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Characterizing Self-Injurious Cognitions: Development and Validation of the Suicide

Attempt Beliefs Scale (SABS) and the Nonsuicidal Self-Injury Beliefs Scale (NSIBS)

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Abstract

Self-injurious cognitions (SICs) are cognitions about deliberately injuring oneself (self-injurious behavior; SIB). Existing measures of the content of SICs provide varying coverage, highlighting a lack of consensus regarding which cognitions characterize SIB. Additionally, a central, unresolved conceptual and measurement issue concerns whether to conceptualise suicide attempts (SA) and nonsuicidal self-injury (NSSI), two forms of SIB, as separate constructs. We developed the Suicide Attempt Beliefs Scale (SABS) and the Nonsuicidal Self-Injury Beliefs Scale (NSIBS) to clarify which SICs characterize SA and NSSI and what factor structure best explains SA and NSSI cognitions. A series of factor analyses across six samples ($N = 3,313$) revealed that the SABS consists of seven correlated factors and the NSIBS consists of ten correlated factors. Both instruments contain factors that describe how SIB relates to oneself and others and demonstrate moderate to excellent test retest reliability over 2-4 weeks and strong internal consistency. 95% of the correlations between SABS and NSIBS subscales were $\leq r = .5$. Both instruments demonstrated small to moderate-sized correlations with a range of clinical variables, measures of well-being, and purportedly similar, existing SIB constructs. Various analyses indicate that SA and NSSI SICs are similar but distinct phenomena, supporting the use of separate terminology and definitions of SA and NSSI, and pointing to the importance of separating SA and NSSI in research and clinical practice. We hope that the development of the SABS and NSIBS may unify the field somewhat in its understanding and measurement of the basic constituent elements of SICs.

Public Significance Statement

This study involved developing two new self-report measures. One instrument measures the

beliefs that characterize suicide attempts (intentionally physically harming oneself to die).

One instrument measures the beliefs that characterize nonsuicidal self-injury (intentionally

physically harming oneself with no desire or intent to die).

Keywords

Self-injury; self-harm; suicide; assessment; therapy

Characterizing Self-Injurious Cognitions: Development and Validation of the

Suicide Attempt Beliefs Scale (SABS) and the Nonsuicidal Self-Injury Beliefs Scale

(NSIBS)

Self-injurious behavior (SIB) involves intentionally physically injuring oneself. Two forms of SIB can be distinguished depending on the presence of a reported or inferred intent to kill oneself (Silverman, 2016). A 'suicide attempt' (SA) is when someone intentionally physically injures themselves because they want and expect to kill themselves. 'Suicide' may or may not be a consequence of a SA (Brown et al., 2004). 'Nonsuicidal self-injury' (NSSI) is when someone intentionally physically injures themselves with no desire or intention of killing themselves or being dead. SA and NSSI often co-occur[1] (Klonsky, May & Glenn, 2013) and relate to one-another.

After over 50 years of research, one might assume that the conceptualization and measurement of the cognitions that characterize SIB – self-injurious cognitions (SICs) – would be clear and agreed. Unfortunately, however, this does not appear to be the case, as we outline below. This article describes the development of two multidimensional self-report measures of SA and NSSI-related beliefs, the Suicide Attempt Beliefs Scale (SABS) and the Nonsuicidal Self-Injury Beliefs Scale (NSIBS), which were designed to build upon existing measures. We developed these scales to characterize SICs in much greater detail than has been done before, and to directly test whether the same cognitions characterize SA and NSSI.

Limitations of Existing Measures

A large body of important research has attempted to understand the thinking involved in SIB, resulting in a range of instruments (for reviews, see Batterham et al., 2014; Kodaka et al., 2010). Broadly speaking, existing measures of the content of SICs tap either (1) perceptions that are thought to specifically underlie suicidal thoughts and/or SA, such as

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[1] Usually defined in the literature as occurring in the same person ever (lifetime) or in the past year.

hopelessness, defeat/entrapment, burdensomeness, unlovability, unbearability, unsolvability, thwarted belongingness, and acquired capability (e.g., Beck & Steer, 1993; Gilbert & Allan, 1998; Van Orden et al., 2012); and/or (2) the reasons, functions, and motivations for engaging in or refraining from SA and/or NSSI (e.g., Klonsky & Glenn, 2009; Linehan et al., 1983; Ma & Klonsky, 2013; Turner, Chapman & Gratz, 2014). As we outline next, existing measures are limited in several important ways, each of which points to the need to develop alternative scales.

Lack of Specificity. One major shortcoming with many cognitive constructs thought to underlie suicidal thoughts and/or SA, such as impulsivity, depression, hopelessness, and perceptions of defeat/entrapment, is that these constructs do not elucidate why people engage in a SA and/or NSSI *specifically*. In fact, accumulating evidence demonstrates that these constructs are relevant to many people and psychological problems (e.g., Anestis et al., 2014; Bostwick & Pankratz, 2000; Klonsky & May, 2014; Siddaway et al., 2015); most individuals reporting these perceptions do not attempt suicide, die by suicide, or engage in NSSI (Selby et al., 2014). In contrast, focussing on SICs – on precisely *what* an individual is thinking *about* SIB – may be particularly informative in clarifying why some people sometimes intentionally physically injure themselves, rather than choosing to use an alternative self-regulatory strategy (e.g., listen to music, go for a walk, problem-solve, ruminate, drink alcohol) in response to a particular internal or external trigger (e.g., emotional distress, social exclusion).

Poor Construct Validity. Measures of the reasons, functions, and motivations[2] for SAs and NSSI are presumably more specific to SIB, but are themselves subject to several limitations. Most importantly, there are fifteen or so of these measures and each scale provides different content coverage, highlighting a lack of consensus regarding exactly which

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[2] The literature uses these terms and concepts interchangeably. Sample items: 'When I self-harm, I am calming myself down' (Klonsky & Glenn, 2009); 'I attempted suicide because I wanted to get help from someone' (Ma & Klonsky, 2013).

cognitions characterize SIB. Furthermore, several of these scales contain multiple items that assess certain types of content but only single items that assess other content domains. This is a potential problem because meaningful content-based factors cannot be identified when only a single relevant marker is included in an item pool (Clark & Watson, 1995). Additionally, many existing measures of SICs were developed in the absence of an explicit theory; a practice that may have made it difficult for the literature to target novel variables or to explain relationships when they are observed.

Although existing measures of the reasons, functions, and motivations for SIB cover a range of content, none of these instruments were developed by including a broad range of SICs in the same item pool and conducted structural analyses to explore exactly which SICs best characterize SIB. Taken together, these issues mean that it is currently unclear which cognitions reliably characterize SIB and what factor structure best describes SICs. It is also unclear whether any between-study differences observed to date are due to substantive factors, or simply due to the use of different scales that provide varying and potentially incomplete content coverage.

Limited Explanatory Power. Asking about the reasons, functions, or motivations for SIB may have limited predictive ability because the same answers may be endorsed whether SIB occurred yesterday or 10 years ago, *even though an individual may no longer endorse a particular reason/function/motivation for SIB at all*. If this hypothesis is correct, these measures cannot be used to examine vulnerability to SIB, the transition from the first episode of SIB to repetition, or cognitive maintenance factors (e.g., differential endorsement of SICs in current versus recovered SIB groups or pre-post therapy groups).

Unresolved Conceptual Debate. A final, major concern with existing measures of SICs, is that they have not resolved the debate regarding whether it is possible or useful to conceptualize SA and NSSI as one construct or two separate constructs (see Muehlenkamp,

2014; Posner et al., 2014). Clarifying whether and how SICs differ across SA and NSSI has potentially fundamental implications for how we understand, describe, define, and individualise interventions for SA and NSSI.

The Current Research

The various issues discussed above suggest that existing scales may not comprehensively or reliably measure the cognitive content that characterizes SA and NSSI. Our goals in this article were to develop comprehensive, theory-driven, multidimensional measures of SICs, and to directly test whether the same set of items and/or factors characterize SA and NSSI. We highlight two particularly novel features of our approach.

First, the SABS and NSIBS were explicitly designed to measures beliefs about SA and NSSI (rather than thoughts, assumptions, reasons, expectations, or some other type or level of cognition; see Beck & Haigh, 2014). Beliefs are relatively enduring personal meanings or traits that confer vulnerability across situations, which can potentially fluctuate or change due to a range of factors, and which can be targeted and modified through psychological therapy (see Beck & Haigh, 2014). Beliefs about SIB potentially transcend individual differences in the phenomenology of SIB (e.g., people can have different automatic thoughts, mental images, or expectations regarding SIB during different episodes of SIB but the beliefs that underline SIB episodes are presumably relatively stable). In order to measure within- and between-person differences, the SABS and NSIBS ask how much the reader *currently* agrees with (believes) each SIC.

Second, candidate items were generated to operationalize the broad hypothesis that three domains of SICs characterize SA and NSSI. These were called *Positive SICs*, *Negative SICs*, and *Facilitating SICs*. *Positive SICs* are cognitions about perceived individual and interpersonal advantages of SA and NSSI (e.g., 'Attempting suicide changes the way that I am thinking' [individual]; 'NSSI helps me fit in with other people' [interpersonal]). The

presence and activation of these SICs is predicted to motivate people to want to engage in SA and NSSI. There are advantages and disadvantages to doing or not doing any behavior and SIB is no different. Thus, *Negative SICs* are cognitions about perceived individual and interpersonal disadvantages of SA and NSSI (e.g., 'NSSI makes my problems worse' [individual]; 'People think that my suicide attempt(s) are selfish' [interpersonal]). The presence and activation of these cognitions is predicted to motivate people to avoid SA and NSSI.

Positive and negative SICs may be simultaneously activated at times, which involves competing motivations to approach and avoid SIB (e.g., 'I want to cut myself but I know it's bad for me'). This cognitive dissonance is distressing (Harmon-Jones, Amodio & Harmon-Jones, 2009). A third domain of cognitions, *Facilitating SICs* (e.g., 'Just do it,' 'It's OK if I'm really upset'), are predicted to arise in response to sufficiently conflicting positive and negative SICs and are one potential mechanism that functions to resolve ambivalence about engaging in SIB. These cognitions enable people to proceed with a behavior that they want to enact and which they know to be unconstructive. Facilitating SICs are predicted to strengthen activation of positive SICs and/or inhibit activation of negative SICs by (i) justifying and giving permission to self-injure, (ii) relinquishing control and responsibility for SIB, (iii) de-prioritizing goals regarding alternative self-regulatory strategies, and (iv) allowing SIB to take place within certain conditions that aim to realise perceived advantages of SIB whilst minimising or avoiding perceived disadvantages. We predict that SA and NSSI are each characterized by the three domains of SICs; however, the exact content of SA and NSSI cognitions will potentially differ due to differences in the nature of these behaviours (e.g., frequency, lethality), their consequences, and how each is socially-constructed.

Examining the Psychometric Properties of the Two New Scales. We undertook a range of analyses to explicate the psychometric properties of the SABS and NSIBS. We

explore the test retest reliabilities of the SABS and NSIBS as strong temporal stability would corroborate our aim to develop instruments that measure beliefs (relatively enduring personal meanings for SA and NSSI; see Beck & Haigh, 2014). The SABS and NSIBS will be most clinically useful if they tap a broad range of content; examining the internal consistency of each instrument will therefore be instructive in clarifying whether the SABS and NSIBS each provide relatively narrow or broad content coverage.

It will also be informative to see how strongly the subscales of the SABS and NSIBS correlate within and between scales. These analyses will further clarify the range of content measured by the SABS and NSIBS and how closely related beliefs about SA are to beliefs about NSSI. As will be seen, these analyses are especially important given that five subscales (*Self-punishment, Escape, Dependence, Belonging, and Stigma*) convey such a similar theme in the SABS and NSIBS that they were assigned the same label.

Finally, it will be important to stringently test the need for the SABS and NSIBS given the presence of so many existing, similar measures of SICs and the debate regarding whether SA and NSSI should be considered one construct or two separate constructs. We therefore examine the convergent, discriminant, and incremental validity of the SABS and NSIBS against a broad range of: (1) Purportedly similar, existing constructs (reasons to live, current suicidal thinking, perceptions of unlovability, unbearability, burdensomeness, and thwarted belongingness); (2) theoretically related clinical constructs (symptoms of BPD, experiential avoidance, perceived stress, difficulties in regulating positive and negative emotions, emotional reactivity); and (3) measures of well-being (perceived social support, satisfaction with life, and subjective happiness and vitality).

We predicted 'moderate' to 'large' positive associations (Cohen, 1998) between the SABS and NSIBS and similar, existing measures; 'small' to 'moderate' positive associations (Cohen, 1998) with theoretically related clinical variables, including that the SABS would

tend to demonstrate stronger relationships with markers of suicidal thinking (e.g., current suicidal thinking, reasons to live, perceptions of unlovability and unbearability, burdensomeness, and thwarted belongingness that are thought to specifically underlie suicidal thoughts and/or SA) than the NSIBS; and 'small' to 'moderate' negative associations (Cohen, 1998) with measures of well-being. We further predicted that the SABS would continue to demonstrate statistically significant incremental predictive ability whilst controlling for the NSIBS and vice versa.

Scale Development

Participants and Recruitment

The SABS and the NSIBS were developed over six large, heterogeneous samples (N = 3,313) of people with lived experience of any type of SICs or SIB to ensure a wide range of responses were represented (sample descriptions are provided in the Supplementary material: Table S1). All studies received ethical approval. Samples were recruited online from a broad range of SIB and mental health forums, support websites, and mental health charities worldwide. We hoped that anonymous online recruitment from a broad range of sources would provide the best possible opportunity to obtain an accurate and representative understanding of the phenomenology of SICs because it is well-established that SIB is a highly stigmatized, often secretive behavior, and that the majority of SIB episodes (~70%) do not result in presentation to clinical services (e.g., Hawton et al., 2009). Indeed, some evidence has indicated that online recruitment increases SIB reporting by 2-3 times relative to non-anonymous techniques (e.g., Nock et al., 2008). Online participation also allowed us to randomise the ordering of our item pools, thereby eliminating an important potential source of error.

Item Generation and Refinement

A large and varied item pool was generated and refined through several steps. We aimed to generate an exhaustive list of distinct cognitions about SIB, and to incorporate the perspectives of clinicians, researchers, and individuals with lived experience of SIB. First, thirty-five people with lived experience of SIB completed a detailed 'thought capture' exercise in which they were asked to report any mental phenomena about SIB and its sequalae (thoughts, feelings, mental images, dreams, nightmares, memories, voices, sounds, smells, sensations, and tastes). Responses to the thought capture exercise were combined to create an item pool.

Next, the research team concurrently generated an item pool by drawing on a broad range of existing theory and knowledge, using the guiding framework of positive, negative, and facilitating SICs. The research team consisted of four academics, two of whom were clinician-researchers. One of the researcher team has been conducting research in the SIB field for 20+ years. Two of the team are practicing clinical psychologists who frequently work with individuals who are considering or engaging in SA and/or NSSI. Potential markers of the three domains of SICs were generated by drawing on all existing measures of SICs and SIB, indications regarding SICs in the SIB literature, clinical experience, online social support forums and testimonials, and theory, research, and measures from other literatures.

The two item pools were combined and then refined by 14 clinicians, 36 researchers (including clinician-academics), and 24 people with lived experience of SIB. In each stage of item pool development and refinement, any item that assessed distinct content was included. Whilst item generation was loosely organized in terms of positive, negative, and facilitating SICs, no constraints were placed on which items were to be included in the item pool; many items were therefore potentially consistent with all or parts of several different existing theoretical models. Which items to retain for the final scales was determined purely on empirical grounds, with no reference to our guiding theoretical framework. A more detailed

description of the item generation and refinement process is provided in the Supplementary

material.

Exploring How Best to Conceptualise Self-Injurious Behavior

Having generated a large and varied item pool, we began scale development by

conducting a large-scale, direct test of whether SA and NSSI cognitions differ. To achieve

this, items were initially phrased generically in relation to 'self-injurious behavior' ('SIB'),

with no reference to suicidal desire or intent (e.g., 'I would lose control without SIB').

Participants (Sample 1; $N = 698$) were asked to complete every item in the item pool twice:

Once in relation to SA and once in relation to NSSI. Different ratings of the same items for

the two behaviors would justify the development of separate scales; similar ratings would

justify the development of a single scale.

The terminology of 'SIB' was specifically selected in an attempt to minimize

ambiguity and misunderstanding. Several alternative terms such as 'self-harm' were

considered. However, these tend to carry specific connotations of SA or NSSI for members of

the public and may therefore have introduced error (e.g., in the UK, in our clinical

experience, many members of the public and clinicians use the terminology 'self-harm' to

refer to NSSI). To avoid confusion and in the interests of eliciting specific and nuanced SICs,

participants were provided with a definition of SIB[3] and a clarification of behaviours which

we do not consider to be SIB on every page of the survey (see Definitions of Key Constructs,

below). We did not see evidence or receive feedback that respondents misunderstood

terminology or definitions at any point in the scale development process.

Measure and Procedure

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[3] 'physically hurting or injuring yourself on purpose, whether you intend to kill yourself or not. (Also called suicide, self-injury, self-harm)'

The item pool consisted of 214 items, which were rated using a 7-point Likert scale ranging from *Strongly agree* to *Strongly disagree.* Items were presented in blocks of ~25 items per webpage and the ordering of blocks and items within blocks was randomized.

Results and Discussion

The intraclass correlation coefficient (ICC) examines how identical ratings are to each other by accounting for rank order (whether participants use the Likert scale in the same way) and absolute differences (mean levels). The average ICC across all 214 items = .61 (see Supplementary material: Table S3), which indicates 'moderate' agreement (Nunnally & Bernstein, 1994). This result provides direct evidence that participants perceive SA and NSSI as separate constructs, providing a rationale to construct separate scales for NSSI and SA.

<div align="center">

Preliminary Item Pool Analyses: Sample 1 ($N = 698$)

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Having established the need to construct separate scales to measure SA and NSSI beliefs, our focus shifted to evaluating the nature and quality of the items in our two initial item pools and identifying potentially important SICs that might be underrepresented.

Structural Analyses

The same approach to structural analyses was used in all samples (see Supplementary material). Exploratory factor analyses (EFA) was used to explore the factor structure of SA and NSSI beliefs until a clear and replicable factor structure emerged, at which time we shifted to confirmatory factor analysis (CFA) to directly test the generalizability of this factor structure, as per best practice for scale development. Parallel analysis (PA; Velicer, Eaton & Fava, 2000; Zwick & Velicer, 1986) was used to specify the number of factors that SPSS 21.0 (IBM Corp, 2012) extracted for each dataset using Maximum-likelihood (ML) EFA with promax rotation. Various sensitivity analyses were performed to check the robustness of the obtained factor solutions and these consistently yielded similar results, providing confidence

that a well-defined and reliable factor structure was located through PA and ML EFA with promax rotation in each sample (see Supplementary material).

In each EFA of an independent sample, the following criteria were adopted in order to extract the greatest number of factors that would be well defined and reasonably distinct from one-another. When two items correlated strongly ($\geq$ .75), the item with lowest item total correlation was considered to contain redundant information and was deleted (Clark & Watson, 1995). Items with loadings <.40 or which demonstrated reasonably strong loadings (>.3) on more than one factor were eliminated to maximise the measurement properties and discriminant validity of individual subscales (Clark & Watson, 1995).

Results

One item was removed that had inadvertently been included in the item pool twice. 12 strongly correlated items were deleted from the NSSI item pool and 3 from the SA item pool. PAs were then conducted and indicated 22 factors for NSSI and 18 factors for SA. At this stage, the 11 *Anti-suicide* items were analysed separately because, in contrast to the rest of the item pool, these items had referred to 'NSSI' rather than 'SIB.' A PA indicated 3 factors for these items. PAs of NSSI and SA items which included the *Anti-suicide* items produced very similar, although less interpretable, factor structures.

Cognitions about Attempting Suicide. An EFA suggested the existence of 11 potentially meaningful factors (see Supplementary material: Table S4). One factor, tentatively labelled *Self-punishment*, appeared to be underrepresented in our initial SA item pool. Five additional items were generated to explore whether doing so would allow a meaningful factor to emerge clearly in an independent sample.

Cognitions about Nonsuicidal Self-Injury. An EFA suggested the existence of 16 potentially meaningful factors (see Supplementary material: Table S5). Five factors appeared to be underrepresented in our initial NSSI item pool (tentatively labelled *Enjoyable*, *Anti-*

dissociation, *Escape*, *Backup plan*, and *Self-punishment*. Additional items were generated for each of these potential factors to explore whether doing so would allow corresponding, meaningful factors to emerge clearly in an independent sample.

Discussion

These results demonstrated that it is possible to identify specific, differentiable components of SICs. It is noteworthy that separate PAs and EFAs of the SA and NSSI items revealed different numbers of factors for SA and NSSI *for exactly the same items*. This result further supports the rationale for developing separate measures of SA and NSSI cognitions. However, these results were potentially limited by the possibility that the structural analyses may have been confounded by the design or by the administration of a large item pool. To address these potential concerns, we dropped the two-column methodology, rephrased items to refer to SA or NSSI specifically (rather than SIB), and administered fewer items to an independent sample.

<center>**Preliminary Item Pool Analyses: Sample 2 (*N* = 436)**</center>

This study aimed to explore the generalizability of the factor structure obtained using Sample 1 and to examine whether adding new items would encourage additional factors to emerge clearly. In total, 62 SA items and 118 NSSI items (including all the *Anti-Suicide* items) were administered.

Definitions of Key Constructs. SA and NSSI were defined on every page of the survey for this and subsequent samples. SA was defined as 'intentionally physically injuring yourself in order to kill yourself'. NSSI was defined as 'intentionally physically injuring yourself, but with no desire or intention of killing yourself or being dead.' Three behaviours which we do not consider to be SA or NSSI were also defined on every page of the survey in an attempt to minimize ambiguity and misunderstanding, as follows (1) 'Behaviours which unintentionally cause physical harm long-term (e.g. smoking, over-eating, binge drinking,

eating disorders, unprotected sex),' (2) 'Accidentally injuring yourself (e.g. accidentally touching something hot),' and (3) 'Behaviours which change your body for a cultural reason (e.g. body piercing, tattooing).'

Results

Cognitions about Attempting Suicide. A PA indicated eight SA factors. An EFA suggested the existence of 6 potentially meaningful factors (see Supplementary material: Table S7).

Cognitions about Nonsuicidal Self-Injury. A PA indicated 13 NSSI factors. An EFA suggested the existence of 12 potentially meaningful factors (see Supplementary material: Table S8).

Discussion

The factor structure for SA and NSSI observed in Sample 1 generally replicated in Sample 2, although fewer factors emerged and several of the factors were not particularly clearly defined (having no obvious single theme). This finding probably occurred because we were somewhat over-zealous in our efforts to reduce the item pool. Taken together, the structural results observed in Samples 1 and 2 did not provide a definitive indication of the factor structure of cognitions about SA or cognitions about NSSI. We therefore addressed this issue by administering most of the items that had been administered to Sample 1 as well as the new items that had been generated for Sample 2 to three additional samples, ensuring that multiple markers (at least 6 items) were included for all potential factors.

Development of the Final Scales: Samples 3 ($N = 484$), 4 ($N = 380$), and 5 ($N = 664$)

Three additional, independent samples were collected with two goals in mind: (1) To hone in on a clear factor structure for SA and NSSI beliefs, and (2) to locate strong and reliable markers for each identified factor. Once we had achieved these goals, we focused on developing scales that are reasonably short (and therefore relatively swiftly completed) yet

reliable measures of a wide range of content by retaining a subset of items from each factor.

We retained a minimum of three items per factor (Tabachnick & Fidell, 2007) and selected

items that tapped different facets of each SIC domain, ensuring that each subscale had at least

a good level of internal consistency ($\alpha \geq .8$; Clark & Watson, 1995). Rather than simply

retaining the highest loading items from each subscale (which would have improved

reliability but reduced validity), when subscales contained enough items to allow it, items

were progressively deleted from strongly correlated pairs of items (deleting the item with

lowest item total correlation) (Clark & Watson, 1995). A mean score was computed for each

subscale. Tables 1 and 2 present the final obtained factor structures of the SABS and NSIBS;

underlined items denote the items that we retained for the final scales and which are used in

the validation analyses. Further details, including descriptions of the themes conveyed by the

subscales of the SABS and NSIBS, are provided in the Supplementary material.

<center>INSERT TABLES 1 AND 2 ABOUT HERE</center>

Results

Cognitions about Attempting Suicide. Seven clearly interpretable and differentiated

factors characterized SA cognitions across Samples 3-5. These were labelled *Belonging*,

Stigma, *Self-punishment*, *Eliciting help*, *Escape*, *Dependence*, and *Revenge*.

Cognitions about Nonsuicidal Self-Injury. Ten clearly interpretable and

differentiated factors characterized SA cognitions across Samples 3-5. These were labelled

Escape, *Self-punishment*, *Anti-dissociation*, *Interpersonal influence*, *Stigma*, *Dependence,*

Problematic, *Anti-suicide*, *Enjoyable*, and *Belonging*.

Facilitating Cognitions. Items designed to measure facilitating SICs were

administered to Samples 1-3. However, a commensurate factor failed to emerge for either SA

or NSSI. The items designed to measure facilitating SICs loaded onto a variety of factors and

often cross-loaded. These items were therefore omitted from Samples 4 and 5 and do not feature in the final versions of the SABS or NSIBS.

Distress and Impaired Functioning Items. We also explored whether it would be informative to include items tapping how SA and NSSI impair functioning and cause clinically significant distress in Samples 2 and 3 because the diagnostic criteria for most psychiatric diagnoses includes the presence of functional impairment and/or clinically significant distress. However, these items performed poorly in our structural analyses and were therefore omitted from the final scales (see Supplementary material: Tables S7-S10).

Discussion

The same factor structure emerged across Samples 3, 4, and 5, indicating that robust and replicable factor structures characterize SA and NSSI cognitions.

Confirmatory Factor Analysis: Sample 6 ($N = 650$)

Having located what appeared to be well-defined and replicable factor structures for the SABS and NSIBS, we collected an additional sample to further test the generalizability of the EFA results using CFA. We also then conducted exploratory structural equation modeling (ESEM), which is argued to combine the advantages of EFA and CFA (Marsh, Morin, Parker, & Kaur, 2014). CFA was conducted using the R lavaan package, version 0.5-23.1097 (Rosseel, 2012) and ESEM was conducted using MPlus, version 7.4 (Muthén & Muthén, 2013).

Method

Model Fit Statistics. Acceptable fit was operationalized as Comparative Fit Index (CFI) $\geq$ .90, Tucker Lewis Index (TLI) $\geq$ .90, and Root Mean Squared Error of Approximation (RMSEA) $\leq$ .08. Good fit was operationalized as CFI $\geq$ .95, TLI $\geq$ .95, Standardized Root Mean Square Residual (SRMR) $\geq$ .08, and RMSEA $\leq$ .06 (Hu & Bentler, 1999). Our data were somewhat non-normal so we computed 'robust' ML versions of the fit

statistics. When standard fit statistics were examined, fit results were similar and conclusions were identical.

Competing CFA and ESEM models were compared using (i) Bayesian Information Criterion (BIC), where lower BIC statistics suggest better fit whilst adjusting for parsimony, and (ii) CFI, using a .002 cutoff (Meade, Johnson & Braddy, 2008). BIC and CFI are advocated over the chi-squared and chi-squared difference statistics for judging model fit and comparing competing models because these statistics are less compromised by large sample sizes and are more sensitive to detect differences (Cheung & Rensvold, 2002; Meade et al., 2008).

Testing Alternative Measurement Models for the SABS and NSIBS. A range of potential CFA models were examined. We first tested the EFA results from Samples 3-5. A 9-factor model for the NSIBS was examined because the *Interpersonal influence* and *Belonging* factors merged in Sample 4 (see Supplementary material: Table S12). Five other potential measurement models were also examined for each instrument, including (i) a bifactor model in which all items load on a single general factor and, separately, the items that make up each subscale load on corresponding specific factors (general and specific factors are uncorrelated and specific factors are uncorrelated); (ii) a second-order model in which specific factors load on to a single second-order factor representing beliefs about SA or NSSI; (iii) an alternative second-order model, which specified two second-order factors representing self versus others; (iv) a first-order model in which all items load on a single factor representing beliefs about SA or NSSI; and (v) an alternative first-order model, which specified two first-order factors representing self versus others.

A series of CFAs were also conducted to test whether the SABS and NSIBS are best understood as separate scales/constructs. We first tested whether the identically labelled SABS and NSIBS subscales are best understood as separate scales/constructs. We then tested

the potential separateness of the SABS and NSIBS by specifying a 17 correlated factors

model and then a bifactor model that contained all 17 factors from both instruments.

CFA is subject to some important limitations (see Marsh et al., 2014) that could

potentially limit the robustness and generalizability of our results. We conducted ESEM to

address this potential concern (Marsh et al., 2014). ESEM using goemin rotation was

conducted to test the replicability of the EFA results obtained in Samples 3-5, as well as

adjoining models. We thus specified a 6, 7, and 8 factor structure for the SABS and a 9, 10,

and 11 factor structure for the NSIBS. We also replicated the analyses testing the potential

separateness of the SABS and NSIBS.

INSERT TABLE 3 ABOUT HERE

Results and Discussion

The CFAs clearly indicate that the SABS and NSIBS are best understood as separate

instruments that each consist of separate correlated subscales. A 7-factor CFA model fit the

SABS well and a 10-factor CFA model fit the NSIBS well. For both scales, the CFI and TLI

statistics demonstrated a fit that was between 'acceptable' and 'good' and the SRMR and

RMSEA evidenced a 'good' fit. These fit statistics are impressive, given the complexity of these

CFA models. All alternative CFA models fit the data less well and most alternative models

provided a very poor fit.

The CFA results were replicated using ESEM. The BIC and CFI statistics favour different

factor solutions. The 7-factor model for the SABS and 10-factor model for the NSIBS are the

preferred measurement models for two reasons. First, there is a substantial literature

demonstrating that BIC is to be favoured over other fit indices in its ability to select the correct

number of factors to retain in EFA and SEM, especially when there are a large number of

parameters (e.g., Bollen et al., 2014; Song & Belin, 2008). Second, inspection of the factor

loadings for competing models revealed that the 8-factor SABS model and 11-factor NSIBS

model contained factors that were not clearly defined (having no obvious single theme). The 8-

factor SABS model contained two spurious factors that were made up of items from factors that

had been separate in our EFAs and CFAs, and each of these factors contained only two items that

loaded above .4. The 11-factor NSIBS model contained one spurious factor that was made up of

items from factors that had been separate in our EFAs and CFAs and no items loaded above .4 on

this factor. In contrast, all items loaded on all factors as expected in the 7-factor SABS model and

10-factor NSIBS model, closely replicating our EFA and CFA results. These measurement

models demonstrated a fit that was 'good' across all fit indices. In summary, across CFA and

ESEM, a 7-factor model fits the SABS well and a 10-factor model fits the NSIBS well and the

SABS and NSIBS are best understood as separate instruments.

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Scale Validation

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A range of measures were completed by Samples 5 and 6 for validation purposes. The

SABS and NSIBS were completed a second time after 2-4 weeks to compute test retest

reliabilities. This time-period was selected to explore our aim to measure beliefs (relatively

enduring personal meanings for SA and NSSI). It is a time-period that balances the

downsides of a short versus a long time interval between test administrations (short intervals

can be subject to carry-over or recall effects; long intervals increase the likelihood that a

significant life event or other change will occur; Allen & Yen, 1979). We report McDonald's

coefficient omega because cronbach's alpha is argued to be subject to several limitations

(Sijtsma, 2009; Zinbarg et al., 2005). Omega was computed using the R psych package,

version 0.5-23.1097 (Rosseel, 2012).

Measures

Self-Injurious Thoughts and Behavior. All participants were asked questions about

the lifetime presence, frequency, and recency of NSSI thoughts and behavior, suicidal

thoughts and behavior, and whether they had experienced thoughts about SA and NSSI at the

same time or in relation to one-another (see Supplementary material: Table S1). Presence of

lifetime suicidal thoughts was assessed by the question 'Have you ever thought about killing

yourself (attempting suicide)?' Presence of lifetime suicide attempts was assessed by the

question 'Have you ever attempted to kill yourself with at least some intention of dying?

(Suicide attempt).' Presence of lifetime NSSI thoughts was assessed by the question 'Have

you ever thought about physically injuring yourself on purpose, but with no desire or

intention of dying (Nonsuicidal self-injury)?' Presence of lifetime NSSI was assessed by the

question 'Have you ever physically injured yourself on purpose, but with no desire or

intention of dying (Nonsuicidal self-injury)?'

Measures Completed by Sample 5

      Beck Scale for Suicide Ideation (BSS; Beck & Steer, 1991). The BSS is a 21-item

measure of suicide desire, perceived capability to make a SA, and SA plans and preparations.

The two optional items (20 and 21) were not administered. The BSS has strong psychometric

properties (Beck & Steer, 1991). Factor analytic results generally support a two factor

solution. *Suicidal Desire and Ideation* measures a desire for death, frequency of suicidal

ideation, and lacking deterrents for suicide; *Resolved Plans and Preparations* measures

specific plans and suicidal intent. As there is no consensus on the exact composition of the

two factors, we determined the best fitting measurement model using EFA (see

Supplementary material). The *Suicidal Desire and Ideation* factor had an ω of .92 and the

Resolved Plans and Preparations factor had an ω of .77. Items 10, 11, 15, and 19 performed

poorly and were omitted.

      Suicide Cognitions Scale (SCS; Rudd et al., in preparation). The SCS is an 18

item measure of suicidal beliefs. Items are rated on a 5-point Likert scale ranging from

Strongly disagree to *Strongly agree*. Although the scale is unpublished, two studies have

demonstrated good psychometric properties. As there has been debate regarding whether a

two- or three-factor structure is optimal, we determined the best fitting measurement model

using EFA (see Supplementary material). A two-factor solution fit our data best. The

Unlovability factor had an ω of .92 and the *Unbearability* factor had an ω of .93. Items 10 and 17 were not analyzed because they cross-loaded.

Interpersonal Needs Questionnaire (INQ; Van Orden et al., 2012). The INQ is a 15-item measure of the belief that other people would be better off without the respondent (*Perceived burdensomeness*) and a perception of a lack of interpersonal connections (*Thwarted belongingness*). Items are rated on a 7-point Likert scale ranging from *Not at all true for me* to *Very true for me*. The INQ has good psychometric properties (Hill et al., 2015; Van Orden et al., 2012). The *Perceived burdensomeness* factor had an ω of .93 and the *Thwarted belongingness* factor had an ω of .89.

Mclean Screening Instrument for Borderline Personality Disorder (MSI-BPD; Zanarini et al., 2003). The MSI-BPD is a 10-item self-report measure that identifies individuals who are likely to meet DSM-IV diagnostic criteria for BPD. Each item is rated on a *Yes/No* basis and a total score is computed. The scale has some demonstrated psychometric properties and a cutoff of 7 or more yielded good sensitivity (.81) and specificity (.85) for the diagnosis of DSM-IV BPD (Zanarini et al., 2003). Item 2, which assesses intentional physical injury, was omitted to avoid confounding results. The MSI-BPD had an ω of .73.

Brief Experiential Avoidance Questionnaire (BEAQ; Gamez et al., 2014). The BEAQ is a 15-item measure of experiential avoidance. Items are rated on a 6-point Likert scale ranging from *Strongly disagree* to *Strongly agree*. The scale has reasonable psychometric properties (Gamez et al., 2014). The BEAQ had an ω of .86.

Short Form Perceived Stress Scale (PSS-4; Cohen et al., 1983). The PSS-4 is a 4-item self-report measure of the subjective experience of stress, rated for the past month. Respondents use a 5-point Likert scale ranging from *Never* to *Very often*. The scale has good psychometric properties (Warttig et al, 2013). The PSS-4 had an ω of .80.

Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988).

The MSPSS is a 12-item self-report instrument designed to assess perceived social support

from family, friends, and significant others. Items are rated on a 7-point Likert scale ranging

from *Very strongly disagree* to *Very strongly agree* and a total score is computed. The scale

has good psychometric properties (Osman et al., 2014). The MSPSS had an ω of .90.

Measures Completed by Sample 6

Depressive Symptom Inventory-Suicidality Subscale (DSI-SS; Metalsky &

Joiner, 1997). The DSI-SS is a 4-item self-report questionnaire designed to identify the

frequency and intensity of suicidal ideation and impulses in the past two weeks, rated on a 4-

point scale. The scale has been shown to have reasonable psychometric properties (Joiner,

Pfaff & Acres, 2002). The DSI-SS had an ω of .89.

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The

DERS is a 36-item measure of difficulties regulating various dimensions of negative emotion.

Items are rated on a 5-point Likert scale ranging from *Almost never* to *Almost always*. Factor

analytic studies to date have produced somewhat mixed results, although most studies

support a six factor model (Fowler et al., 2014). The DERS' subscales demonstrated the

following alpha coefficients: *Nonacceptance of emotional responses* (ω = .90), *Difficulty*

engaging in goal-directed behavior when experiencing negative emotions (ω = .87), *Impulse*

control difficulties when experiencing negative emotions (ω = .90), *Lack of emotional*

awareness (ω = .84), *Limited access to emotion regulation strategies* (ω = .87), and *Lack of*

emotional clarity (ω = .87).

Difficulties in Emotion Regulation Scale-Positive (DERS-Positive; Weiss, Gratz

& Lavender, 2015). The DERS-Positive is a 13-item measure of difficulties regulating

various dimensions of positive emotion. Items are rated on a 5-point Likert scale ranging

from *Almost never* to *Almost always*. The DERS-Positive's subscales demonstrated the

following alpha coefficients: *Nonacceptance of Positive Emotions* (ω = .88), *Difficulties engaging in goal-directed behavior when experiencing positive emotions* (ω = .93), and *Difficulties controlling behaviors when experiencing positive emotions* (ω = .93).

      Emotion Reactivity Scale (ERS; Nock et al., 2008). The ERS is a 21-item measure of the sensitivity, intensity, and duration of emotions, rated on a 5-point Likert scale ranging from *Not at all like me* to *Completely like me*. The scale has some demonstrated psychometric properties that were based on a single, small sample (Nock et al., 2008). The ERS had an ω of .94.

      Brief Reasons for Living Scale (BRFLS; Ivanoff et al., 1994). The BRFLS is a short measure of reasons for living. There are six subscales and items are rated on a 6-point Likert scale ranging from *Not at all important* to *Extremely important*. The scale has good psychometric properties and is widely used (Ivanoff et al., 1994). The RFL's subscales demonstrated the following alpha coefficients: *Survival and coping beliefs* (ω = .49), *Responsibility to family* (ω = .79), *Child-related concerns* (ω = .95), *Fear of suicide* (ω = .70), *Fear of social disapproval* (ω = .81), and *Moral objections* (ω = .75).

      Current mood. Participants were asked to select which of eight moods (energetic/alert, enthusiastic/euphoric, peaceful/serene, relaxed/calm, tired/sluggish, sad/down, tense/upset, anxious/jittery) best described how they 'currently feel, right now.' The eight affective states used were adapted from the 12-Point Affect Circumplex Scales (Yik, Russell & Steiger., 2011) and were used to compute four mutually exclusive combinations of valence (positive/negative) and arousal (activated/deactivated).

      Satisfaction with Life Scale (SWLS; Diener et al., 1985). The SWLS is a 5-item measure of participants' global assessments of how satisfied they are with their lives. Items are rated on a 7-point Likert scale ranging from *Strongly disagree* to *Strongly agree*. The SWLS had an ω of .86.

Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999). The SHS is a 4

item measure of perceived happiness, rated on a 7-point Likert scale. A total score is

computed. The SHS has reasonably good published psychometric properties (Lyubomirsky &

Lepper, 1999). However, Item 4, which is reverse-scored, performed quite oddly and was

therefore omitted (see Supplementary material). Items 1-3 demonstrated an ω of .90.

Subjective Vitality Scale (SVS; Ryan & Frederick, 1997). The SVS consists of 6

items and taps perceptions of being full of energy and alive rated on a 1 (*Not at all true*) to 7

(*Very true*) scale. The SVS has good psychometric properties (Ryan & Frederick, 1997). The

SVS had an ω of .89.

Missing Data

There were relatively small amounts of missing data on some variables in several

samples, which was not missing completely at random (MCAR; see Supplementary material).

We multiply imputed missing data on all variables at the item level (Gottschall, West &

Enders, 2012) using SPSS version 21.0 (IBM Corp, 2012). Predictive mean matching

imputation was used because the data were somewhat skewed. The number of imputations

was matched to the percentage of missing information in each sample (White, Royston &

Wood, 2011). We entered all available variables (including demographic information) into

each model to generate plausible values for missing data.

<div align="center">

Results

</div>

Internal Consistency and Test-Retest Reliability

Table 4 presents internal consistency reliabilities and average interitem correlations

(AICs) for the subscales of the SABS and NSIBS across four samples. Omega reliabilities are

consistently strong for each subscale, ranging from .76 to .95. Just four of the 76 coefficients

fall below ω = .80, and every subscale reaches or exceeds ω = .80 in at least two samples. We

also computed AICs because of the limitations of cronbach's alpha (Sijtsma, 2009; Clark &

Watson, 1995). AICs of around .15 measure relatively broad constructs and AICs of around

.50 measure relatively narrow constructs (Clark & Watson, 1995). The subscales of the SABS

and NSIBS demonstrate high AICs, indicating that each subscale measures a relatively

narrow and specific dimension of SICs. The AICs for the total score for each scale indicates

that the SABS and the NSIBS tap a range of moderately related content.

Table 4 also presents the test retest reliabilities for the subscales of the SABS and

NSIBS over 2-4 weeks (M = 18 days, Median = 17 days). The ICC statistics indicate

'moderate' to 'excellent' agreement over time (Nunnally & Bernstein, 1994).

INSERT TABLE 4 ABOUT HERE

SABS and NSIBS Subscale Means and Standard Deviations.

Means and standard deviations for the subscales of the SABS and NSIBS across four

samples are presented in the Supplementary material (a mean score was computed for each

subscale). Our samples endorsed the SABS Stigma, Self-*punishment*, and *Escape* subscales

most strongly and the *Belonging* and *Revenge* subscales the least. They endorsed the NSIBS

Self-punishment, *Escape*, and *Stigma* subscales most strongly and the *Belonging* and

Interpersonal influence subscales the least. The NSIBS tended to be endorsed more strongly

than the SABS.

Internal Structure of the SABS and NSIBS

Correlations among the subscales of the SABS, among the subscales of the NSIBS,

and between the subscales of the SABS and NSIBS, are presented in the Supplementary

material (Tables S16-S18). These correlations were generally in the moderate range,

indicating that specific facets of SICs can be clearly distinguished. 95% of the correlations

between SABS and NSIBS subscales were 'small' to 'medium' in size (rs ≤ .50; (Cohen,

1998). Subscales with identical labels exhibited 'moderate' to 'large' (Cohen, 1998) positive

correlations (rs range from .22 to .61).

Convergent and Discriminant Validity

Correlations between the subscales of the SABS and NSIBS and a range of clinical and well-being measures are presented in the Supplementary material (Table S19). Steiger's (1980) modification of the Hotelling test for two correlations involving a common variable was used to test whether identically labelled SABS and NSIBS subscales had statistically significantly different correlations with other variables.

As predicted, the subscales of the SABS and NSIBS evidenced 'small' to 'moderate' positive correlations (Cohen, 1998) with two measures of current suicidal thinking; 'moderate' positive correlations (Cohen, 1998) with perceptions of unlovability and unbearability, burdensomeness, and thwarted belongingness; 'small' negative correlations (Cohen, 1998) with reasons to live; 'small' to 'moderate' positive correlations (Cohen, 1998) with symptoms of BPD, experiential avoidance, difficulties in regulation positive and negative emotions, and emotional reactivity; were almost uncorrelated with perceived stress; and 'small' to 'moderate' negative correlations (Cohen, 1998) with perceived social support, satisfaction with life, subjective happiness, and subjective vitality.

The subscales of the SABS and NSIBS, including the identically-labelled subscales, tended to demonstrate different sized relationships with other variables. The SABS tended to demonstrate stronger relationships with current suicidal thinking, reasons to live, and perceptions that are thought to specifically underlie suicidal thoughts and/or SA (perceptions of unlovability and unbearability, burdensomeness, and thwarted belongingness) than the NSIBS, pointing to the discriminant validity of this scale.

Incremental Validity

The incremental validity of the SABS and NSIBS was explored in a series of multivariate hierarchical regressions (Supplementary material: Tables S20-S23). We explored whether SABS subscales predicted current suicidal thinking and lifetime suicide attempts,

and replicated these analyses in samples 5 and 6, and whilst controlling for the NSIBS. We also explored whether the SABS subscales predicted lifetime NSSI thoughts and lifetime NSSI behaviour, and replicated these analyses in samples 5 and 6, and whilst controlling for the NSIBS.

In sample 5, the multivariate hierarchical regressions controlled for demographic variables, perceptions of unlovability, unbearability, burdensomeness, thwarted belongingness, symptoms of BPD, experiential avoidance, perceived stress, and social support. In sample 6, the multivariate hierarchical regressions controlled for demographic variables, difficulties in regulating negative and positive emotions, reasons for living, emotional reactivity, current mood, and satisfaction with life, subjective happiness, and subjective vitality.

For the linear regressions, demographic variables were included at Step 1, clinical and well-being variables at Step 2, and the subscales of the SABS or NSIBS at Step 3. For the logistic regressions, demographic, clinical, and well-being variables were included at Step 1, and the subscales of the SABS or NSIBS were included at Step 2. Statistically significant univariate predictors were included in our multivariate models.[4] Standardized coefficients are reported for logistic models (β_{stdXY}) to enable the relative magnitude of effects to be examined (Menard, 2011).

Current Suicidal Thoughts. The SABS demonstrated a statistically significant ΔR^2 of .04 in predicting current suicidal thinking as measured by the BSS total score when controlling for a broad range of variables. The *Belonging* ($\beta = -.61$, $p < .05$), *Self-punishment* ($\beta = .42$, $p < .05$), and *Dependence* ($\beta = .97$, $p < .001$) subscales were statistically significant predictors. When controlling for the NSIBS in this analysis, the predictive ability of the

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[4] Because there is some debate as to whether it is useful to exclude nonsignificant univariate predictors from multivariate models, the multivariate regressions were rerun using the excluded variables. The nonsignificant predictors did not demonstrate statistically significant unique associations, change the significance of variables already in the model, or meaningfully increase R^2.

SABS was only minimally affected: ΔR^2 was reduced by .01 and the statistical significance of relationships was unchanged (β values tended to change somewhat).

The SABS demonstrated a statistically significant ΔR^2 of .07 in predicting current suicidal thinking as measured by the DSI-SS when controlling for a broad range of variables. The *Stigma* ($\beta = .21$, $p < .05$), *Escape* ($\beta = -.20$, $p < .05$), and *Dependence* ($\beta = .63$, $p < .001$) subscales were statistically significant predictors. When controlling for the NSIBS, the predictive ability of the SABS was only minimally affected: ΔR^2 was reduced by .02 and the statistical significance of relationships was unchanged (β values tended to change somewhat).

Across these regressions, the *Belonging, Eliciting help*, and *Revenge* SABS subscales demonstrated negative relationships with the BSS, and the *Belonging, Self-punishment, Escape*, and *Revenge* subscales demonstrated negative relationships with the DSI-SS.

Lifetime Suicide Attempts. In sample 5, the SABS *Belonging* ($\beta = -.34$, $p < .01$, OR = .71), *Stigma* ($\beta = .44$, $p < .001$, OR = 1.55), *Self-punishment* ($\beta = .56$, $p < .001$, OR = 1.75), and *Escape* ($\beta = .40$, $p < .01$, OR = 1.50) subscales statistically significantly predicted lifetime suicidal behavior when controlling for a broad range of variables. When controlling for the NSIBS in this analysis, the predictive ability of the SABS was slightly changed: Cox & Snell R^2 increased by .02 and the statistical significance of relationships was unchanged (β values tended to change somewhat).

In sample 6, the SABS *Belonging* ($\beta = -.33$, $p < .01$, OR = .72), *Stigma* ($\beta = .39$, $p < .01$, OR = 1.48), *Self-punishment* ($\beta = .85$, $p < .001$, OR = 2.34), and *Escape* ($\beta = .37$, $p < .01$, OR = 1.45) subscales statistically significantly predicted lifetime suicidal behaviour when controlling for a broad range of variables. When controlling for the NSIBS, the predictive ability of the SABS was slightly changed: Cox & Snell R^2 increased by .03 and the SABS *Revenge* subscale ($\beta = -.47$, $p < .001$, OR = .62) now demonstrated a statistically significant relationship.

Across these regressions, the *Belonging, Eliciting help*, and *Revenge* SABS subscales demonstrated negative relationships with lifetime suicidal behaviour in sample 5, and the *Revenge* subscale demonstrated negative relationships with lifetime suicidal behaviour in sample 6.

Lifetime Nonsuicidal Self-Injury Thoughts. In sample 5, the NSIBS *Anti-suicide* (β = .61, $p < .05$, OR = 1.84) and *Belonging* (β = -.81, $p < .01$, OR = .45) subscales statistically significantly predicted lifetime NSSI thoughts when controlling for a broad range of variables. When controlling for the SABS in this analysis, the predictive ability of the NSIBS was slightly changed: Cox & Snell R^2 increased by .03 and the statistical significance of relationships was unchanged (β values tended to change somewhat).

In sample 6, the NSIBS *Escape* (β = 1.15, $p < .001$, OR = 3.15) and *Belonging* (β = -.67, $p < .05$, OR = .51) subscales statistically significantly predicted lifetime NSSI thoughts when controlling for a broad range of variables. The predictive ability of the NSIBS was unchanged when controlling for the SABS. The statistical significance of relationships was unchanged and β values tended to change somewhat.

Across these regressions, the *Interpersonal influence* and *Belonging* NSIBS subscales demonstrated negative relationships with lifetime NSSI thoughts in sample 5, and the *Interpersonal influence, Dependence,* and *Belonging* NSIBS subscales demonstrated negative relationships with lifetime NSSI thoughts in sample 6.

Lifetime Nonsuicidal Self-Injury. In sample 5, the NSIBS *Escape* (β = .94, $p < .01$, OR = 2.56), *Interpersonal influence* (β = -.59, $p < .05$, OR = .56), and *Belonging* (β = -.68, $p < .05$, OR = .50) subscales statistically significantly predicted lifetime NSSI when controlling for a broad range of variables. When controlling for the SABS in this analysis, the predictive ability of the NSIBS was somewhat changed: Cox & Snell R^2 increased by .04 and the *Escape* and *Interpersonal influence* subscales became statistically non-significant predictors.

In sample 6, the NSIBS *Escape* (β = .90, p < .01, OR = 2.47), *Interpersonal influence* (β = -.61, p < .01, OR = .55), *Stigma* (β = .51, p < .05, OR = 1.67), and *Belonging* (β = -.80, p < .01, OR = .45) subscales statistically significantly predicted lifetime NSSI when controlling for a broad range of variables. When controlling for the SABS in this analysis, the predictive ability of the NSIBS was slightly changed: Cox & Snell R^2 increased by .01 and the statistical significance of relationships was unchanged (β values tended to change somewhat).

Across these regressions, the *Interpersonal influence*, *Dependence*, and *Belonging* NSIBS subscales demonstrated negative relationships with lifetime NSSI in sample 5, and the *Anti-dissociation*, *Interpersonal influence,* and *Belonging* NSIBS subscales demonstrated negative relationships with lifetime NSSI thoughts in sample 6.

General Discussion

We developed the SABS and the NSIBS across six large, independent samples of people with lived experience of SIB (total N = 3,313). Our factor analyses revealed clearly interpretable and differentiated factors that replicated well, pointing to the robustness and generalizability of our findings and the separateness of the two instruments. The SABS consists of seven separate correlated factors and the NSIBS consists of ten separate correlated factors. Both scales (i) contain items that measure perceptions about how SIB relates to oneself and other people, underscoring the importance of individual and sociocultural factors in explaining the development and repetition of SA and NSSI; (ii) demonstrated 'moderate' to 'excellent' test retest reliability over 2-4 weeks, consistent with our aim to measure beliefs (relatively enduring personal meanings for SA and NSSI); and (iii) demonstrated small to moderate correlations with purportedly similar, existing SIB constructs, indicating that the SABS and NSIBS tap content that is not currently measured.

The incremental validity of the SABS and NSIBS was rigorously evaluated in a series of multivariate hierarchical regressions. As hypothesized, we found that the SABS predicted

additional variance in current suicidal thoughts and lifetime suicide attempts beyond a wide

range of variables, and the NSIBS predicted additional variance in lifetime NSSI thoughts

and lifetime NSSI beyond a wide range of variables. The predictive ability of the SABS and

NSIBS exceeded what is typically observed in stringent tests of incremental validity (Hunsley

& Meyer, 2003), evidencing the novelty and value of each new instrument. It is especially

noteworthy that the predictive ability of both scales was only marginally diminished when

controlling for the other scale (e.g., controlling for the NSIBS in analyses exploring the

incremental validity of the SABS), and that the SABS demonstrated stronger relationships

with markers of suicidal thinking than the NSIBS. These results were replicated across

samples and in different predictive models. They illustrate the relative specificity of each

instrument and further evidence the conceptual distinction between SA and NSSI.

  The development of the SABS and NSIBS present a host of intriguing findings. Item

generation was guided by the broad hypothesis that SICs are characterized by positive,

negative, and facilitating SICs. Most of the subscales of the SABS and NSIBS appear to

measure positive SICs (perceived advantages of SIB). The SABS *Stigma* subscale (e.g.,

'People think that my suicide attempt(s) are selfish') and NSIBS *Problematic* (e.g., 'NSSI

makes my problems worse') and *Stigma* (e.g., 'People judge and criticise my NSSI')

subscales appear to measure negative SICs (perceived disadvantages of SIB). However, the

items of the SABS and NSIBS clearly demonstrate that people perceive SA and NSSI

idiosyncratically, so it seems conceivable that different individuals may construe the same

items differently, as an advantage or a disadvantage.

  Each instrument contains a *Stigma* factor, which taps beliefs that other people do not

respond empathically to SA/NSSI and instead judge, criticise, or punish these behaviors.

Endorsing this subscale, for instance, along with the *Dependence* subscale, would indicate

that an individual perceives that SA and/or NSSI are their only and/or best option for self-regulation, even though engaging in these behaviors alienates them from significant others.

The NSIBS *Anti-suicide* subscale highlights the fact that some individuals believe that NSSI is a useful and possible means of avoiding acting on suicidal thoughts. However, as perceptions can quickly change, and NSSI can result in accidental death[5], we stress that *endorsing this subscale cannot be interpreted as a strong or stable protective factor*.

The SABS *Belonging* subscale illustrates that some individuals believe that SA will potentially help them connect with others, as do some items of the SABS *Dependence* subscale (e.g., 'My life would be worse without suicide attempts'). These and other somewhat counterintuitive SABS items could potentially suggest that when asked about SA, people may actually have responded in relation to SA or thinking or talking about killing oneself (despite our efforts to minimize ambiguity and misunderstanding of terminology (see Definitions of Key Constructs section).

Conceptual Debate

We presented a range of findings which indicate that the SABS and NSIBS can be understood as distinct measures and that SA and NSSI are similar, related, but ultimately separate phenomena. The implications of these findings are far-reaching as they support the use of separate terminology and definitions of SA and NSSI, and indicate that SA and NSSI need to be distinguished in research and clinical practice. Whether SA and NSSI are separate is perhaps analogous to beliefs about different illicit drugs. A regular drug user could quite conceivably hold a similar belief about two different drugs, believing, for instance, that cannabis and heroin both help them alleviate distress. However, as a result of particular internal or external factors, that person may strongly endorse this particular belief about heroin and only mildly endorse it for cannabis. The person may also use heroin more

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[5] For example, lethality of SIB method can indicate suicidal intent, but not always or reliably. Brown et al. (2004) found a minimal association between suicide intent and medical lethality

regularly than they use cannabis. Just like beliefs about cannabis versus heroin, our analyses demonstrate that beliefs about SA and NSSI are separate – a fact which does not mean that SA and NSSI cannot co-occur[6], relate to one-another, both be activated or enacted within a short time period, be underpinned by similar mechanisms, or respond to the same interventions. These are empirical questions.

Clinical Utility

We are hopeful that the SABS and NSIBS will be useful to researchers and clinicians alike. We retained a subset of items from each factor (see Tables 1 and 2) because this seemed most appropriate given the psychology of people who are considering SA and NSSI. Those interested in focusing on particular subscales are advised to use the full set of items from each subscale, as these will of course be more internally consistent and tap each construct more completely.

When used clinically, we advise that the SABS and NSIBS are used to facilitate collaborative, close questioning regarding what SA and/or NSSI idiosyncratically *means* to each individual. This information can be coupled with theory and clinical and contextual information to make individualised predictions about risk and to formulate targeted therapeutic interventions. Clinicians are advised to explore *why* respondents endorse particular SABS and NSIBS items and to link SA and NSSI cognitions to other presenting problems. A section is included at the end of the SABS and NSIBS to record important beliefs and cognitions about SA and NSSI that are not included in each scale. Given the extensive nature of our item generation, it is likely that most responses will be similar to items that featured in our item pools. If this is the case, the clinician will be able to glean an idea of which factor particular cognitions are likely to stem from. We are in the process of developing child and adolescent versions of the SABS and NSIBS as well as brief versions of

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[6] Usually defined in the literature as occurring in the same person ever (lifetime) or in the past year.

each instrument that can be used in epidemiological research or clinical settings where a screening measure is more desirable and practical.

Limitations and Future Directions

We see our results as promising but further research is needed to explicate the psychometric properties of the SABS and NSIBS. The factor structures and validation analyses reported here must be independently replicated in diverse samples (e.g., samples recruited from clinical settings, demographically and culturally diverse samples). The fact that Sample 5 served as an instrument development and validation sample is a potential limitation, although we note that our EFA results were near identical across samples 3-5, which suggests that we can be reasonably confident that our validation analyses were conducted in relation to the final scales (as per Sample 6 analyses).

The utility of any measure of SICs particularly stems from an ability to predict future behavior, which we were unable to explore here. Future research is therefore urgently needed to test whether, under what circumstances, and for whom, SA and NSSI beliefs drive subsequent SA and NSSI behavior. Research is also needed to explicate the presumably dynamic relationship between mood changes, information-processing biases, and the activation and deactivation of SICs, and whether endorsement of these measures changes as a result of interventions.

It is not clear at this stage why several subscales of the SABS and NSIBS demonstrated negative relationships with SA and NSSI thoughts and behavior in our multivariate regressions. The *Belonging* and *Revenge* SABS subscales demonstrated negative relationships with current suicidal thoughts and lifetime SAs, and the *Interpersonal influence*, *Dependence*, and *Belonging* NSIBS subscales demonstrated negative relationships with lifetime NSSI thoughts and behaviour. Further research is needed to replicate and clarify these relationships.

Another important area for future research involves exploring the potential existence and role of facilitating SICs, which failed to emerge as a distinct factor in our structural analysis. Intriguingly, these items were frequently endorsed for both SA and NSSI (see Supplementary material: Table S24), indicating that they may have a potentially important role to play in both types of SIB. We believe that facilitating cognitions did not emerge distinctly in our structural analyses because they likely take the form of 'automatic thoughts' (see Beck & Haigh, 2014) and are therefore more idiosyncratic and situation and person-specific than the beliefs measured by the SABS and NSIBS, and because they probably originate from positive SICs.

Conclusion

When a clinician encounters someone who is contemplating or has engaged in some form of SIB, they need to assess the precise details of exactly what that person is thinking, and, where relevant, the details of the SIB itself. Understanding the specific content of each individual's SICs would seem to be a vital prerequisite to accurate and effective risk assessment, formulation and management, prediction, and interventions. However, to date SIB research and practice both appear to have been hindered by the use of a diverse range of different terminology, inconsistent use of terminology (using the same term to mean different things), and different conceptualizations of the core constructs. These issues in large part seem to stem from how SA and NSSI are conceptualized and there has been much debate regarding whether SA and NSSI are best understood as one construct or two separate, related constructs. We presented a range of findings which indicate that SA and NSSI should be understood and measured as distinct multidimensional constructs. We hope that the development of the SABS and NSIBS will prove to be of value to clinicians and researchers alike by unifying the field somewhat in its understanding and measurement of the basic constituent elements of SICs.

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Table 1. *Promax-rotated Loadings of Cognitions about Attempting Suicide in Sample 5*

	Factor loadings						
	1	2	3	4	5	6	7
1. *Belonging*							
Attempting suicide helps me fit in with other people	**.850**	.038	.042	-.085	-.082	.059	.073
Attempting suicide helps me get accepted by some people	**.848**	.052	.026	.110	-.018	-.048	-.070
Attempting suicide makes me feel part of a group	**.794**	-.011	.042	-.027	-.085	.060	.048
Attempting suicide helps me connect with other people	**.771**	.015	-.048	.125	.061	.003	-.042
Other people accept me because of my suicide attempt(s)	**.701**	.028	.036	-.026	.121	-.083	.007
2. *Stigma*							
People think that my suicide attempt(s) are selfish	.019	**.863**	-.057	.007	.012	.038	.008
People judge and criticise my suicide attempt(s)	.055	**.800**	.009	-.034	-.002	.106	-.034
People think that my suicide attempt(s) are abnormal	.007	**.789**	-.040	.043	.036	-.040	.002
People punish my suicide attempt(s)	.076	**.710**	.015	-.159	-.093	.119	.173
Attempting suicide damages important relationships in my life	-.059	**.688**	.091	.021	.022	-.114	.083
Attempting suicide leads to unwanted attention from other people	.034	**.595**	.016	.099	.090	-.059	-.127
3. *Self-punishment*							
I attempt suicide because I deserve to suffer	.006	-.021	**1.010**	-.038	-.015	-.038	-.045
I attempt suicide to punish myself	.008	.034	**.925**	-.152	.056	-.111	.096
I deserve suicide attempt scars and injuries	.125	.055	**.800**	.002	-.045	.012	-.162
I attempt suicide to show how much I hate myself	-.004	-.068	**.728**	.135	.036	.031	.020
I attempt suicide because I am worthless and unlovable	-.073	.168	**.566**	.141	-.092	.210	-.080
Attempting suicide is a way to express anger or self-criticism	-.100	.014	**.402**	.067	.180	-.035	.319
4. *Eliciting help*							
Attempting suicide makes people take my problems seriously	.003	.003	-.125	**.899**	.050	-.023	-.025
Attempting suicide makes other people help me	.077	-.043	.009	**.877**	-.071	.020	-.079
Attempting suicide makes other people understand how distressed I am	-.060	.045	.021	**.742**	.005	-.034	.124
Attempting suicide shows other people how distressed I feel	-.057	.115	.112	**.697**	-.040	.030	.024
Attempting suicide makes people care about me	.199	-.092	.012	**.609**	.015	-.042	.101
5. *Escape*							
Attempting suicide changes the way that I am thinking	.039	.094	-.020	-.078	**.885**	-.229	-.010
Attempting suicide clears my mind	.061	-.031	.048	-.087	**.775**	.061	-.048
Attempting suicide changes my thoughts so the problems in my life do not seem as bad	.001	-.038	-.066	.078	**.762**	-.059	.078

Attempting suicide helps me forget my problems	.031	-.089	.056	.061	**.666**	.138	-.064
Attempting suicide stops upsetting thoughts going round and round in my mind	-.145	.104	-.039	.069	**.607**	.193	-.085
Attempting suicide temporarily stops me from feeling anything	-.010	.182	.127	.016	**.484**	.087	-.112
6. *Dependence*							
Attempting suicide is the only option I have for solving my problems	-.099	.110	-.024	.091	-.138	**.830**	-.068
Attempting suicide is the only method of coping that works for me	.050	.020	-.030	-.069	.043	**.786**	-.068
My life would be worse without suicide attempts	.252	-.150	.118	-.042	.039	**.447**	.035
Attempting suicide makes my life better	.263	-.092	-.126	-.035	.219	**.432**	.081
Attempting suicide is the only thing I've got that's just mine	-.001	-.042	.068	-.101	.124	**.431**	.292
Attempting suicide is the only way to control upsetting pictures and images that go through my mind	-.114	.069	.089	-.009	.301	**.428**	.000
7. *Revenge*							
Attempting suicide is a way to get back at people who have hurt me	-.020	-.031	.021	.025	-.114	.036	**.874**
Attempting suicide is a way to intentionally upset other people	.147	.098	-.096	-.018	-.027	-.097	**.674**
Attempting suicide shows other people that they were wrong	.075	-.021	-.035	.176	-.038	.125	**.580**
Attempting suicide is a form of rebellion	.188	.034	-.031	.042	.109	-.149	**.514**
Attempting suicide stops other people from forcing me to do things	.074	.022	.013	.205	.117	.066	**.287**

Note. The highest factor loading for each item is highlighted. Underlined items form the final version of the Suicide Attempt Beliefs Scale (SABS).

Table 2. *Promax-rotated Loadings of Cognitions about Nonsuicidal Self-Injury (NSSI) in Sample 5*

	Factor loadings									
	1	2	3	4	5	6	7	8	9	10
1. *Escape*										
NSSI helps me escape negative emotions	**.856**	-.053	-.003	-.068	-.073	.012	.038	.045	-.025	.029
NSSI provides relief from upsetting thoughts or feelings	**.828**	.005	-.014	-.101	.055	-.016	.028	-.033	-.054	.045
NSSI makes me feel less upset	**.655**	-.090	.051	.024	.024	-.003	-.060	.030	.116	-.005
NSSI reduces tension and stress	**.618**	-.061	-.067	.044	-.080	.056	.027	.026	.295	-.089
NSSI helps me escape feeling defeated or helpless	**.577**	.061	.106	.051	-.014	-.057	-.009	.047	.039	.028
NSSI helps me escape from my problems	**.567**	.037	.014	.046	.010	.159	.035	-.009	.059	-.001
NSSI temporarily stops me from feeling anything	**.464**	.049	-.067	-.054	.096	.060	.083	-.024	-.007	.154
NSSI stops me thinking about upsetting pictures and images	**.442**	.095	.078	.073	.174	.086	-.093	-.058	-.113	-.012
2. *Self-punishment*										
I engage in NSSI because I deserve to suffer	-.107	**.848**	.005	-.058	.041	.092	-.041	.009	.004	.026
I use NSSI to punish myself	-.021	**.839**	.031	-.016	-.032	.019	.041	-.053	-.021	-.020
NSSI is an expression of my self-hatred	.078	**.836**	-.030	.039	-.046	-.072	.076	-.013	-.025	.006
I engage in NSSI to show how much I hate myself	-.043	**.834**	-.022	.088	-.027	-.071	.018	.031	.050	.006
I engage in NSSI because I am worthless and unlovable	.009	**.726**	.016	-.034	.084	.070	-.061	.046	-.071	-.018
I deserve NSSI scars and injuries	-.120	**.614**	.002	-.146	.033	.207	-.086	.063	.110	.113
NSSI is a way to express anger or self-criticism	.258	**.567**	.017	.136	-.055	-.095	.130	-.059	.026	-.121
3. *Anti-dissociation*										
NSSI stops me feeling numb	.001	.053	**.913**	-.020	-.056	-.020	.000	-.057	-.018	.006
NSSI is a way to feel something when I otherwise feel nothing	-.079	.076	**.845**	-.059	-.002	-.042	-.034	.069	.015	.034
NSSI stops me feeling detached from myself	.048	-.054	**.826**	.025	-.016	.007	.007	.006	-.101	.025
NSSI takes me out of a detached state	.054	-.105	**.818**	.039	-.065	.099	.064	-.005	-.055	-.061
NSSI shocks my body so I begin feeling again	.026	.017	**.757**	.037	.045	-.022	-.002	-.007	.011	-.008
NSSI makes me feel 'real' or alive	.014	.042	**.634**	-.025	.037	-.054	-.040	.023	.185	-.016
4. *Interpersonal influence*										
NSSI is a way to intentionally upset other people	-.066	-.007	-.117	**.720**	.066	.016	-.031	.019	.010	-.023
NSSI makes people sorry for the way they treated me	.007	-.051	-.003	**.719**	.019	.005	-.005	.035	-.004	.034
NSSI makes people care about me	-.002	.032	.047	**.711**	-.023	-.015	-.039	.030	.024	.033
NSSI makes people take my problems seriously	.004	.054	.120	**.691**	.018	-.030	.009	-.005	-.033	-.104
My NSSI persuades other people to change their mind	.013	-.021	-.048	**.649**	-.008	.042	.057	-.043	.015	.136
NSSI stops important people in my life from leaving or abandoning me	-.047	.013	.009	**.647**	-.016	.155	.028	-.042	-.006	.046
5. *Stigma*										
People reject me because of my NSSI	-.058	-.012	-.026	.044	**.833**	.063	-.006	-.065	-.076	.012
People judge and criticize my NSSI	.032	-.042	-.052	.020	**.833**	-.096	.022	.064	.034	-.035
People punish my NSSI	-.030	.038	-.008	.049	**.787**	.036	-.117	-.090	-.058	.040

People think that my NSSI is selfish	.021	-.001	.016	-.017	**.787**	-.043	.014	.030	-.047	.038
People think that my NSSI is abnormal	.127	-.019	-.029	-.026	**.587**	-.073	.122	.030	.081	-.090
People do not understand my NSSI	.143	.117	.059	-.081	**.462**	-.022	.049	.074	.031	-.054

6. *Dependence*

I cannot cope without NSSI	.034	-.002	-.013	-.001	-.038	**.909**	-.058	-.029	-.042	-.006
NSSI is the only method of coping that works for me	.156	-.046	.062	.018	-.014	**.772**	-.077	.006	-.054	-.045
My NSSI will get worse	-.084	.086	-.011	.024	-.054	**.704**	.107	.013	-.025	.025
My problems are so serious that NSSI is the only option	.131	-.038	.008	.111	.074	**.590**	-.047	.091	-.088	-.021
I need to always have NSSI as an option in my life	.045	.071	-.042	.032	.004	**.548**	-.147	.085	.163	-.059
I feel on edge if I don't engage in NSSI	.156	.091	-.065	-.012	.024	**.415**	.044	-.046	.236	-.018

7. *Problematic*

NSSI makes my problems worse	-.200	.005	.008	.041	.002	-.071	**.772**	.022	.161	-.012
My life would be better without NSSI	.197	.051	-.041	.002	-.059	-.269	**.715**	.011	-.142	.019
NSSI is destructive	.074	.021	-.022	.049	.033	-.123	**.601**	.054	.019	-.021
NSSI creates a lot of problems for me	-.155	-.072	.033	-.030	.236	.171	**.584**	-.032	.137	-.034
I hate my NSSI injuries	.151	.043	.057	-.054	-.107	.167	**.563**	-.036	-.276	.028
NSSI has ruined my life	-.090	-.025	.013	-.043	.048	.410	**.547**	-.014	-.056	.060

8. *Anti-suicide*

NSSI is a compromise instead of killing myself	-.032	-.011	-.042	.006	-.056	.058	.074	**.888**	.013	-.007
NSSI is a replacement for suicidal behavior	.015	.019	.019	-.044	-.051	-.004	-.006	**.861**	-.013	.035
I deliberately use NSSI to avoid acting on suicidal thoughts	.002	-.015	.052	-.044	.093	.060	-.040	**.794**	-.067	.028
NSSI lets me express my suicidal thoughts without risking death	.066	.036	-.005	.100	-.009	-.043	.001	**.745**	.010	-.036

9. *Enjoyable*

NSSI is enjoyable	.057	.037	-.106	.010	-.028	-.059	-.060	.021	**.808**	-.060
NSSI is satisfying	.285	.043	-.037	-.059	-.090	.005	.042	-.014	**.640**	-.048
NSSI is uplifting	.224	-.056	.002	-.047	-.031	.078	-.102	-.082	**.564**	.101
NSSI leaves me feeling energized	.101	-.015	.176	.045	.058	-.052	-.076	-.050	**.504**	.058
NSSI makes me less bored	-.104	.017	.031	.210	-.049	-.030	.063	.030	**.488**	.111
NSSI gives me a 'high' that feels like a drug high	.028	-.062	.213	-.071	.120	.037	.105	-.012	**.453**	.022

10. *Belonging*

NSSI helps me fit in with other people	.011	.031	.001	.030	-.006	-.013	-.033	.008	-.006	**.841**
NSSI helps me get accepted by some people	.040	.053	-.036	.116	.025	-.081	.019	-.008	.022	**.751**
NSSI makes me more likeable	.034	-.074	.000	.079	-.089	.049	.041	.068	.060	**.640**
Other people accept me because of NSSI	.003	.020	.009	.110	-.020	.014	.001	-.045	-.043	**.620**
NSSI helps me connect with other people	.038	-.051	.026	.190	.100	-.062	-.009	.010	.005	**.594**

Note. The highest factor loading for each item is highlighted. Underlined items form the final version of the Nonsuicidal Self-Injury Beliefs Scale (NSIBS).

Table 3. *Confirmatory Factor Analytic and Exploratory Structural Equation Models of the Suicide Attempt Beliefs Scale (SABS) and Nonsuicidal Self-Injury Beliefs Scale (NSIBS)*

Model	X^2	df	BIC	TLI	CFI	SRMR	90% CI for RMSEA Lower	RMSEA	Upper
			Confirmatory Factor Analyses						
SABS									
Model 1. 7 factors	675.528***	278	62867.149	.930	.940	.053	.047	.052	.057
Model 2. Bifactor	1053.908***	273	63320.116	.864	.886	.098	.068	.072	.077
Model 3. 1 second-order factor	1104.455***	292	63302.895	.863	.877	.100	.068	.073	.077
Model 4. 2 second-order factors	988.344***	291	63165.730	.882	.895	.104	.063	.067	.072
Model 5: 1 first-order factor	3096.790***	299	65897.146	.519	.558	.127	.132	.136	.141
Model 6: 2 first-order factors	2439.614***	298	65001.634	.637	.667	.127	.114	.119	.123
NSIBS									
Model 1. 10 factors	1423.947***	657	91483.309	.925	.933	.055	.042	.045	.048
Model 2. 9 factors	1660.085***	666	91686.366	.904	.914	.058	.048	.051	.054
Model 3. Bifactor	1789.211***	663	91839.022	.891	.903	.082	.051	.054	.057
Model 4. 1 second-order factor	2036.916***	692	91638.414	.875	.883	.092	.055	.058	.061
Model 5. 2 second-order factors	1939.026***	691	91834.671	.884	.892	.116	.053	.056	.059
Model 6. 1 first-order factor	6764.763***	702	97401.912	.427	.457	.126	.121	.124	.127
Model 7. 2 first-order factors	5746.844***	701	96155.687	.528	.554	.138	.110	.112	.115
Similarly themed subscales									
Self-punishment 2 factors	116.719***	13	16791.346	.918	.949	.044	.108	.128	.150
Self-punishment 1 factor	379.438***	14	17195.270	.700	.800	.091	.224	.245	.267
Escape 2 factors	18.177***	19	20355.477	1.001	1.000	.018	.000	.000	.036
Escape 1 factor	577.477***	20	20978.399	.532	.666	.133	.205	.220	.236
Dependence 2 factors	102.847***	26	22715.648	.942	.958	.038	.057	.072	.086
Dependence 1 factor	513.206***	27	23153.547	.655	.741	.093	.161	.174	.187
Belonging 2 factors	7.733***	8	11579.490	1.00	1.00	.013	.000	.000	.052
Belonging 1 factor	275.261***	9	11892.280	.705	.823	.075	.210	.234	.258
Stigma 2 factors	54.103***	19	19922.562	.968	.978	.036	.042	.061	.080
Stigma 1 factor	472.795***	20	20387.292	.655	.753	.098	.184	.200	.216
SABS and NSIBS 1 scale									
17 factors	3627.533***	1879	153556.731	.905	.914	.052	.036	.038	.040
Bifactor	5898.166***	1950	155557.125	.793	.806	.106	.054	.056	.057
			Exploratory Structural Equation Modelling						
SABS 6 factors	590.067***	224	60915.450	.910	.946	.026	.045	.050	.055
SABS 7 factors	386.356***	202	60846.819	.950	.973	.020	.032	.037	.043
SABS 8 factors	301.695***	181	60879.330	.963	.982	.018	.026	.032	.038
NSIBS 9 factors	984.955***	518	92404.429	.933	.959	.020	.034	.037	.041
NSIBS 10 factors	735.335***	485	92360.735	.962	.978	.017	.024	.028	.032
NSIBS 11 factors	618.226***	453	92434.029	.973	.986	.014	.019	.024	.028
SABS and NSIBS 1 scale									
17 factors	3627.533***	1879	153556.731	.905	.914	.052	.036	.038	.040
Bifactor	5898.166***	1950	-	.793	.806	.106	.054	.056	.057

Note. *** = $p < .001$.

Table 4. *Means, Internal Consistency Reliabilities (Coefficient Alphas), Average Interitem Correlations (AICs), and Test Retest Reliabilities for the Suicide Attempt Beliefs Scale (SABS) and Nonsuicidal Self-Injury Beliefs Scale (NSIBS)*

Subscales (Number of Items)	Sample 3 (N = 484)				Sample 4 (N = 380)[1]			Sample 5 (N = 664; 130[2])					Sample 6 (N = 650; 135[2])				
	M	SD	ω	AIC	M	SD	ω	M	SD	ω	AIC	ICC	M	SD	ω	AIC	ICC
SABS (26 items)																	
Self-punishment (3 items)	4.83	1.75	.81	.58	4.59	1.98	.86	4.64	2.01	.86	.69	.73	4.65	2.01	.86	.68	.82
Escape (4 items)	4.20	1.58	.78	.46	4.17	1.80	.84	3.98	1.80	.82	.54	.67	4.01	1.75	.82	.53	.63
Dependence (5 items)	2.91	1.45	.82	.47	3.15	1.55	.84	2.96	1.48	.80	.44	.54	3.00	1.47	.80	.45	.63
Belonging (3 items)	1.88	1.13	.80	.57	1.93	1.32	.88	1.75	1.16	.84	.64	.49	1.73	1.11	.84	.64	.58
Revenge (4 items)	2.48	1.48	.81	.51	2.51	1.57	.83	2.27	1.46	.80	.54	.64	2.21	1.40	.80	.52	.69
Stigma (4 items)	5.08	1.39	.76	.43	4.55	1.70	.81	4.79	1.67	.83	.53	.67	4.73	1.73	.83	.55	.71
Eliciting help (3 items)	3.66	1.69	.79	.55	3.17	1.70	.81	3.29	1.71	.82	.59	.71	3.19	1.71	.82	.60	.66
Total score (range = 26-182)	92.68	24.44	.88	.22	89.74	53.15	.92	88.03	29.71	.92	.30	.70	87.48	29.36	.92	.30	.71
NSIBS (39 items)																	
Self-punishment (4 items)	5.50	1.65	.89	.67	5.08	1.72	.87	5.38	1.56	.88	.60	.68	5.39	1.57	.88	.63	.84
Dependence (4 items)	3.97	1.65	.82	.62	3.89	1.74	.83	4.10	1.65	.85	.53	.79	4.11	1.60	.82	.54	.81
Escape (4 items)	5.38	1.55	.85	.58	5.26	1.64	.90	5.37	1.50	.83	.55	.75	5.26	1.54	.83	.55	.74
Anti-dissociation (3 items)	5.15	1.71	.84	.63	4.78	1.78	.84	5.02	1.68	.84	.62	.73	4.91	1.72	.84	.64	.80
Problematic (5 items)	4.92	1.31	.77	.39	4.77	1.46	.83	4.95	1.38	.81	.42	.85	4.92	1.40	.81	.46	.83
Anti-suicide (3 items)	4.90	1.84	.86	.66	4.76	1.89	.88	4.92	1.85	.89	.70	.75	4.85	1.89	.89	.73	.82
Enjoyable (4 items)	4.09	1.67	.83	.54	3.70	1.68	.84	4.09	1.63	.82	.51	.71	4.09	1.62	.82	.53	.78
Belonging (3 items)	1.91	1.21	.83	.59	2.07	1.43	.86	1.90	1.26	.84	.65	.62	1.83	1.19	.84	.63	.69
Stigma (4 items)	5.33	1.40	.81	.51	4.83	1.61	.82	5.29	1.48	.83	.55	.76	5.21	1.50	.83	.54	.77
Interpersonal influence (5 items)	2.47	1.40	.84	.51	2.74	1.37	.85	2.32	1.32	.84	.51	.63	2.21	1.26	.84	.50	.82
Total score (range = 39-273)	169.91	36.28	.92	.22	162.10	78.07	.95	168.83	37.47	.92	.24	.77	166.66	36.25	.92	.22	.88

Note. ICC = Single Measure Two-Way Mixed Absolute Agreement Intraclass Correlation Coefficient of Test Retest Reliability. [1]It was not possible to compute an AIC for Sample 4 using multiply imputed data; [2]Denotes Time 2 sample sizes.