*Estimates of the Reliability and Criterion Validity
of the Adolescent SASSI-A3*

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This summary provides information on the reliability and validity of the third version of the Adolescent SASSI, the SASSI-A3 (*Substance Abuse Subtle Screening Inventory-A3*). The SASSI-A3 is a psychological screening measure designed to screen people who are 13 to 18 years of age for substance use disorders. The first version of the Adolescent SASSI was designed to identify chemically dependent adolescents; it was published in 1990. The second version, SASSI-A2, was published in 2001 with additional scales and improved accuracy and has been used in many diverse types of service programs, including addictions and other types of adolescent treatment programs, as well as correctional settings. The research conducted to develop the original Adolescent SASSI is reported in the Adolescent SASSI Manual (Miller, 1990) and for the second version in the SASSI-A2 Manual (Miller & Lazowski, 2001). The ongoing program of research at the SASSI Institute, in tandem with the expressed needs of counselors and other treatment providers, prompted the development of a research version of the Adolescent SASSI-A2 that was used to develop the SASSI-A3. The research version included all the previous items on the Adolescent SASSI-A2, along with the addition of new items and updated language reflecting current teen drug-use trends. The research instrument was completed by 1065 participants from 19 substance use treatment programs, criminal justice, social service programs and community respondents.

The primary findings of the validation research on our newly revised SASSI-A3 are as follows:

1) The Adolescent SASSI-A3 was found to produce reliable results using both test-retest and internal consistency methodologies. Test-retest stability coefficients for the scales used in SASSI-3 scoring ranged from .61 to .80 with an overall stability coefficient of .83. The overall omega coefficient was .88; with omega coefficients on the individual scales used in the decision rules ranging from .64 to .95.

2) The overall accuracy of the Adolescent SASSI-A3 in distinguishing teens with a substance use disorder from those without a substance use disorder was 89%.

3) The overall accuracy of the SASSI-A3 decision rule was not significantly affected by respondents' gender, age, ethnicity, education, employment status, respondents' living situation, nor prior history of law violation.

Method

In this validation research study, the responses of 1065 participants were used to develop and examine various aspects of the Adolescent SASSI-A3. Forty-eight percent (*n* = 515) of these participants were from substance use treatment programs, criminal justice and social service programs throughout the United States and the remaining 550 respondents constituted our normative sample collected via KnowledgePanel®, a probability-based web panel designed to be representative of the United States. The various treatment programs provided the SASSI Institute with completed SASSI administrations via SASSI Online along with a completed symptom checklist and independent of SASSI results, their own clinical diagnosis of the presence or absence of an SUD. The criterion measure used to develop and evaluate the accuracy of the Adolescent SASSI-A3 was a DSM-5 based (APA, 2013) diagnosis concerning the presence or absence of a substance use disorder.

The responses of the 515 clinical respondents were used to develop and cross-validate the SASSI-A3 decision rules. These 515 respondents were divided randomly into two sub-samples, with the provision that the sub-samples contain approximately equal numbers of cases diagnosed as having or as not having a substance use disorder. One of the sub-samples (hereafter referred to as the development sample) was used to develop the Adolescent SASSI-A3 classification rules; the other (hereafter called the cross-

validation sample) was reserved and later used to assess the accuracy of the newly derived rules. Demographic characteristics of participants in these two samples are displayed in Table 1.

Overall and Scale Reliability

Two-week test-retest stability data were obtained from a sample of 107 respondents. The stability coefficients for the scales used in these rules ranged from .61 to .80. In 98% of the cases, the results of the SASSI-A3 decision rule did not change between the first and second administrations. The internal consistency coefficient (i.e., "coefficient omega") for the Adolescent SASSI-A3 inventory (based on a larger sample of respondents with complete scale scores; $n = 515$) was found to be .88 (see Table 2).

The SASSI-A3 items were selected and the scales were developed to maximize accuracy in identifying individuals with substance use disorders. Since the SASSI-A3 is not based on any theory or unitary construct that may underlie the etiology of substance use disorders, the reliability of measures of scale score stability can be viewed as more robust than the coefficient omega statistic for individual SASSI scales.

SASSI-A3 Accuracy Identifying those with a Substance Use Disorder

The results of the Adolescent SASSI-A3 were compared to diagnoses obtained from clinicians. Table 3 displays the results obtained with the overall sample. Accuracy levels obtained using the development and cross-validation samples respectively, were 84% and 93%, producing an overall accuracy of 89%. The sensitivity of the Adolescent SASSI-A3 (i.e., the percentage of respondents diagnosed as having a substance use disorder who were test positive on the SASSI-A3) was 83% in the development sample and 98% in the cross-validation sample, for an overall sensitivity of 90%. The specificity (i.e., the percentage of respondents diagnosed as not having a substance use disorder who were test negative on the SASSI-A3) was 86% in the development sample and 85% in the cross-validation sample, for an overall specificity of 85%.

Accuracy of the SASSI-A3 Decision Rule Across Different Types of Assessment Settings

Eighty-two percent of the respondents were from substance use treatment programs and 18% were from other settings such as criminal justice settings and social service programs. Accuracy was not appreciably affected by type of setting (substance use treatment programs 88% versus 90%, respectively).

The Influence of Demographic Factors on Accuracy

We also explored the influence of demographic factors on the accuracy of the Adolescent SASSI-A3 results. Findings indicated that the accuracy of the SASSI-A3 was not significantly affected by gender, age, ethnic group membership, education, employment status, nor prior history of law violation. Accuracy rates for males and females were 88% and 89%. Accuracy rates ranged by age group from 82% to 96% (see Table 4); by racial or ethnic group from 83% to 94% (see Table 5); by educational level from 87% to 89%; and by employment status from 88% to 90%. The SASSI-A3 had an 86% accuracy rate for adolescents who did not have a prior history of trouble with the law, and 90% for those who did. Accuracy rates by respondents' who reported not living with one or more of their parents was 90%.

Conclusion

These results indicate that the SASSI-A3 is a reliable and valid screening instrument and support its use as part of the clinical assessment process. The SASSI-A3 demonstrated good test-retest reliability and was found to correspond closely with clinical diagnoses of substance use disorders. Further, classifications on the SASSI-A3 were found to be accurate in diverse types of settings, and the influence of demographic classifications on the accuracy of the SASSI-A3 was found to be negligible.

References

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Table 1

Participant characteristics of SASSI-A3 development, cross-validation, and normative samples

Characteristic	Development (n = 257) %	Cross-validation (n = 258) %	Normative (n = 550) %
Data Source			
Criminal Justice Programs	2.33	4.65	
Social Services Programs	3.89	5.43	
Medical Pain Clinic	0	0	
Medical Facility/Non-Pain Clinic	0	0	
Substance Use Treatment	85.99	78.68	
Other	7.78	11.24	
Clinical Diagnosis	**=99.99**	**=100**	
Mild Substance Use Disorder	17.90	17.44	
Moderate Substance Use Disorder	17.51	11.63	
Severe Substance Use Disorder	31.91	37.60	
Criterion Negative	32.68	33.33	
Gender	**=100**	**=100**	
Male	68.87	62.02	50.91
Female	31.12	37.98	49.09
Missing	0	0	**0**
Employment Status	**=99.99**	**=100**	**=100**
Employed/Full-time	0.78	1.55	5.45
Employed/Part-time	11.67	13.95	20.91
Not employed	87.55	81.78	70.00
Volunteer	0	2.71	3.45
Missing	0	0	0.18
Race/Ethnicity	**=100**	**=99.99**	**=99.99**
Black or African American	15.95	18.60	9.45
American Indian or Alaska Native	0.39	1.55	1.45
Asian, Hawaiian or Pacific Islander	0.39	1.55	5.64
Hispanic	40.08	19.77	14.00
White or Caucasian	38.52	48.84	62.73
Multiracial	3.89	7.75	4.91
Other/Unknown	0.78	1.94	1.82
Living Situation	**=100**	**=100**	**=100**
Parents	66.93	53.88	98.18
Other Relatives	8.56	6.98	0.91
Friends	0.39	0.39	
Group Home	0.39	3.10	0
Residential	10.51	20.54	0
Other/Unknown	13.23	15.12	0.91
	=100.01	=100.01	=100
Trouble with the law			
Yes	97.28	96.90	3.27
No	2.72	3.10	96.55
Missing	0	0	0.18
Education (years)	**=100**	**=100**	**=100**
M	8.69	8.69	9.38
SD	1.58	1.58	1.71
Age (years)			
M	15.38	15.43	15.37
SD	1.47	1.37	

Table 2
Validation study estimates of SASSI-A3 test-retest stability and internal consistency

Scale	Stability Coefficient	Omega Coefficient
SASSI-A3 overall[a]	0.83	0.88
Face Valid Alcohol	0.61	0.93
Face Valid Other Drug	0.73	0.95
Friends-Family Risk	0.62	0.64
Attitudes	0.73	0.71
Symptoms	0.62	0.87
Obvious Attributes	0.75	0.70
Subtle Attributes	0.74	0.70
Defensiveness[b]	0.80	0.71
Supplemental Addiction Measure	0.74	0.71
Correctional[c]	0.68	0.81
Prescription Drug Abuse[bd]	0.35	0.83

Note. $N = 107$ for the stability sample; $N = 515$ for the internal consistency sample.

[a] Analysis includes only items utilized in the SASSI-A3 SUD screening outcomes. Tetrachoric correlation was used given the data were binary.
[b] Pearson correlation was used given the data were approximately normally distributed.
[c] Scale is not used to screen for substance use disorder.
[d] Scale is used to screen for prescription drug abuse.

Table 3
Correspondence between SASSI-A3 screening outcomes and DSM-5 SUD diagnoses in the overall SASSI-A3 validation study sample

	SASSI-A3 Screening Outcome		
	Test Positive	**Test Negative**	Total
Diagnosis			
Criterion Positive	311 (90%)	34 (10%)	345
Criterion Negative	25 (15%)	145 (85%)	170
Total	336	179	515

Note: 456/515 cases correctly classified = 88.54% Overall Accuracy, *Cramer's V* =0.75, *CI* (0.63, 0.86). Sensitivity = 90.14%; Specificity = 85.29%; Positive Predictive Value = 92.56%; Negative Predictive Value = 81.01%.

Table 4

SASSI-A3 screening accuracy as a function of respondent age category

	Age Category						
	13	**14**	**15**	**16**	**17**	**18**	
SASSI-A3 Screening Outcome							Total
Accurate	50 (82%)	80 (92%)	101 (91%)	107 (91%)	96 (83%)	22 (96%)	456 (89%)
Inaccurate	11 (18%)	7 (8%)	10 (9%)	10 (9%)	20 (17%)	1 (4%)	59 (11%)
Total	61	87	111	117	116	23	515

Note: Accurate classifications include both test positive and test negative cases that were consistent with clinical diagnoses regarding presence or absence of a substance use disorder. Inaccurate classifications are test positive and test negative cases that were inconsistent with clinical diagnoses, *Cramer's V* = 0.14, *CI* =(0, 0.23).

Table 5

SASSI-A3 screening accuracy as a function of ethnic group membership

	Black/ African American	**Hispanic American**	**White/ Caucasian**	**Multiracial**	**Other**	
SASSI-A3 Screening Outcome						Total
Accurate	79 (89%)	140 (91%)	196 (87%)	25 (83%)	16 (94%)	456 (83%)
Inaccurate	10 (11%)	14 (9%)	29 (13%)	5 (17%)	1 (6%)	59 (17%)
Total	89	154	225	30	17	515

Note: Accurate classifications include both test positive and test negative cases that were consistent with clinical diagnoses regarding presence or absence of a substance use disorder. Inaccurate classifications are test positive and test negative cases that were inconsistent with clinical diagnoses. Statistical analyses indicated no significant differences in SASSI-A3 screening accuracy as a function of respondent ethnic group membership, *Cramer's V* = 0.08, *CI (0, 0.14)*

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