Published in final edited form as:

Assessment. 2005 December ; 12(4): 384–394. doi:10.1177/1073191105279433.

Use of the Adolescent SASSI in a Juvenile Correctional Setting

L. A. R. Stein,

Brown University & Rhode Island Training School

Rebecca Lebeau-Craven,

Brown University

Rosemarie Martin,

Brown University

Suzanne M. Colby,

Brown University

Nancy P. Barnett,

Brown University

Charles Golembeske Jr., and

Rhode Island Training School & Brown University

Joseph V. Penn

Rhode Island Hospital

Abstract

The Substance Abuse Subtle Screening Inventory–Adolescent (SASSI-A) is used in evaluation and treatment planning for incarcerated juveniles. Validity of the SASSI-A in a juvenile correctional facility was examined using archival data. Findings generally support the validity of SASSI-A substance use scales. However, there is concern regarding the potential for ethnic bias in this setting. Cut-scores suggest that the SASSI-A may best be used for detecting problematic alcohol consumption using the Face Valid Alcohol Scale ≥ 3 . Future studies should more closely investigate whether the three underlying dimensions of the SASSI-A are useful in treatment planning. Results are presented in light of the relatively new SASSI-A2.

Keywords

adolescents; delinquents; substance abuse; ethnic/racial bias; incarceration

The Substance Abuse Subtle Screening Inventory (SASSI), SASSI-2, SASSI-3, Substance Abuse Subtle Screening Inventory–Adolescent (SASSI-A), and SASSI-A2 (Miller, 1985, 1990, 1994; Miller & Lazowski, 2001; Miller, Roberts, Brooks, & Lazowski, 1997) were designed to detect acknowledged as well as unacknowledged substance abuse. The adolescent SASSI may be useful in juvenile correctional settings where there is much need for accurate and efficient assessment of substance abuse. Such assessment allows for economic allocation of resources and identification of treatment needs. Scales exist that may be of use in detecting depression and suicide risk (e.g., the Defensiveness Scale [DEF]; see Bauman, Merta, & Steiner, 1999; U.S. Department of Health & Human Services, 1995) and in detecting recidivism (e.g., the Correctional Scale [COR]; see Myerholtz & Rosenberg, 1997). Detecting depression

and suicide risk, as well as potential recidivists, is relevant in juvenile forensic settings. Although the adolescent SASSI may be ideally suited for incarcerated juveniles, little independent research has been conducted to date on its use specifically in juvenile correctional settings.

Rogers and Kelly (1997) outlined several concerns regarding versions of the SASSI. They indicated that although the original validation of the SASSI offered promising results, the subscales of the SASSI and the decision rules for determining problematic substance use likely represent an overfitting of the data. Similarly, other researchers have found that adult versions of the SASSI have limited psychometric properties and ability to identify problematic substance use (see Clements, 2000; Myerholtz & Rosenberg, 1997; Svanum & McGrew, 1995; Teslak, 2000). On the other hand, Schwartz (1998), in collaboration with the SASSI Institute, found that the SASSI-2 effectively identifies substance abuse and prior criminal involvement. In addition, Lazowski, Miller, Boye, and Miller (1998) studied almost 2,000 participants and found sensitivity and specificity of .97 and .95, respectively.

The SASSI-A (Miller, 1990) was designed for use with adolescents. Original validation (Miller, 1990) indicated promising results in the correct classification of substance-dependent adolescents (83%); however, the test was somewhat less successful in correctly classifying adolescents without substance abuse (72%) or those denying substance abuse (69%). Whereas some researchers (see Piazza, 1996; Risberg, Stevens, & Graybill, 1995) have found promising results when the SASSI was used to classify adolescent substance abusers and nonabusers (overall correct classification rates as high as approximately 90%), other researchers have obtained less favorable results. Bauman et al. (1999) studied detection of substance abuse, depressive disorder, and conduct or oppositional defiant disorders using the SASSI-A with diagnoses determined by either a licensed psychologist or psychiatrist. Results indicate poor agreement between substance disorder diagnosis and SASSI-A classification for substance abuse. Similarly, relevant SASSI-A scales (DEF, COR) were not related to depressive disorder or oppositional defiant or conduct disorders.

Rogers, Cashel, Johansen, Sewell, and Gonzalez (1997) studied classification rates based on SASSI-A scores in a sample of dually diagnosed adolescent offenders in residential treatment. The SASSI-A was highly accurate in detecting substance abusers who openly admitted to substance use problems. About 76% of teens minimizing use were also identified, but more than two thirds of nonusers were misclassified as substance abusers. In addition, findings suggested that the SASSI-A may not generalize to Hispanic youth in that the SASSI-A may underdetect substance problems in this population. This is a serious limitation for use with juvenile forensic populations given the ethnic diversity found in these settings.

The SASSI-A2 (Miller & Lazowski, 2001) was developed in an effort to enhance accuracy and utility of the instrument. The SASSI-A2 manual presents positive predictive power (.98), negative predictive power (.75), sensitivity (.95), and specificity (.89) with an overall correct classification rate of about 94%. The SASSI-A2 was released in 2001; however, as yet, there are no peer-reviewed publications on the performance of this instrument. The purpose and overall structure of the SASSI-A2 are unchanged from the earlier version and are comparable to the three adult versions (Miller & Lazowski, 2001). A number of new scales have been added; however, scales original to the SASSI-A have been retained (Face Valid Alcohol [FVA], Face Valid Other Drug [FVOD], Obvious Attribute [OAT], Subtle Attribute [SAT], DEF, COR; see Methods section for more information). In prior improvements of the test, continuity has been maintained between older and newer versions to facilitate research comparisons among versions and to allow continued use of accumulated clinical information (Lazowski et al., 1998). In comparing the SASSI-A and SASSI-A2, there have been no changes to FVA, FVOD retained all original items and 2 more have been added for a total of 16 items on the

SASSI-A2, OAT retained 11 items of the original 20 and is now composed of only 11 items, SAT retained 6 of the original 10 items and is now composed of 12 items, and COR retained 5 of the original 16 items and now has 11 new items added to it for a total of 16 items on the new version.

Clearly, results have been mixed with respect to the accuracy and usefulness of various versions of the SASSI in detecting substance abuse and other clinical phenomena, perhaps in part because of differences in the dependent variables (DVs) used. In addition, although the adolescent SASSI is used in juvenile correctional settings for evaluation and treatment planning, research on the use of this instrument in such settings is sorely lacking. Such research is particularly germane, because many of the items appear to have an antisocial content. Given the co-occurrence of antisocial behavior and substance abuse, using antisocial tendencies to identify substance abuse will likely be ineffective in correctional settings. In this case, nonabusing offenders may be classified as abusing substances (see Rogers & Kelly, 1997; Stein & Graham, 2001).

The purpose of the present study was to examine the use of the SASSI-A in a juvenile correctional facility. Specifically, using archival data, we first examined the association of various relevant SASSI-A scales to problematic substance use levels, suicidal ideation or behavior, and crimes. Second, we determined whether scales of the SASSI-A evidence ethnic or age-related bias. The SASSI-A manual indicates that items are unrelated to age, so different age norms are not necessary (Miller, 1990). To date, no independent research has been conducted to examine age-related bias and very little has been done to examine ethnic bias. Third, we examined the utility of the SASSI-A scales and decision rules to correctly classify substance misuse (in terms of frequency of use), and we offer classification rates. Finally, as pointed out by Rogers et al. (1997), Miller (1990) neglected to explore underlying dimensions of the SASSI-A. Therefore, we performed principal components analyses (PCA) on the SASSI-A items and compare our results with the findings of Rogers et al. (1997).

Although the SASSI-A2 has been released, research on the SASSI-A is important. First, findings on earlier versions will inform research and clinical use of later versions, because the developers of the SASSI tests attempt to maintain continuity between versions (Lazowski et al., 1998; Miller & Lazowski, 2001). Second, until there are peer-reviewed, empirical publications of the SASSI-A2, many clinicians will continue to rely on information regarding the SASSI-A.

METHOD

Participants

The initial sample consisted of 202 adolescents adjudicated during a 3-year period (1997 to 2000) to a juvenile correctional facility in the Northeast for criminal charges ranging from drug possession to assault. All were evaluated as part of the facility's substance abuse treatment program. Results were used as part of an assessment to triage adolescents to various intensity levels of substance abuse treatment. Treatment ranged from none to psycho-educational (classroom style) to more in-depth and intensive individual and group treatment (discussing triggers and coping).

Adolescents were eliminated from the initial sample of 202 on the basis of Random Answering Pattern (RAP) or DEF (see the Measures section for definitions) *T*-scores > 70, as recommended in the SASSI-A manual (Miller, 1990). Twenty-four adolescents were eliminated based on the above criteria to leave a final sample of *N* = 178. The average age in the final sample was 17 years (*SD* = 1.9), and 92.1% were boys. Fourteen adolescents did not

report an ethnic group; however, of the remaining 164 adolescents, 39.6% ($n = 65$) were Hispanic, 19.5% ($n = 32$) were Black, and 40.9% ($n = 67$) were White.

Measures

SASSI-A—The SASSI-A contains 26 items regarding alcohol and drug use that adolescents rate on a 4-point Likert-type scale (0 = *never* to 3 = *repeatedly*). Additionally, it contains 55 true/false items on substance use and other behaviors. Scores in the manual are reported in terms of *T*-scores as well as raw scores (Miller, 1990), and there are separate norms for girls and boys. Validity data are presented above; the manual lacks detailed data regarding internal consistency and test-retest reliabilities for each of the seven scales (Miller, 1990). The SASSI-A2 manual (Miller & Lazowski, 2001) presents internal consistency coefficients ranging from .61 to .95 and test-retest reliability coefficients ranging from .71 to .92.

FVA, FVOD, OAT, SAT, DEF, Defensive Abuser (DEF2), RAP, and COR were scored. FVA and FVOD are scales used to detect persons freely admitting to substance abuse. OAT is used to detect persons acknowledging psychological distress due to substance abuse. SAT is used to detect persons attempting to conceal a pattern of living that is related to substance abuse. DEF is used to detect persons responding defensively to the test, whereas DEF2 is used to detect substance abusers who respond defensively to the test. It has been suggested that DEF also measures suicide and depression (see Bauman, Merta, & Steiner, 1999; U.S. Department of Health & Human Services, 1995). RAP measures random responding, and COR (a relatively newer scale) measures disruptive behavior.

To determine whether a respondent abuses substances or qualifies as chemically dependent (hereafter, ChemDep), the manual (Miller, 1990) outlines a series of decision rules involving the above scales. These rules produce a yes/no category indicating substance abuse status. FVOD, FVA, OAT, and SAT can be used separately to detect substance abuse or can be used in combination with other scales to determine substance abuse status.

Structured Clinical Information Recording Form (SCIRF)—This form assisted in structuring the clinical interview conducted by the licensed chemical dependency counselors (LCDCs) and was the form on which adolescent responses were recorded. Although no psychometric data are available on the SCIRF, it is the standard form used during substance use evaluations at the facility. Interview topics included history of suicidal ideation and behavior, history of charges, ethnic background, and frequency of alcohol and drug abuse. LCDCs had about 7 years of clinical experience, and LCDCs of both genders conducted interviews. LCDCs did not have access to the SASSI-A data for the interview; however, they did have access to other collateral data to guide the interview process. Adolescents knew that their responses to the interview could be checked with records, observational data, and collateral reports.

On the SCIRF, categories of alcohol and drug use were as follows: do not use, use less than monthly, use once per month, use 2 to 3 times per month, use 1 to 2 times per week, use 3 to 6 times per week, use daily, and use more than once per day. Frequency of use was asked separately for alcohol and for a variety of substances (including cocaine, marijuana, LSD, etc.). By far, the most commonly used substances were alcohol and marijuana (Lebeau-Craven et al., 2003).

Procedures

Consent—Adolescents and their guardians provided consent to the evaluation as part of routine treatment of adjudicated adolescents. They were informed that facility staff and legal

authorities could have access to the results of testing and the interview. All participant data were treated in accordance with Brown University's Internal Review Board guidelines.

Testing and interview—Testing was conducted individually with each adolescent. Adolescents read the SASSI-A to themselves and completed the written version of the test. Occasionally, adolescents had the SASSI-A read to them by the LCDC and responded in private on an answer sheet (this could occur if a teen had reading difficulty). The interview was conducted covering the areas on the SCIRF as described above. The SASSI-A was generally administered before the SCIRF. The time between testing and the interview was not regularly recorded but generally varied by a matter of hours.

Development of substance, crime, and suicide variables—Substance use variables were collapsed so that data would meet distributional assumptions for analyses. For alcohol use (and separately for each drug), frequency of use was collapsed into 0 = no use, 1 = use once per month or less, 2 = use more than once per month but no more than twice per week, and 3 = use several days per week or more. General drug use, excluding alcohol, was collapsed into the following: 0 = no use of any drug, 1 = use once per month or less for every drug, 2 = use of any drug more than once per month but no more than twice per week and no drug used at a rate of several days per week or more, and 3 = use of any drug several days per week or more. A combined drug-alcohol use variable was created as well: 0 = no use of substances (including alcohol), 1 = use once per month or less for every substance (including alcohol), 2 = use of any substance (including alcohol) more than once per month but no more than twice per week and no substance (including alcohol) used at a rate of several days per week or more, and 3 = use of any substance (including alcohol) several days per week or more. A continuous crime variable was created from SCIRF data by calculating the total number of lifetime charges reported by the teen (see Table 1). Finally, the suicide variable was coded into 1 = history of suicidal ideation or attempt and 0 = no history of suicidal ideation or attempt.

RESULTS

Basic Descriptive Data on Dependent (DVs) and Independent Variables (IVs)

Table 1 presents basic descriptives on the SASSI-A scales (IVs), substance misuse variables, and the crime indicator (DVs). In addition, for our suicide indicator (DV), 24.2% of adolescents had previously attempted or seriously considered suicide at some point in the past (total $N = 178$). Using the decision rules as described above, ChemDep (IV) is 45.5% (out of $N = 178$). Because of missing values on the SASSI-A and SCIRF, some variables have an $n < 178$.

Relationships Among IVs and DVs

Table 2 shows the generally significant correlations between each SASSI-A scale and relevant variables. Correlations between the combined drug-alcohol frequency indicator and relevant SASSI-A scales were nonsignificant, and the correlation between COR and the continuous crime DV was nonsignificant; therefore, these results are not presented. The point-biserial correlation between the suicide DV and DEF was significant ($r = -.36, p < .0001$). Assuming a medium effect size, power was adequate for analyses (Cohen, 1988).

Examining Bias Among SASSI-A Indicators

If the SASSI-A scales are ethnically (or age) biased, then ethnicity (or age) will moderate the ability of the SASSI-A scales to predict substance abuse. To find a moderator effect, first a significant relationship is demonstrated between the IV and the DV, then a significant relationship is demonstrated between the moderator and the DV (Cohen & Cohen, 1983). If both of the above conditions are true, then the interaction between the IV and the moderator is examined. If the interaction is significant, then there is a moderator effect (Cohen & Cohen,

1983). If any of these three conditions are not found, then there is no evidence of a moderator effect. Power was adequate to detect a medium effect size (Cohen, 1988).

Analyses involving ethnic bias in the prediction of substance use—As shown in Table 2, significant relations generally exist between the relevant SASSI-A IVs and substance use DVs. Table 2 shows the point-biserial correlations between each ethnic grouping (moderator variable) and each substance indicator (DV). As can be seen in Table 2, these associations are significant and generally maintain significance even after the Bonferroni correction (Howell, 1992) is applied. Using a hierarchical regression model with substance use level (alcohol or drug use) as the DV and Whites coded as the referent group (Pagano & Gauvreau, 2000) in the analyses, we entered the relevant SASSI-A scale (e.g., FVOD or OAT) and an ethnic grouping (e.g., Hispanic or Black) on Step 1, and on Step 2, the interaction term (Scale $\times$ Ethnicity) was entered (e.g., FVOD $\times$ Hispanic). To test biased prediction of drug use for Hispanics as compared to Whites, four regressions were run (FVOD, OAT, SAT, DEF2). Likewise, to test biased prediction of alcohol use for Hispanics as compared to Whites, four regressions were run (FVA, OAT, SAT, DEF2). Similar analyses were conducted to test ethnic bias for Blacks.

After implementing the Bonferroni correction ($\alpha/4 = .013$ for each set of regressions), only one scale evidenced ethnic bias. In the prediction of alcohol use, evidence was found that Hispanic ethnicity moderated the performance of OAT. Of note, two more relationships were nonsignificant only after implementing the conservative Bonferroni correction. These include SAT predicting alcohol use for Hispanics and OAT predicting alcohol use for Blacks. Results are displayed in Table 3.

Because ChemDep is a yes/no IV and ethnicity is also categorical, to test for ethnic bias on ChemDep, a 2×3 ANOVA was run first for alcohol as the DV and then for drug use as the DV. The interaction term (ChemDep $\times$ Ethnicity) for alcohol was significant, $F(2, 158) = 3.80$, $p < .025$, whereas for drug use it was nonsignificant. Follow-up analyses indicate that ChemDep predicted alcohol use level for Hispanics, $F(91, 158) = 10.69$, $p < .001$, but not for Blacks, $F(1, 158) = 4.41$, $p < .05$, or for Whites, $F(1, 158) = .09$, $p > .05$, after implementing the Bonferroni correction ($\alpha/3 = .017$ for three levels of race).

Analyses involving ethnic bias in the prediction of suicide—As indicated above, the suicide DV was significantly related to DEF (IV). Separate analyses indicated significant relationships between the dichotomous suicide indicator and ethnicity, $\chi^2 = 11.30$ ($df = 2$, $n = 164$), $p < .005$. Using a logistic regression model, with history of suicidal ideation or behavior (yes or no) as the DV and Whites coded as the referent group (Pagano & Gauvreau, 2000) in the analyses, we entered DEF and an ethnic grouping (e.g., Hispanic or Black) on step 1. On step 2, the interaction term (DEF $\times$ Ethnicity) was entered (e.g., DEF $\times$ Hispanic). To test biased prediction of suicide for Hispanics as compared to Whites, one regression was run. Likewise, to test biased prediction of suicide for Blacks as compared to Whites, another regression was run. None of the interaction terms was significant; however, for both ethnic groups, DEF was significantly related to suicide (see Table 4).

Analyses involving ethnic bias in the prediction of crime—Table 2 shows the point-biserial correlations between each ethnic grouping (moderator variable) and the continuous crime DV. Although these associations were generally significant, ethnic bias in relation to the continuous crime indicator will not be examined because, as indicated above, COR is not significantly associated with this DV.

Analyses involving age-related bias—All associations between age (moderator) and each DV were found to be nonsignificant; therefore, age will not be considered in other analyses to examine potential bias.

Development of Cut-Scores

For those scales that were significantly related to their respective DVs, we next developed cut-scores and classification rates as shown in Table 5 for each individual scale. Separately for alcohol and drugs, use once per month or less was classified as nonproblematic, whereas use at levels reaching multiple times per month or more was considered problematic use. These classifications were made based on the relatively low rates of monthly alcohol and drug use found in the National Household Survey on Drug Abuse (Substance Abuse & Mental Health Services Association, 2002) for similarly aged teens during 1999.

As can be seen in Table 5, the best classification rates for detecting problematic alcohol use (base rate [BR] = 70%) were found at an FVA raw score ≥ 3 , an OAT T -score ≥ 50 , a SAT T -score ≥ 60 , and a DEF2 raw score ≥ 8 (raw and T -scores used according to manual suggestions; Miller, 1990). These cut-scores classified between 61% and 78% of adolescents correctly overall. The best classification rates for detecting problematic drug use (BR = 62%) were found at an FVOD ≥ 8 , an OAT ≥ 50 , a SAT ≥ 60 , and a DEF2 ≥ 8 . These cut-scores classified between 54% and 59% of adolescents correctly overall. ChemDep = 1 (yes) correctly classified 62% overall with respect to problematic alcohol use, and with respect to problematic drug use, it correctly classified 58% overall. Although parametric analyses indicated that DEF is related to suicidal ideation/attempts, cut-scores are not presented because DEF was not developed to detect suicidal ideation/attempts.

Principal Components Analysis (PCA) of SASSI-A Items

Finally, a PCA was conducted on the 55 true/false SASSI-A items. Similar to Rogers and Kelly (1997), we found a three-factor to four-factor solution using the Kaiser rule and scree plot. However, in determining the number of components to retain, the Kaiser rule is problematic and the scree plot should only be used as an adjunct (Velicer, Eaton, & Fava, 2000). We therefore conducted a PCA using the superior minimum average partial (MAP) correlation procedure and the scree plot to determine the number of components to retain (see Velicer, LaForge, Levesque, & Fava, 1994). This technique yielded a three-factor solution (all items loaded at $\geq .40$) with varimax rotation accounting for 24.32% of the variance: $F_1 = 10.00\%$ of the variance, named Negative Outlook/Depressive; $F_2 = 8.43\%$, Behavior Problems/Substance Abuse; and $F_3 = 5.90\%$, Conformity/Socialized. These factors are very similar to the first three factors that Rogers and Kelly found. We forced a four-factor solution and did not obtain a fourth scale matching the fourth scale found by Rogers and Kelly. These analyses were adequately powered given an average loading of .51 per factor, about 10 items per factor, a sample size of 178, and replication of Rogers and Kelly's results (see Guadagnoli & Velicer, 1988).

DISCUSSION

Generally, means and standard deviations of SASSI-A scales in this sample are comparable to those reported in the SASSI-A manual (Miller, 1990) for juveniles in correctional settings (see Table 1). The SASSI-A2 manual (Miller & Lazowski, 2001) does not provide means and standard deviations on correctional adolescents. However, the FVOD in this study produced a substantially greater mean and standard deviation than are reported in the SASSI-A manual (Miller, 1990). This may be because of sampling differences between both studies, as teens in the current study were assessed as part of a substance abuse evaluation. Unfortunately, little data are available in the SASSI-A manual (Miller, 1990) on the normative sample of

incarcerated juveniles to evaluate this possibility. Forty-six percent of adolescents qualified for substance use disorder (via ChemDep) in the current sample, whereas for incarcerated juveniles as presented in the manual, this figure is 48% (Miller, 1990).

The SASSI-A scales correlated as expected with relevant variables, thereby supporting the construct validity of the SASSI-A in this setting (see Table 2). Oddly, no correlations are offered in the manual between SASSI-A scales and relevant measures (see Miller, 1990). Rogers and Kelly (1997) also found that the SASSI-A scales were significantly correlated with their derived Substance Impairment Index. Although correlations presented in Table 2 for the substance scales are significant, they are in the small to medium effect size range (Cohen, 1988). We note that this may be because the DV used in this study reflected frequency of use, whereas the SASSI scales are used to detect use disorders. On the other hand, even in studies using more comprehensive DVs reflecting substance problems, SASSI correlations are in the medium effect size range (see Myerholtz & Rosenberg, 1997). The COR was not related to our continuous measure of crime. This is striking because our continuous crime measure is a proxy for disruptive behavior and recidivism, and the COR is purportedly a measure of acting out (Miller, 1990) and recidivism (Myerholtz & Rosenberg, 1997; Schwartz, 1998). At this time, the SASSI-A COR appears to be of limited value as a measure of recidivism. However, it is important to note that COR has undergone substantial revision on the SASSI-A2, and its usefulness may be much improved, although this awaits empirical investigation. DEF appears to be a valid indicator of suicidal ideation or behavior.

We found no indication of age-related bias, and we found evidence that the SASSI-A operates differently for Whites as compared to Hispanics. Analyses indicated that at lower levels of OAT, predicted alcohol use is lower for Hispanics than for Whites, whereas at higher levels of OAT, prediction of alcohol use is higher for Hispanics as compared to Whites. OAT appears relatively unrelated to alcohol use for Whites in this setting. Similarly, analyses indicated that ChemDep is a better predictor of alcohol use for Hispanics than for Blacks or Whites. Rogers and Kelly (1997) also found that Whites and Hispanics differed significantly in the extent to which their SASSI-A elevations reflected substance involvement. DEF evidenced no ethnic bias in prediction of suicidal ideation or behavior, and similarly, COR did not evidence ethnic bias in its relationship to crimes committed. Results in this report indicate that the OAT and ChemDep scales of the SASSI-A may yield differential results in this setting based on ethnicity. However, we note that had we had a more comprehensive DV that measured chemical dependence; ChemDep may have been related to this DV for all three ethnic groups (rather than only being related for Hispanics).

We know of no other empirical reports studying cut-scores on the SASSI-A. Cut-scores obtained were similar for alcohol and drugs; however, classification rates for problematic drug use were lower than those for alcohol (Table 5). Optimal cut-scores in this report were generally lower than those suggested in the adolescent SASSI manuals (Miller, 1990; Miller & Lazowski, 2001). Rates for detecting substance abuse as presented in the SASSI-A manual range from 22% to 83%, and generally, our rates for detecting problematic substance use are higher (Miller, 1990). These differences in cut-scores and classification rates could be a result of differences in sampling and BRs of problematic substance use found between the two samples. However, once again, this possibility is difficult to evaluate because BRs and sample descriptions are not clearly presented in the manual (Miller, 1990).

Classification rates using ChemDep were less than adequate given the BRs of alcohol (~ 70%) and drugs (~ 62%) in the sample. This is noteworthy, given that ChemDep should provide to clinicians the ultimate indicator according to SASSI-A decision rules (Miller, 1990). As noted above, this may be because our DV measured only substance use level as compared to other elements of chemical dependence (such as problems related to use).

Classification rates presented in the SASSI-A2 manual for adolescent offenders are generally higher (specificity = .85, sensitivity = .95, positive predictive power = .97, negative predictive power = .72; BR = .86) than those presented in this report (alcohol: specificity = .63, sensitivity = .84, positive predictive power = .84, negative predictive power = .63, BR = .70; drugs: specificity = .52, sensitivity = .63, positive predictive power = .68, negative predictive power = .47, BR = .62). This may be because of differences between the two samples in the substance variable: The SASSI-A2 used the 4th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1994), whereas this report used frequency of substance use based on National Household Survey on Drug Abuse data (Substance Abuse & Mental Health Services Association, 2002). Differences between the current results and the SASSI-A2 manual may also reflect differences in the BRs of substance abuse between the two samples. It should be noted that the BRs presented in this report and in the SASSI-A2 manual are consistent with reported BRs in other juvenile correctional facilities, which range from about 53% to 87% (Stein et al., 2004; Stein & Graham, 2004).

Results of PCA indicated that the SASSI-A is composed of three components: Negative Outlook/Depressive, Behavior Problems/Substance Abuse, and Conformity/Socialized. These replicate the first three factors found by Rogers and Kelly (1997). Unlike Rogers and Kelly, we did not find evidence for a fourth factor. This may be because using the MAP procedure to determine the number of factors yields more accurate results (see Velicer et al., 1994) than traditional techniques. Although the three dimensions do not account for a substantial amount of the variance, the 24.3% of variance accounted for is similar to previous findings (Rogers & Kelly, 1997). These results, now produced by two independent studies involving incarcerated juveniles, indicate that the SASSI-A consists of three dimensions. Future studies may show that these dimensions have utility for assessing domains important to treating incarcerated adolescents. Future studies may also conduct PCA on the SASSI-A2 to determine if factors have been maintained during revision.

Results should be confirmed in other types of samples (e.g., adolescent inpatients), and future studies should obtain larger sample sizes for the purposes of cross-validation using the SASSI-A2. Although BRs found in this study are similar to those found in other juvenile correctional facilities (see Stein et al., 2004; Stein & Graham, 2004), further research is needed using samples with a variety of substance use BRs. Future studies should access larger samples of girls allowing for analyses by gender. Both interrater reliability and temporal stability data for our interview variables were unavailable. However, it is important to note that the SCIRF was not introduced to this setting for the purposes of this study. On the contrary, this instrument was an integral part of screening procedures for these adolescents. In this context, it would have been impractical for us to ask that the SCIRF be administered to a subsample of adolescents on two occasions by counselors. Also, this study is based on self-report data at two time points (interview informed by available records and paper-pencil testing). Future studies may collect collateral data from family members and biological samples. However, we do note that substance reports are generally accurate (Babor, Webb, Burleson, & Kaminer, 2002) and that adolescents usually report more substance use than is reported by collaterals and in comparison with biological tests (Dennis et al., 2002).

Another limitation of this study is that diagnostic data were unavailable for alcohol and drug use diagnoses. However, the SCIRF provided relatively continuous data for many analyses, and analyses were therefore more statistically powerful than if we had used diagnostic categories (Tabachnick & Fidell, 1996). Also, diagnostic data are often based on adult models, which may not apply to adolescents (Winters, 1990). On the other hand, the SCIRF was a structured interview conducted by well-trained and experienced LCDCs accustomed to assessing incarcerated juveniles. We therefore believe that our interview variables were adequate for the purposes of this study, although we recommend additional use of a diagnostic

interview in future studies. Although our interview variables were imperfect (specifically the substance variables), diagnostic data were unavailable, and we believe that the current study still expands the knowledge base regarding use of the SASSI-A for incarcerated juveniles.

Generally, our findings support the validity of the SASSI-A scales. However, there is serious concern regarding the potential for ethnic bias of the SASSI-A in this setting. Cut-scores suggest that the SASSI-A may be best used for detecting alcohol use problems using an FVA ≥ 3 . Future studies may more closely investigate the utility of the three factors that comprise the SASSI-A.

The SASSI-A2 utilized a more diverse ethnic sample, larger sample size, and altered item pool during revision. These factors may have improved the adolescent SASSI; however, this awaits independent empirical investigation. Results presented here are consistent with those of the improved adult version (SASSI-3). FVA scale produced the best classification rates using a much lower cut-score than presented in the manual (Miller & Lazowski, 2001). It is important to note that FVA was not revised from the SASSI-A to the SASSI-A2. Given the findings presented here, the SASSI-A is best used by clinicians to detect problematic alcohol use levels with an FVA ≥ 3 . The SASSI-A does not appear as useful to clinicians in detecting drug use and misbehaviors. To date, there are no peer-reviewed publications of the SASSI-A2. Because of continuity between versions of the SASSI during revision (Lazowski et al., 1998; Miller & Lazowski, 2001), results of the current study inform future investigation and current use of the SASSI-A2 by researchers and practicing clinicians.

Acknowledgments

This work was supported in part by a grant from the Center for Alcohol and Addiction Studies, Brown University (principal investigator, Lebeau-Craven) and in part by a grant from the National Institute on Drug Abuse (R01 #13375; principal investigator, Stein).

References

- American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4. Washington, DC: Author; 1994.
- Babor TF, Webb C, Burleson JA, Kaminer Y. Subtypes for classifying adolescents with marijuana use disorders: Construct validity and clinical implications. *Addiction* 2002;97:58–69. [PubMed: 12460129]
- Bauman S, Merta R, Steiner R. Further validation of the adolescent form of the SASSI. *Journal of Child & Adolescent Substance* 1999;9:51–71.
- Clements R. Psychometric properties of the Substance Abuse Subtle Screening Inventory–3. *Journal of Substance Abuse Treatment* 2000;23:419–423. [PubMed: 12495805]
- Cohen, J. Statistical power analysis for the behavioral sciences. 2. Hillsdale, NJ: Lawrence Erlbaum; 1988.
- Cohen, J.; Cohen, P. Applied multiple regression/correlation analysis for the behavioral sciences. 2. Hillsdale, NJ: Lawrence Erlbaum; 1983.
- Dennis M, Titus JC, Diamond G, Donaldson J, Godley SH, Tims FM, et al. The Cannabis Youth Treatment (CYT) experiment: Rationale, study design and analysis plans. *Addiction* 2002;97(Suppl 1):16–34. [PubMed: 12460126]
- Guadagnoli E, Velicer WF. Relation of sample size to the stability of component patterns. *Psychological Bulletin* 1988;103:265–275. [PubMed: 3363047]
- Howell, D. Statistical methods for psychology. 3. Boston: PWS-Kent; 1992.
- Lazowski LE, Miller FG, Boye MW, Miller GA. Efficacy of the Substance Abuse Subtle Screening Inventory–3 (SASSI-3) in identifying substance dependence disorders in clinical settings. *Journal of Personality Assessment* 1998;7:114–128. [PubMed: 9807231]

- Lebeau-Craven R, Stein LAR, Barnett N, Colby S, Smith J, Canto A. Prevalence of alcohol and drug use among youth in a Rhode Island training facility. *Substance Use & Misuse* 2003;38:825–834. [PubMed: 12801144]
- Miller, GA. The Substance Abuse Subtle Screening Inventory–Revised (SASSI-R) manual. Bloomington, IN: SASSI Institute; 1985.
- Miller, GA. The SASSI—Adolescent manual. Bloomington, IN: SASSI Institute; 1990.
- Miller, GA. The Substance Abuse Subtle Screening Inventory (SASSI) manual. Bloomington, IN: SASSI Institute; 1994.
- Miller, GA.; Lazowski, LE. Adolescent SASSI-A2 manual. Springville, IN: SASSI Institute; 2001.
- Miller, GA.; Roberts, J.; Brooks, MK.; Lazowski, LE. SASSI-3 user's guide. Bloomington, IN: Baugh Enterprises; 1997.
- Myerholtz L, Rosenberg H. Screening DUI offenders for alcohol problems: Psychometric assessment of the Substance Abuse Subtle Screening Inventory. *Psychology of Addictive Behaviors* 1997;11:155–165.
- Pagano, M.; Gauvreau, K. Principles of biostatistics. 2. Pacific Grove, CA: Duxbury; 2000.
- Piazza NJ. Dual diagnosis and adolescent psychiatric inpatients. *Substance Use & Misuse* 1996;31:215–223. [PubMed: 8834009]
- Risberg RA, Stevens MJ, Graybill DF. Validating the adolescent form of the Substance Abuse Subtle Screening Inventory. *Journal of Child & Adolescent Substance Abuse* 1995;40:25–41.
- Rogers R, Cashel ML, Johansen J, Sewell KW, Gonzalez C. Evaluation of adolescent offenders with substance abuse: Validation of the SASSI with conduct-disordered youth. *Criminal Justice & Behavior* 1997;24:114–128.
- Rogers, R.; Kelly, KS. Denial and misreporting of substance abuse. In: Rogers, R., editor. *Clinical assessment of malingering and deception*. New York: Guilford; 1997. p. 107-129.
- Schwartz JA. Adapting and using the Substance Abuse Subtle Screening Inventory—2 with criminal justice offenders: Preliminary results. *Criminal Justice & Behavior* 1998;25:344–365.
- Stein, LAR.; Colby, S.; Barnett, N.; Monti, P.; Lebeau-Craven, R.; Golembeske, C. Preliminary findings of a randomized clinical trial in a juvenile correctional setting. Paper presented at a meeting of the National Institute on Drug Abuse; Rockville, MD. 2004 Dec.
- Stein LAR, Graham JR. Use of the MMPI-A to detect substance abuse in a juvenile correctional setting. *Journal of Personality Assessment* 2001;77:508–523. [PubMed: 11781036]
- Stein LAR, Graham JR. Ability of substance abusers to escape detection on the MMPI-A in a juvenile correctional facility. *Assessment* 2004;12:28–39. [PubMed: 15695741]
- Substance Abuse & Mental Health Services Administration. Summary of findings from the 2001 National Household Survey on Drug Abuse: Volume II. Technical appendices and selected data tables (NHSDA series H-18, Pub. #SMA 02-3759). Rockville, MD: U.S. Department of Health & Human Services, Office of Applied Studies; 2002.
- Svanum S, McGrew J. Prospective screening of substance dependence: The advantages of directness. *Addictive Behaviors* 1995;20:205–213. [PubMed: 7484314]
- Tabachnick, BG.; Fidell, LS. Using multivariate statistics. 3. New York: HarperCollins; 1996.
- Teslak AG. The utility of the CAGE, MAST, DAST, and SASSI-3 in assessing substance use/misuse in a psychiatric population. *Dissertation Abstracts International* 2000;61:2814B.
- U.S. Department of Health & Human Services. Combining alcohol and other drug abuse treatment with diversion for juveniles in the justice system (Treatment Improvement Protocol series #21, Pub. #SMA 95-3051). Rockville, MD: Author; 1995.
- Velicer, WF.; Eaton, CA.; Fava, JL. Construct explication through factor or component analysis: A review and evaluation of alternative procedures for determining the number of factors or components. In: Goffin, RD.; Helmes, E., editors. *Problems and solutions in human assessment: Honoring Douglas N. Jackson at seventy*. Boston: Kluwer; 2000. p. 41-71.
- Velicer WF, LaForge RG, Levesque DA, Fava JL. Development and initial validity of smoking policy invention. *Tobacco Control* 1994;3:347–355.
- Winters K. The need for improved assessment of adolescent substance involvement. *Journal of Drug Issues* 1990;20:487–502.

Biographies

L. A. R. Stein, Ph.D., is an assistant professor (research) in the Department of Psychiatry and Human Behavior, Brown University, and a faculty member at the Center for Alcohol and Addiction Studies. She is also director of the Forensic Psychology Post-Doctoral Training Program at Brown University and director of research at the Rhode Island Training School. Her interests are in assessment and treatment of substance-using persons involved in the justice system.

Rebecca Lebeau-Craven, M.P.H., is a doctoral student at the University of Rhode Island and is a project coordinator at the Center for Alcohol and Addiction Studies, Brown University. She is interested in assessment issues as they relate to substance-using adolescents.

Rosemarie Martin, Ph.D., is an assistant professor (research) at the Center for Alcohol and Addiction Studies, and she is a faculty member in the Department of Community Health, Brown University. Her interests are in quantitative psychology, especially as applied to substance use research.

Suzanne M. Colby, Ph.D., is an associate professor (research) in the Department of Psychiatry and Human Behavior, Brown University, and a faculty member at the Center for Alcohol and Addiction Studies. Her areas of interest include adolescent and young adult substance use assessment and treatment with an emphasis on nicotine, alcohol, and marijuana.

Nancy P. Barnett, Ph.D., is an assistant professor (research) in the Department of Psychiatry and Human Behavior, Brown University, and a faculty member at the Center for Alcohol and Addiction Studies. Her areas of interest include adolescent and young adult assessment and treatment of alcohol use and abuse with an emphasis on college student drinking.

Charles Golembeske, Jr., Ph.D., has a clinical faculty appointment in the Department of Psychiatry and Human Behavior at Brown University through the Center for Alcohol and Addiction Studies. He is the clinical director of the Juvenile Forensic Psychology Post-Doctoral Training Program at Brown University and is also clinical director of the Rhode Island Training School.

Joseph V. Penn, M.D., is a clinical faculty member at Rhode Island Hospital and is in the Department of Psychiatry and Human Behavior at Brown University. He is the director of Child and Adolescent Psychiatry at the Rhode Island Training School. His areas of interest include adolescent suicide assessment and psychopharmacological treatments for adolescents.

TABLE 1

Means and Standard Deviations of Substance Abuse Subtle Screening Inventory—Adolescent Scales and Dependent Variables

<i>Variable</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Scales ^a			
FVA	171	7.46	6.96
OAT	170	11.18	4.12
SAT	170	4.22	2.45
FVOD	171	11.85	9.50
DEF	170	6.21	2.94
DEF2	170	5.38	2.32
COR	170	8.87	2.08
Dependent variables			
Alcohol	178	1.73	1.00
Drugs	178	1.83	0.86
Alcohol & drugs	178	2.26	0.79
Number of charges ^b	168	1.48	0.77

NOTE: FVA = Face Valid Alcohol; OAT = Obvious Attribute; SAT = Subtle Attribute; FVOD = Face Valid Other Drug; DEF = Defensive; DEF2 = Defensive Dependent versus Defensive Nondependent; COR = Correctional.

^aRaw scores provided as indicated in manual (Miller, 1990).

^bThe range of charges is from 1 to 5.

TABLE 2

Correlations Between Substance Abuse Subtle Screening Inventory—Adolescent and Dependent Variables and Between Moderator Variables and Dependent Variables

Independent Variable	Alcohol	Drugs	Number of Charges
Scale			
FVA	.27****		
OAT	.16*	.19**	
SAT	.25****	.20**	
FVOD		.21**	
DEF2	.15*	.19**	
ChemDep ^a	.27****	.20**	
Moderators ^a			
White	.28****	.21**	.18*
Black	-.13* ^b	-.27****	-.01
Hispanic	-.17*	.00	-.17*

NOTE: FVA = Face Valid Alcohol; OAT = Obvious Attribute; SAT = Subtle Attribute; FVOD = Face Valid Other Drug; DEF2 = Defensive Dependent versus Defensive Nondependent; ChemDep = Chemically Dependent.

^aNumbers associated with these variables are point-biserial correlations. All other numbers are Pearson product moment correlations.

^bAfter using the Bonferroni correction, the relation was no longer significant. The correction is $\alpha/3$ for three substance categories (nonsignificant drug-alcohol category not shown).

*
 $p \leq .05$.

**
 $p \leq .01$.

 $p \leq .001$.

TABLE 3
Three Sets of Hierarchical Regressions Predicting Problematic Alcohol Use Levels

Step	R ²	ΔR ²	R ² _{Adjusted}	ANOVA	β
Set 1					
1 OAT, HISP	.05	.05	.04	$F(2, 156) = 4.25^*$	.15 (OAT)
					-.16* (HISP)
2 OAT × HISP	.10	.05	.08	$F(3, 155) = 5.60^{***}$	-.02 (OAT)
				$\Delta F = 7.91^{**}$	-.76**** (HISP)
					.65** (OAT × HISP)
Set 2					
1 SAT, HISP	.08	.08	.07	$F(2, 156) = 6.66^{***}$	.22*** (SAT)
					-.14 (HISP)
2 SAT × HISP	.10	.02	.09	$F(3, 155) = 5.93^{***}$	.09 (SAT)
				$\Delta F^a = 4.19^*$	.32* (SAT × HISP)
Set 3					
1 OAT, BLK	.04	.04	.02	$F(2, 156) = 3.02$	.14 (OAT)
					-.10 (BLK)
2 OAT × BLK	.07	.03	.05	$F(3, 155) = 3.83^*$	.20* (OAT)
				$\Delta F^a = 5.27^*$	.45 (BLK)
					-.57* (OAT × BLK)

NOTE: OAT = Obvious Attribute; HISP = Hispanic; SAT = Subtle Attribute; BLK = Black.

^aNot significant after implementing the Bonferroni correction; $\alpha/4 = .013$ for each of the four scales per ethnic group.

*
 $p \leq .05$.

**
 $p \leq .01$.

 $p \leq .005$.

 $p \leq .001$.

TABLE 4

Two Sets of Hierarchical Regressions Predicting Suicide

Step		$\Delta\chi^2$	β	Wald (df = 1)	R	Odds Ratio
Set 1						
1 DEF, BLK	χ^2	41.74****				
	df	2.00				
	BLK		-1.32	2.61	-.06	0.27
	DEF		-0.44	24.95****	-.36	0.65
	Constant		1.37	8.62***		
2 DEF $\times$ BLK	χ^2	2.33				
	df	1.00				
	BLK		-3.94	3.13	-.09	0.02
	DEF		-0.48	24.72****	-.41	0.62
	DEF $\times$ BLK		0.45	2.14	.03	1.57
	Constant		1.59	9.93***		
Set 2						
1 DEF, HISP	χ^2	38.54****				
	df	2.00				
	HISP		-0.16	0.13	.00	0.86
	DEF		-0.46	26.78****	-.37	0.63
	Constant		1.37	7.96***		
2 DEF $\times$ HISP	χ^2	0.05				
	df	1.00				
	HISP		0.06	0.00	.00	1.07
	DEF		-0.44	18.21****	-.34	0.64
	HISP $\times$ DEF		-0.05	0.05	.00	0.96
	Constant		1.31	5.72*		

NOTE: DEF = Defensive; BLK = Black; HISP = Hispanic.

*
p $\leq$.05.

 $p \leq .005$

 $p \leq .0001$

TABLE 5

Cut-Scores, Sensitivity (SN), Specificity (SP), Positive Predictive Power (PPP), Negative Predictive Power (NPP), and Hit Rates (HR) for Substance Abuse Subtle Screening Inventory—Adolescent Scales and Dependent Variables

Scale & Score		SN	SP	PPP	NPP	HR
Alcohol						
FVA ≥	6	61	84	90	48	68
	4	77	71	86	56	75
	3	84	63	84	63	78
	2	92	55	83	74	81
OAT ≥	60	8	98	91	32	35
	50	65	51	75	38	61
	40	92	24	74	55	83
	30	94	18	73	56	71
SAT ≥	70	57	80	87	45	64
	60	71	69	84	50	70
DEF2 ≥	50	91	31	80	59	73
	10	24	94	90	35	45
	8	57	71	82	41	61
ChemDep =	6	83	39	76	50	70
	4	6	98	88	31	34
Drug	1	55	77	85	42	62
Drug						
FVOD ≥	12	50	72	75	47	58
	10	58	62	71	48	60
OAT ≥	8	63	52	68	47	59
	6	72	37	65	44	58
SAT ≥	60	10	98	91	40	44
	50	66	49	68	47	59
SAT ≥	40	90	17	64	50	62
	70	50	60	67	42	54
SAT ≥	60	64	49	67	46	58
	50	85	17	62	41	59

	Scale & Score		SN	SP	PPP	NPP	HR
DEF2 ≥	10		25	92	84	43	51
	8		52	57	66	43	54
	6		80	29	65	48	61
	4		6	97	1	39	41
ChemDep =	1		53	67	73	46	58

NOTE: Base rate (BR) for problematic alcohol use = 70%; for no or nonproblematic alcohol use, BR = 30%. BR for problematic drug use = 62%; for no or nonproblematic drug use, BR = 38%. FVA = Face Valid Alcohol; OAT = Obvious Attribute; SAT = Subtle Attribute; DEF2 = Defensive Dependent versus Defensive Nondependent; ChemDep = Chemically Dependent; FVOD = Face Valid Other Drug. The OAT and SAT are in *T*-scores; all others are in raw scores as indicated in the manual (Miller, 1990).