Validity and Reliability of the Non-Suicidal Self-Injury Assessment Tool (NSSI-AT): Why Use the NSSI-AT?
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Background
Most studies of NSSI in community populations of youth and adults rely on one of two measures for which at least some psychometric data are available: the Deliberate Self-Harm Inventory (DSHI; Griffith, 2001) and the Functional Assessment of Self-Mutilation (FASM; Lloyd et al., 1997). Measures intended to assess NSSI as part of a continuum of self-injurious and suicidal behavior (SITB; Nock et al., 2007; SHBG; Gutierrez et al., 2001) are also used but contain a small number of items specific to NSSI. Both the DSHI and the FASM include measures intended to assess both NSSI characteristics (specific NSSI behaviors, frequency, and severity) with the FASM assessing additional characteristics, importantly including NSSI function. These surveys have been immensely useful in establishing the presence of NSSI and in documenting basic epidemiological characteristics such as form, frequency, and function, but they provide a limited picture of the phenomenology of NSSI.

The aim of the current study is to examine the validity and reliability of the Non-Suicidal Self-Injury Assessment Tool (NSSI-AT), a web-based measure of non-suicidal self-injury for use in general, community populations for research purposes. The NSSI-AT was developed to assess basic NSSI characteristics (such as form, frequency, and function) as well as secondary characteristics (including but not limited to motivations for initiating NSSI, addictive qualities of NSSI, the contexts in which it is practiced, NSSI severity, disclosure, and help-seeking). The NSSI-AT has been used in several large scale surveys (Cheng et al., 2010; Whitlock, Eckenrode, & Silverman, 2006; Whitlock et al., in press), including a longitudinal study collecting data over a three year period. An examination of content, construct, convergent, and discriminant validity, as well as test-retest reliability of the NSSI-AT, is presented here.

Tool Development
The NSSI-AT was developed using a thorough review of existing academic literature, exploratory interviews with 27 young adults with NSSI experience, and 9 interviews with mental health practitioners (e.g., a pediatrician, secondary school counselor, psychiatrist, psychologist) with extensive experience working with young people who self-injure. These interviews explored NSSI onset, triggers, function, related contextual factors, co-morbidity, therapeutic experiences, and cessation. Information gleaned from these interviews helped further refine the questions and response options which comprise the NSSI-AT. The tool was piloted in a 2 college study (Whitlock et al., 2006) and refined for use in an 8 college study (Whitlock et al., in press) and related longitudinal study.

NSSI-AT Modules

<table>
<thead>
<tr>
<th>Behavior based screening question</th>
<th>Dichotomous NSSI</th>
<th>NSSI lifetime frequency</th>
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<tbody>
<tr>
<td>Severity (frequency of uninterrupted severity, medical treatment for wounds, role of drugs &amp; alcohol)</td>
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<td>Function (social &amp; automatic response options)</td>
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<td>Contexts and practices (patterns in time, place, social involvement, etc.)</td>
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<td>Frequency and lethality (terminal)</td>
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<td>Incidence of future behaviors</td>
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<tr>
<th>Age of onset and cessation</th>
<th>Wound locations</th>
<th>Initial motivation (social, automatic, accidental response options)</th>
<th>Personal reflections and advice</th>
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</thead>
<tbody>
<tr>
<td>NSSI disclosure (who knows, suspects, has had conversation)</td>
<td>Formal treatment experience (efficacy)</td>
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<tr>
<th>FASM: Dichotomous measure of NSSI</th>
<th>DSHI (screening question)</th>
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<td>523***</td>
<td>848***</td>
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1The excludes three original FASM indicators (biting, picking at a second, and picking at skin) since these were not rated as common current means of NSSI or were overly broad.

Method
Data collection: The Survey of Student Wellbeing (SSWB) was administered to a randomly selected population from 8 universities in 2005-2007 as well as to a longitudinal sample of five of these schools from 2006-2009.

Test-retest data: A random sub-group of 300 individuals from the same universities was invited to participate in a follow-up administration of the SSWB (including the NSSI-AT) 4-6 weeks after the initial survey.

Measures comparison: Data comparing the NSSI-AT to basic screening items of other NSSI measures (the FASM and the DSHI) were collected from 300 individuals in the second wave of longitudinal data collection. Alternative NSSI measures were randomized in appearance before or after the NSSI-AT. Behavior-based response options in the NSSI-AT and the FASM were also randomized in hierarchy of appearance in the response option list.

Convergent & discriminant validity: In addition to the NSSI-AT, the SSWB includes measures such as suicide-related behavior (Furukawa, Kessler, & Andrews, 2003), disordered eating (Sile, Telch, & Rizvi, 2000), trauma history, sexual partner history, use of non-medical prescription drugs, and binge drinking.

Results
Content validity. Content validity refers to the systematic examination of the test content to determine whether it covers a representative sample of the behavior domain to be measured and is deemed to possess content validity through careful selection of which items to include (Anastasi & Urbina, 1997, p. 114). Several steps were taken to assure NSSI-AT content validity including tool construction grounded in thorough review of extant theory, existing measures, and in-depth interviews with individuals with varied backgrounds and experiences. The tool has been piloted with representatives of the target population willing to provide detailed feedback on content wording, representativeness, and ordering, and has found to describe NSSI experiences well.

Construct, convergent, and discriminant validity. Existing literature suggests that NSSI would be much more strongly correlated with mental health (MH) variables than with other risk taking behaviors. Tool validity was tested by assessing the strength of a dichotomously coded version of the NSSI screening variable with a) a set of MH variables with which we would expect NSSI to be highly correlated (suicide-related behavior, disordered eating, and number of lifetime traumas), b) a set of risk taking variables with which we would expect low or no significant correlation (non-medical prescription drug use, number of sexual partners in the last year, and binge drinking), and c) other measures of NSSI (the FASM and the DSHI). Results of these associations are shown below.

Discussion
The development of the NSSI-AT fills a void in the academic research regarding NSSI. First, NSSI and behaviors with a suicidal intent are clearly delimited with this assessment tool. The NSSI-AT is grounded on a definition of NSSI also accepted and promoted by the International Society for the Study of Self-Injury (2007), resolving much of the lack of clarity in definition that makes comparisons of findings from other tools, even regarding simple prevalence, challenging. The focus of the NSSI-AT on non-suicidal behaviors means this tool first and foremost assesses NSSI and not suicidality; the sophistication of this tool allows researchers to screen out false positives due to conflation with suicidality while still allowing researchers to explore the relationship between NSSI and suicide. Additionally, this tool not only has modules related to basic NSSI epidemiological information such as form, function, and frequency (which can be assessed with other NSSI measures) but is more nuanced. Thus, the NSSI-AT is able to assess NSSI characteristics lacking on other measures of NSSI, including motivations for initiating NSSI, the contexts within which NSSI is practiced, variation in NSSI severity, disclosure, and help-seeking. Finally, the breadth and depth of the NSSI-AT provide researchers with a unique opportunity to gather great detailed information (such as one might expect to obtain via a structured interview tool) from a large sample of individuals. This is because the web-based delivery of the NSSI-AT allows for some customization of questions and response options as a result of previous responses; display and skip logic embedded in the NSSI-AT mean detailed, nuanced questions are asked of those with pertinent experiences and are not seen by others.

Perhaps both a strength and a limitation of the NSSI-AT is its mode of delivery: this survey must be completed on-line. The skip patterns (which allow for detailed, nuanced questions and response options to be presented based on previous responses) embedded in this survey would make it cumbersome to complete in a paper-and-pencil format. However, on-line surveys represent an increasingly utilized mode of research data collection, one with which many people in particular may be comfortable sharing honest, personal information.

Due to the behavior-based items and the tool length, the NSSI-AT is not an ideal tool for use with younger populations (i.e., under high school age), nor has it been tested for use in clinical settings as a screening tool, though it may have use in this area.

References
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