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# One-Year Test-Retest Reliability of the Inventory of Statements about Self-Injury (ISAS)

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## Abstract

Nonsuicidal self-injury (NSSI) is a growing public health problem among adolescents and young adults. The Inventory of Statements About Self-Injury (ISAS) is a self-report measure designed to assess NSSI behaviors and functions. The current study examines the one-year test–retest reliability of the ISAS in a sample of young adult self-injurers. Results indicate that the ISAS behavioral and functional scales demonstrate good stability over one year. For the behavioral scales, test–retest correlations ranged from .52 (biting) to .83 (burning), with a median of .68. For the functional scales, test–retest correlations were .60 for the superordinate intrapersonal functions scale and .82 for the superordinate interpersonal functions scale. Regarding individual functions, test–retest correlations ranged from .35 (affect regulation) to .89 (peer bonding), with a median of .59. Findings suggest the ISAS has good test–retest reliability and contributes to the growing literature on the psychometric properties of the ISAS.

## Keywords

nonsuicidal self-injury, deliberate self-harm, functional assessment, test–retest reliability, psychometric properties

Nonsuicidal self-injury (NSSI; e.g., cutting) refers to the deliberate, self-inflicted destruction of body tissue without suicidal intent (Nock & Prinstein, 2004; Whitlock, Eckenrode, & Silverman, 2006). Recent research indicates that 14% to 17% of adolescents and young adults have engaged in NSSI, suggesting the need to improve understanding, prevention, and treatment of the behavior (Ross & Heath, 2002; Whitlock et al., 2006). High rates of NSSI are particularly alarming due to the behavior's association with severe psychopathology, including depression, anxiety, eating disorders, borderline personality disorder, and suicide (Klonsky, Oltmanns, & Turkheimer, 2003; Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006).

A functional assessment of NSSI is vital for understanding the behavior's etiology and developing effective treatments. Many instruments used for measuring NSSI functions have been limited in the scope of NSSI functions assessed and have lacked data on reliability and validity. The Inventory of Statements About Self-Injury (ISAS; Klonsky & Glenn, 2009) is a self-report instrument created to address these limitations. It was designed to comprehensively assess NSSI functions previously reported in the empirical literature (Klonsky, 2007) as well as several other potential functions (Klonsky & Glenn, 2009). The ISAS is also psychometrically sound (Klonsky & Glenn, 2009); its 13 individual functional scales are well represented by a two-factor structure (i.e., intrapersonal and

interpersonal—accounting for 61% of variance), consistent with previous research on NSSI functions (Nock & Prinstein, 2004). Intrapersonal ( $\alpha = .80$ ) refers to functions that are self-focused, such as affect regulation, whereas interpersonal ( $\alpha = .88$ ) refers to functions that are other-focused, such as peer bonding. In addition to the functional scales, the ISAS assesses lifetime frequency of 12 different NSSI behaviors. These behavioral scales have demonstrated good internal consistency ( $\alpha = .84$ ) and short-term (1–4 weeks) test–retest reliability ( $r = .85$ ). The ISAS behavioral and functional scales have exhibited good construct validity as indicated by theoretically consistent relationships to other NSSI and clinical variables (Klonsky & Glenn, 2009; Klonsky & Olino, 2008).

However, the test–retest reliability of the ISAS has been inadequately examined. No study to date has examined test–retest reliability of the functional scales. Regarding the behavioral scales, nothing is known about test–retest reliability over intervals longer than 4 weeks. The current study addresses

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this gap by examining one-year test–retest reliability of the ISAS behavioral and functional scales in a sample of young adult self-injurers. Because the ISAS is designed to measure *lifetime* NSSI frequency and functions rather than recent or specific NSSI episodes, we expect ISAS scores to exhibit high test–retest reliability over one year.

## Method

### Participants and Procedure

Eighty-one undergraduates from lower-level psychology courses who screened positive for NSSI were recruited for a larger study on NSSI. At T1 (baseline), participants' NSSI was confirmed with the ISAS. All 81 self-injurers recruited at T1 agreed to be contacted for a follow-up study one year later. (For more information on T1 recruitment and demographics, see Glenn & Klonsky, 2010.) One year later ( $M = 380.6$  days,  $SD = 41.4$ ), 51 (63.0%) of the original 81 self-injurers participated in the T2 assessment. The self-injuring sample at T2 had an average age of 19 years ( $SD = 1.6$ ) and was mainly female (72.5%) and Caucasian (54.9%). The 51 self-injurers who participated in the T2 assessment did not differ significantly from the 30 who did not participate on any demographic or clinical variables ( $ps$  ranged from .36 to .72). At T2, participants completed the ISAS a second time.

### Measures

*Inventory of Statements About Self-Injury (ISAS)*. The frequency and functions of NSSI were measured using the ISAS (Klonsky & Glenn, 2009; Klonsky & Olino, 2008). The first section of the ISAS measures the lifetime frequency of 12 NSSI behaviors performed “intentionally (i.e., on purpose) and without suicidal intent” (see Table 1 for a complete list of ISAS behaviors). The second section of the ISAS assesses 13 functions of NSSI that fall into two superordinate categories: intrapersonal and interpersonal functions (see Table 2 for a complete list of ISAS functions). Each subscale is assessed with three items rated on a scale from 0 = *not at all relevant* to 2 = *very relevant* to one's experience of NSSI. The intrapersonal and interpersonal superordinate scale scores are created by averaging the relevant subscale scores. Thus, the subscale and superordinate scale scores range from 0 to 6.

### Results

Data from the 51 self-injurers who participated at both T1 and T2 were used to examine one-year test–retest reliability of the ISAS behavioral and functional sections. First, test–retest stability of the 12 ISAS behaviors was examined. Because of the outliers in NSSI frequency, Spearman rather than Pearson correlations were used to examine stability of

the behavioral scales from T1 to T2 (see Table 1). Test–retest correlations for the 12 NSSI behaviors ranged from .52 (biting) to .83 (burning), with a median of .68 (all  $ps < .001$ ). The mean frequency of some behaviors (e.g., pinching, pulling hair) increased greatly between T1 and T2 assessment; however, paired-samples  $t$ -tests suggest that the differences were due to outliers as none were statistically significant ( $ps$  ranged from .08 for swallowing chemicals to .78 for burning).

Next, Pearson correlations were used to examine one-year stability of the 13 ISAS functional subscales and two superordinate functional scales (see Table 2). Test–retest correlations for all subscales were positive and statistically significant, ranging from .35 (affect regulation) to .89 (peer bonding), with a median of .59 (all  $ps < .02$ ). Interpersonal functions ( $r = .82$ ) exhibited higher stability than intrapersonal functions ( $r = .60$ ), a difference that was statistically significant ( $p < .05$ ). Because test–retest stability was lowest for affect regulation, which is also the most common function of NSSI (Klonsky, 2007), we separately examined test–retest stability for participants who had versus had not engaged in NSSI during the previous year, but found no difference when comparing these correlations ( $p = .66$ ).

Paired-samples  $t$ -tests were then conducted to examine changes in mean endorsement of NSSI functional scales between T1 and T2. Endorsement of intrapersonal functions exhibited a modest but nonsignificant decrease between T1 and T2,  $t(50) = 1.89$ ,  $p = .07$ . There was a significant decrease in the endorsement of interpersonal functions,  $t(50) = 3.07$ ,  $p = .003$ ; however, this pattern appeared to be explained by decreased endorsement of the toughness subscale,  $t(50) = 3.04$ ,  $p = .004$ . No other subscales differed significantly between T1 and T2 assessment ( $ps$  ranged from .07 for self-care to .94 for self-punishment).

### Discussion

This is the first study to examine the long-term test–retest reliability of the ISAS, a self-report measure of NSSI behaviors and functions. Findings indicate that the ISAS behavioral and functional scales demonstrate good test–retest stability over one year. Taken together with previous psychometric investigations of the ISAS (Klonsky & Glenn, 2009; Klonsky & Olino, 2008), findings support the ISAS as a reliable and valid measure of NSSI behaviors and functions.

Findings also have conceptual implications for understanding the measurement of NSSI. Results suggest that self-injurers' reports of NSSI frequency and functions are relatively stable over time. The behaviors exhibiting greatest stability were burning, banging/hitting, pulling hair, and cutting. Burning and cutting are two of the most common and clinically severe NSSI behaviors (Ross & Heath, 2002). Our findings suggest that individuals are able to provide

**Table 1.** Descriptive Statistics and one-Year Test–Retest Correlations for the ISAS Behavioral Scales ( $n = 51$ )

NSSI behaviors <sup>a</sup>	Time 1 (T1)			Time 2 (T2)			Correlation ( $r$ ) between T1 and T2 NSSI behaviors <sup>b</sup>
	Mean (SD)	Median	Range	Mean (SD)	Median	Range	
Cut	59.1 (161.2)	15.0	1,000	44.4 (80.9)	10	400	.75
Bite	23.3 (80.7)	1.0	500	12.2 (27.4)	0	150	.52
Burn	5.8 (17.7)	0	100	6.6 (18.6)	0	100	.83
Carve	1.0 (2.7)	0	15	3.2 (9.9)	0	50	.54
Pinch	35.6 (142.4)	0	1,000	2170.5 (14042.6)	0	100,000	.57
Pull Hair	24.6 (54.6)	2	300	2001.7 (13997.6)	0	100,000	.78
Severe Scratch	28 (87.4)	0	500	75.2 (215.3)	0	1,000	.69
Bang/Hit	34.8 (80.0)	6	500	1994.0 (13998.2)	5	100,000	.78
Interfere With Wounds	43.7 (98.9)	0	500	76.8 (309.7)	0	2,000	.68
Rub Skin	10.4 (56.3)	0	400	198.3 (1400.0)	0	10,000	.57
Stick Self With Needles	5.2 (16.8)	0	100	6.4 (17.5)	0	100	.67
Swallow Chemicals	7.5 (26.9)	0	155	0.8 (2.3)	0	10	.64

Note. ISAS = Inventory of Statements About Self-Injury; NSSI = nonsuicidal self-injury.

a. Some NSSI behaviors, such as pinching, pulling hair, and banging/hitting self, are performed habitually many times a day for years, and therefore result in very high estimates regarding lifetime frequency. Therefore, for some behaviors, there are extreme outliers leading to very high means and standard deviations.

b. Because of the significant outliers in the frequency of NSSI behaviors, test–retest stability of the ISAS behavioral scales was computed using Spearman correlations. All correlations between T1 and T2 NSSI behaviors were significant at  $p < .001$ .

**Table 2.** Descriptive Statistics and one-Year Test–Retest Correlations for the ISAS Functional Scales ( $n = 51$ )

ISAS function scales <sup>a</sup>	Time 1 (T1), Mean (SD)	Time 2 (T2), Mean (SD)	Correlation ( $r$ ) between T1 and T2 NSSI function scales
Intrapersonal functions total scale	2.74 (1.21)	2.46 (1.16)	.60***
Affect Regulation	4.55 (1.55)	4.22 (1.54)	.35*
Anti-Dissociation	2.25 (2.02)	1.88 (1.81)	.60***
Anti-Suicide	1.57 (1.69)	1.20 (1.78)	.65***
Marking Distress	2.24 (1.82)	1.92 (1.82)	.51***
Self-Punishment	3.10 (1.93)	3.08 (1.99)	.52***
Interpersonal functions total scale	0.91 (0.84) <sup>b</sup>	0.71 (0.70) <sup>b</sup>	.82***
Autonomy	0.55 (1.21)	0.39 (0.94)	.41**
Interpersonal Boundaries	0.84 (1.50)	0.54 (1.33)	.59***
Interpersonal Influence	0.96 (1.37)	0.94 (1.24)	.69***
Peer Bonding	0.29 (1.10)	0.20 (0.94)	.89***
Revenge	0.82 (1.41)	0.73 (1.34)	.50***
Self-Care	1.10 (1.39)	0.80 (1.47)	.70***
Sensation Seeking	0.88 (1.40)	0.78 (1.22)	.44**
Toughness	1.86 (1.64) <sup>b</sup>	1.28 (1.57) <sup>b</sup>	.64***

Note. ISAS = Inventory of Statements About Self-Injury; NSSI = nonsuicidal self-injury.

a. ISAS total scale and subscale scores range from 0 to 6.

b. Paired-samples  $t$ -tests indicate a significant difference ( $p < .05$ ) between T1 and T2 functional scores.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

consistent reports about their engagement in these behaviors, which is important for NSSI assessment in both clinical and research contexts.

Regarding NSSI functions, reports of both intrapersonal and interpersonal functions exhibited high stability, although intrapersonal functions were moderately less stable than

interpersonal functions. Notably, affect regulation, which is consistently reported to be the most frequently endorsed function for NSSI (for a review, see Klonsky, 2007), displayed the lowest test–retest stability of all functions. A post hoc analysis revealed that the stability of affect regulation was not influenced by recency of NSSI or by outliers. It will be

important for future research to investigate this issue further. Mean endorsement of functions remained consistent with the exception of toughness (e.g., engaging in NSSI to show I can take the pain), which was endorsed less often at follow-up compared with baseline. It is possible that individuals habituate to self-injury over time and become less likely to view it as a test of toughness or pain tolerance.

Limitations from this study suggest areas for future research. The sample's size and nature placed limits on the scope and generalizability. For instance, the sample size was not large enough to attempt to replicate the superordinate factor structure of functional scales previously reported in Klonsky and Glenn (2009). In addition, the sample was composed of young adults from an undergraduate sample who were mainly female and Caucasian. Future studies should further examine psychometric properties in samples that are larger, more demographically diverse, and show a wider range of clinical symptoms. Finally, this study aimed to investigate the test reliability of a measure of lifetime NSSI behaviors and functions and thus does not address the nature or assessment of changes in NSSI over time. Temporal changes in NSSI behaviors and functions represent an important focus for future research.

### Declaration of Conflicting Interests

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