime frequency of suicide plan <sup>a</sup>		
0	55	51.9
1–10	46	43.4
11–100	3	2.8
101–250	1	0.9
Lifetime frequency of suicide gesture		
0	76	71.7
1–10	27	25.5
11–20	3	2.8
Lifetime frequency of suicide attempt		
0	52	49.1
1–10	51	48.1
11–100	3	2.8

Data in this table is drawn from the Self-Injurious Thoughts and Behaviors Interview (see Measures). Specifically, adolescents were asked to provide estimates of how frequently *during their whole lives* they have engaged in each SRTB. For instance, with regard to Frequency of Suicide Ideation, adolescents were asked: “During how many separate times in your life have you had thoughts of killing yourself? (Please give your best estimate).” The frequency of each SRTB was capped at 500 to limit the effect of extreme outliers on data analyses. Suicide ideation *Min*=0, *Max*=500, *M*=76.65, and *SD*=154.52; suicide plan *Min*=0, *Max*=250, *M*=4.18, and *SD*=24.77; suicide gesture *Min*=0, *Max*=20, *M*=1.10, and *SD*=3.15; and suicide attempt *Min*=0, *Max*=100, *M*=2.06, and *SD*=9.89

<sup>a</sup> One adolescent was missing data on this module, therefore percentages are out of *N*=105

was recruited via announcements in outpatient psychiatric clinics, newspapers, community bulletin boards, and Internet message boards. These results are presented in Table 2. Rates of suicide ideation, plan, and gesture during the past year and past month were significantly higher in the present sample. Rates of suicide attempt (across all three time frames) were significantly higher in the present sample.

Concurrent Validity

Descriptive statistics for each concurrent validity measure are provided in Table 3. Correlations between continuous variables of the SITBI (i.e., frequency of each SRTB) and concurrent validity measures are presented in Table 4. In order to assess the concurrent validity of the SITBI, both interview-based and self-report measures of suicide ideation and suicide intent were used to avoid confounding validity with shared method variance, although it is important to note that all assessments were based upon self-reported information, with varying levels of clinical judgment. The suicide ideation module of the SITBI was assessed against another interview-based measure of suicide ideation, the MSSI (Miller et al. 1986) and a self-report item from the BDI-II probing for intensity of

**Table 2** Presence of SRTB in the current inpatient sample and Nock et al.’s (2007) mixed outpatient and community sample

	Community sample estimates (Nock et al. 2007)	Inpatient sample estimates (current study)	Comparison <i>z</i>
Suicide ideation			
Lifetime	70.2 %	82.1 %	-1.98
Past year	55.3 %	75.5 %	-3.01**
Past month	44.0 %	64.2 %	-2.86**
Suicide plan			
Lifetime	37.2 %	48.1 %	-1.55
Past year	24.5 %	41.5 %	-2.54*
Past month	12.8 %	31.1 %	-3.09**
Suicide gesture			
Lifetime	22.3 %	28.3 %	-0.97
Past year	12.8 %	25.5 %	-2.26*
Past month	2.1 %	14.2 %	-3.06**
Suicide attempt			
Lifetime	28.7 %	50.9 %	-3.19**
Past year	14.9 %	43.4 %	-4.39***
Past month	2.1 %	29.2 %	-5.15***

The present sample included 106 adolescent inpatients (*M<sub>age</sub>*=14.63, %Female=64.8). The non-inpatient sample data is taken from the initial SITBI study, conducted by another group—Nock et al.’s (2007) sample of 94 adolescents and young adults (*M<sub>age</sub>*=17.1, %Female=77.7). Comparisons were conducted using independent samples z-tests for proportions

\**p*<0.05, \*\**p*<0.01, \*\*\**p*<0.001

**Table 3** Descriptive statistics for concurrent validity measures

Measure	Mean	Standard deviation	Minimum	Maximum
MSSI total	18.1	13.4	0	49
SIS total	12.4	17.3	0	86
	% responded 0	% responded 1	% responded 2	% responded 3
BDI-II (Item 9)	39.4 %	34.6 %	18.3 %	7.7 %

*MSSI* Modified Scale for Suicide Ideation, *SIS* Suicide Intent Scale, *BDI-II* Beck Depression Inventory II Item 9, “Suicidal Thoughts or Wishes.” This item’s response options are: 0 “I don’t have any thoughts of killing myself”, 1 “I have thoughts of killing myself, but I would not carry them out”, 2 “I would like to kill myself,” and 3 “I would kill myself if I had the chance”

suicide ideation. The first question of the SITBI, “Have you ever had thoughts of killing yourself?” was used to create two groups based on the presence of suicide ideation. That variable demonstrated substantial agreement ( $\kappa=0.77, p<0.001$ ) with interviewer evaluation of suicide ideation on the first item of the MSSI, which probes for both desire to die at the present moment and desire to die over the last year (see item in *Measures*). Additionally, the two groups created by the SITBI suicide ideation variable differed significantly with regard to total suicide ideation on the MSSI ( $t=-7.45, p<0.001, d=2.33$ ). Those who endorsed suicide ideation on the SITBI had an average total score of 21.80 ( $SD=11.78$ ) on the MSSI, whereas those who did not endorse suicide ideation had an average total score of only 1.37 ( $SD=3.91$ ).

Furthermore, the intensity of suicide ideation, assessed in the SITBI using the question “On average, how intense were these thoughts?” and rated on a 5-point scale, was significantly correlated (using Spearman rank order correlation analyses due to highly skewed data) with the intensity of self-reported suicide ideation on the BDI-II (rated on a 4-point scale;  $r_s=0.38, p>0.001$ ), and the intensity of interviewer-rated suicide ideation on the MSSI (rated on a 4-point scale;  $r_s=0.59, p>0.001$ ).

**Table 4** Spearman correlations between continuous SITBI variables and concurrent validity measures

SITBI variable	MSSI total score	SIS total score	BDI-II item 9 (0, 1, 2, 3)
Lifetime frequency of suicide ideation	0.80***	0.54***	0.55***
Lifetime frequency of suicide plan	0.68***	0.58***	0.33**
Lifetime frequency of suicide gesture	-0.06	-0.03	0.02
Lifetime frequency of suicide attempt	0.65***	0.97***	0.40***

*SITBI* Self-Injurious Thoughts and Behaviors Interview, *MSSI* Modified Scale for Suicide Ideation, *SIS* Suicide Intent Scale

\*\* $p<0.01$ , \*\*\* $p<0.001$

Note that for these analyses, individuals who denied suicide ideation were given the lowest rating for suicide ideation intensity in order to avoid excluding them from analyses.

The concurrent validity of the suicide attempt module of the SITBI was assessed against an interviewer-rated measure of suicide ideation (MSSI). An independent samples *t*-test revealed that adolescents who reported ever having made a suicide attempt on the SITBI differed significantly from those who did not with regard to suicide ideation ( $t=-7.28, p<0.001, d=1.43$ ), with those who made an attempt endorsing much higher suicide ideation ( $M_{attempt}=25.59, SD_{attempt}=10.90, M_{noattempt}=9.96, SD_{noattempt}=10.98$ ).

The concurrent validity of the suicide plan and suicide gesture modules of the SITBI was assessed against an interviewer-rated measure of suicide intent, the SIS, since the behaviors theoretically lie at extreme ends of the suicide intent spectrum with those who make a suicide plan having high intent to die whereas those who make a suicide gesture having low (or absent) intent to die. As expected, those who reported having made a suicide plan on the SITBI scored significantly higher on the SIS than those who did not ( $t=-5.12, p<0.001, d=-1.01, M_{noplan}=4.78, SD_{noplan}=10.18, M_{plan}=20.57, SD_{plan}=19.70$ ) whereas there was no difference in suicide intent between those who did and did not report making a suicide gesture on the SITBI ( $t=-0.43, p=0.67, d=-0.09, M_{nogesture}=11.92, SD_{nogesture}=15.78, M_{gesture}=13.53, SD_{gesture}=21.07$ ).

## Discussion

The present study sought to examine the concurrent validity of the SITBI’s suicide ideation, gestures, plans, and attempt modules in a sample of inpatient adolescents. As the first study to extend previous validation efforts to an inpatient, adolescent sample, the present study demonstrated adequate agreement between these modules and other interview-based and self-report measures. Specifically, the concurrent validity of the SITBI was explored by assessing relations between the results of this structured interview with those of semi-structured interviews of suicide ideation (MSSI) and suicide intent (SIS) and self-reported intensity of suicide ideation (BDI-II item 9). Overall, data gathered from the SITBI demonstrated significant agreement with data gathered from other self-report and interviewer-rated sources. As expected, comparing the presence of suicide ideation, gestures, plans and attempts in the present sample of inpatients with those reported by Nock et al. (2007; in a sample of non-inpatient adolescents) revealed greater endorsement of SRTB over the last year and month in the inpatient sample—likely because SRTB is a common reason for inpatient admission. Notably, lifetime prevalence rates only differed with regard to suicide attempts. Since suicide attempts are the most severe SRTB assessed by

the SITBI, it is not surprising that rates among inpatients were not matched in Nock et al.'s (2007) mixed outpatient and community sample. While these comparisons suggest that the SITBI is able to detect SRTB across a range of prevalence and severity (from Nock et al. (2007) on one end to the inpatient sample explored here on the other), these analyses are limited because the present sample was younger and included a greater percentage of males than the sample used by Nock et al. (2007). Nonetheless, the noted differences in prevalence rates suggest that extending validity analyses to inpatients is warranted and that the original validation study should not necessarily be taken as evidence for the validity of the SITBI among inpatient samples.

It is important to note that validity analyses were not conducted for all SITBI modules in this study, for example the non-suicidal self-injury (NSSI) modules, and that therefore their validity cannot be assumed from this study's findings. Given the very high prevalence of NSSI among adolescents (DiClemente et al. 1991; Sim et al. 2009), this represents a limitation of the present study and evaluating these modules of the SITBI remains an important goal for future research that may benefit from employing established measures like the Deliberate Self-Harm Inventory (Gratz 2001). Moreover, the aim of the present study—to extend the concurrent validity of the SITBI suicide ideation, gestures, plans, and attempt modules—is limited to examining only concurrent validity. Indeed, assessing interrater reliability in this study was not possible given staffing limitations and hospital restrictions on recording interviews. Further, the acute nature of the unit and extremely brief stays of most adolescents prevented test–retest reliability from being assessed. These aspects of reliability should be examined in an inpatient sample, as was done in the initial validation study (Nock et al. 2007), in order to better understand the stability of SRTB in this group and be sure that the SITBI is not subject to undue influence from interviewer bias or other factors. Finally, the strategy of this study, comparing measurement of SRTB using the SITBI to several other previously established measures, is tempered by inconsistent timeframes across measures, a possible explanation for some inter-measure associations in the weak to moderate range. Indeed, inconsistency in timeframes points to a lack of viable concurrent validity measures currently in use in this field. Future research should therefore build upon the present study, by using other sources of concurrent information (like hospital admission records).

Despite the aforementioned limitations, these findings are strengthened by a number of factors. Specifically, the ethnic and racial diversity of the sample suggests that the SITBI is a valid interview for assessing inpatient adolescents from a variety of backgrounds. Furthermore, the diversity of the present sample improves upon the original validation of the SITBI (Nock et al. 2007), which used a predominantly European American sample. Another strength of this study is

a variety of methods of report including structured and semi-structured interview and self-report, which suggests that findings are not attributable solely to shared method variance. Still, it is important to note that all sources of report were based on the adolescent's report. For instance, even if an interviewer was using clinical judgment to determine whether an adolescent's experience was truly a suicide attempt, the adolescent was still the only source of information regarding that situation. Further research should use other sources of report, specifically parent and clinician report and objective sources of report like hospital records, to address this limitation.

Together, the results of this study have several clinical and theoretical implications. Clinically, our results underscore the importance of structured assessment of SRTB in adolescent inpatient settings, which are uniformly high. For instance, Esposito-Smythers et al. (2006) reported 68 % of inpatient adolescents had a previous suicide attempt and the “vast majority” endorsed suicide ideation. Wolff et al. (2013) reported 56 % of inpatient adolescents had a previous suicide attempt and Zaitsoff and Grilo (2010) reported 54 %. Clearly, structured assessment of SRTB and risk is of prime importance in these settings and should be incorporated into routine clinical care. Theoretically, our study emphasizes the importance of examining the psychometric properties of any assessment tool across samples drawn from different populations. Cronbach and Meehl (1955) were the first to advocate for a system of validity testing, which they termed the *nomological net*. This concept broadly suggests that validity testing must evaluate the performance of a given measure across multiple settings and situations in order to create a comprehensive network of knowledge regarding its accuracy to correctly classify individuals with and without a given problem. That the SITBI was found to demonstrate good psychometric properties in an inpatient adolescent setting speaks to its strength as a measure of SRTB regardless of setting.

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