Identifying Adolescents with Alcohol Problems

A Field Test of the Adolescent Alcohol Involvement Scale

D. Paul Moberg

SUMMARY. A modified version of the Adolescent Alcohol Involvement Scale (AAIS) was administered in a telephone survey and in a longitudinal study. Results indicated acceptable reliability and validity in the AAIS but scores may be unstable in the long run because of the transient nature of alcohol misuse among many adolescents.

IN THE PAST DECADE, the literature (1-12) has been replete with reports of a growing incidence of alcohol problems among adolescents in the U.S. and elsewhere. Using widely varying definitions, these studies have reported that as many as 35% of all adolescents are experiencing alcohol problems. Critics (13-18) have argued for a more cautious and moderate appraisal of the extent of adolescent alcohol problems. Although criticisms have focused on both methodological and definitional issues, it is apparent that the definitional problem is more significant (11, 12, 15, 17, 19).

Mayer and Filstead (20, 21) proposed to overcome some of these definitional problems by defining adolescent alcohol misuse empirically. The present paper reports on a field test of Mayer and Filstead's Adolescent Alcohol Involvement Scale (AAIS), which purports to differentiate alcohol misusers from nonproblem drinkers. The present paper describes the use of a modified version of the AAIS in a large-scale telephone survey and a related longitudinal study. Data are presented on overall scores for several samples, on

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test–retest and internal-consistency measures of reliability, and on
the scale’s validity. Finally, several problems and limitations of the
scale are discussed in light of the problematic nature of defining
and operationalizing adolescent alcohol problems.

Development of the AAIS. The AAIS is an anonymous self-
administered questionnaire (see Appendix for a copy of the scale
and our modification). According to Mayer and Filstead, it is: “a
compilation of previously verified indicators of adolescents’ alcohol
misuse. As such, it appears to have inherent validity. . . . The AAIS
conceptualizes adolescents’ alcohol misuse as drinking to the extent
that it interferes with any one or any combination of three areas:
psychological functioning, social relations and family living (20, p.
292). Fourteen items on the quantity and frequency of drinking,
what beverages are consumed, the situations in which drinking
takes place, and the effects and consequences of drinking are
included in the scale.

The development and validation of the AAIS by Mayer and
Filstead (20, 21) included obtaining ratings of each potential item
from alcoholism treatment personnel, followed by soliciting item
ratings from ten psychiatrists along with their recommendations of
a cut-off point indicative of alcohol misuse. The scale was then
validated using a group-differences method. The authors selected
cut-off points of 0–19 (little or no alcohol use), 20–41 (nonproblem
use), 42–57 (alcohol misuse) and 58–79 ("alcoholic-like" drinkers)
based on the psychiatrists’ ratings and the group means obtained in
their validation procedures.

Method

Survey of Simple Random Sample

In conjunction with a study of the Adolescent Drug and Alcohol
Intervention and Referral (ADAM) demonstration program (described in
more detail by Sizemore et al., 22), a telephone survey of a simple random
sample (SRS) of 1014 youths aged 13-17 in Dane County, Wisconsin, was
undertaken. A major purpose of the survey was to identify a pool of
adolescents from which to select a comparison group composed of both
heavier drinkers and alcohol misusers, not officially identified as such,
and those with random use patterns. Sampling and data collection were
performed during the summer of 1980 by the Wisconsin Survey Research
Laboratory using computer-assisted random-digit dialing. A total of
18,288 telephone numbers were dialed, yielding 1381 (13%) households
with teenagers. Of these, 1266 (92%) provided a parent’s name and
address to enable mailing of an informational letter prior to the actual
telephone interview. After obtaining verbal parental consent, 1014
telephone interviews (80% of those eligible) of a median length of 18 min were completed. For more details on the selection of the comparison group, see Moberg et al.3

The AAIS comprised a major portion of the interview. Since the scale was originally developed as a written questionnaire, it was modified to facilitate telephone interviewing with the constraint that respondents be required to provide only yes-no or numerical responses in order to protect confidentiality should the respondent be overheard. Consequently, many of the 14 items were read to the respondent in total, asking for a yes-no response to each alternative answer for each item. This procedure enabled coding of endorsement or nonendorsement of each alternative answer for all 14 items, as well as assignment of the scale values provided by Mayer and Filstead. Thus, more detail is available for analysis than would have been under the usual forced-choice approach. Although this procedure changed the format of the instrument, the basic structure, wording and scoring of the AAIS remained relatively intact.

One scoring difficulty developed as a result of this format. Item 13, which asks how the respondent feels about his drinking, provides both the response that "it is no problem at all" and the response that "you can control and set limits" on the drinking. The second response yields two points using Mayer and Filstead's scoring protocol. However, given the yes-no response format, 98% of the drinking respondents answered affirmatively to both responses. In this case, rather than following the usual procedure of assigning points based on the highest affirmative response, it was determined that both responses were equivalent given the interview format. Thus, zero points were assigned if both of these responses, but none higher, were endorsed.

Other items included in the survey were a quantity-frequency (Q-F) index of alcohol use, a drug use inventory, a series of questions about formal and informal control experiences related to alcohol use, and several demographic and family-background items.

Test-retest reliability was examined in a sample of 70 respondents who were reinterviewed a mean (± sp) of 25 ± 10.5 days after the initial interview. This sample included 50 randomly selected youths and 20 selected as heavier drinkers (defined as having a Q-F index greater than .5 oz of absolute alcohol per day).

Subjects. Of the 1014 subjects interviewed in the SAS, 47% were male and 53% female. Ages ranged from 12 to 18, with a mean of 15.0 ± 1.4. Ninety-nine percent were enrolled in school. A total of 73% lived with both parents, 16% with mother only, 3% with father only, 6% with one natural parent and a step-parent and 2% in other situations. Only households were sampled; group-home residents and institutionalized youths were excluded because of sampling problems and difficulties in obtaining appropriate consent. Reflecting the demographics of Dane

County, 97% were White. Finally, 24% reported their residence as rural location or farm, 33% as small town or village, and 43% as larger city.

**Quasiexperimental Outcome Study**

In addition to the sas survey, youths entering the adair program and another nonacute intervention program in Dane County were asked to participate in a follow-up study involving 2-hr in-person interviews at entry and at a 1-yr follow-up. Two comparison groups were selected from the sas respondents: (1) a group selected randomly from age-sex blocks approximating the age-sex distribution of the adair sample and (2) a group selected randomly from a pool of heavier drinkers in the sas survey—those defined on the aais as alcohol misusers or alcoholic-like drinkers, as well as those independently classifiable as heavier drinkers (average estimated blood alcohol concentration \( [\text{BAC}] \geq 4 \text{ mg/100 ml per drinking occasion} \)) or steady drinkers (average estimated \( \text{BAC} \geq 2 \text{ mg/100 ml per occasion} \), drinking nine or more times per month).

The Baseline Interview Schedule (nis) and Follow-up Interview Schedule (fis) included all measures used in the sas survey, as well as a large battery of other instruments. As of this writing, all nis and fis data have been collected and analysis is under way. This report emphasizes the sas survey data, since the remaining data are only in the early phases of analysis.

**Results**

The overall distribution of aais scores in five samples is presented in Table 1. Applying Mayer and Filstead's cut-off scores to our sas data, 18% of the respondents were classified as alcohol misusers and 2% as alcoholic-like drinkers. This corresponds closely to Mayer and Filstead's Chicago-area high-school sample in which 15% were misusers and 4% alcoholic-like drinkers.

Bis data for our intervention groups yielded a mean aais score of 44.5 ± 7.6, which is above the cut-off for alcohol misusers. Of the intervention subjects, 66% were classified as alcohol misusers or alcoholic-like drinkers. The random comparison group also provided data consistent with expectations: they obtained a mean aais score of 30.6 ± 12.3, well below the misuser cut-off. Only 17% were alcohol misusers and there were no alcoholic-like drinkers. This subsample's lower rate of abstention than that of the sas subjects was due to the greater mean age of comparison-group subjects selected to approximate the age-sex distribution of our intervention group. Finally, the heavier-drinking comparison-group subsample obtained a mean aais score (41.8 ± 6.6) close to the misuser cut-off; 44% were classified as alcohol misusers and 56% as nonproblem drinkers.
### Table 1.—Distribution and Reliability of AAS Scores in Five Samples

<table>
<thead>
<tr>
<th>Sample</th>
<th>Nondrinker (AAS Score = 0)</th>
<th>Nonproblem Drinker (1-41)</th>
<th>Misser (42-57)</th>
<th>Alcoholic-like (55-70)</th>
<th>Mean ± SD AAS Score</th>
<th>Raw-Score Reliability (Alpha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex Survey</td>
<td>24.8%</td>
<td>55.4%</td>
<td>17.8%</td>
<td>2.0%</td>
<td>19.3 ± 20.6</td>
<td>.962</td>
</tr>
<tr>
<td>Intervention Groups (ass)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparison Group—Random Subsample (ass)</td>
<td>3.0%</td>
<td>30.7%</td>
<td>62.2%</td>
<td>4.1%</td>
<td>44.5 ± 7.6</td>
<td>.553*</td>
</tr>
<tr>
<td>Comparison Group—Heavier-Drinking Subsample (ass)</td>
<td>11.5%</td>
<td>71.8%</td>
<td>16.7%</td>
<td></td>
<td>30.6 ± 12.3</td>
<td>.578</td>
</tr>
<tr>
<td>Mayer and Filteard’s Sample of Chicago-Area High-School Students (20, 21)</td>
<td>11.4%</td>
<td>69.5%</td>
<td>15.1%</td>
<td>4.0%</td>
<td>41.8 ± 6.6</td>
<td>.505*</td>
</tr>
</tbody>
</table>

* The sex survey included 24.8% nondrinkers and 25.0% infrequent drinkers (those that drink one or two times per year). The skip logic for the interview excluded these subjects from the AAS questions. In this table, these subjects are coded as nondrinkers, (AAS raw score = 0) or as nonproblem drinkers (AAS raw score = 2). This coding artificially increased the alpha coefficient. Excluding these subjects, alpha = .763, mean AAS score = 41.5.

* Excluding 11 subjects who reported infrequent drinking or abstention did not alter the alpha level in this sample.

* For regular drinkers only, alpha = .904, mean AAS score = 37.1 ± 7.9, N = 84.

* For all non-subjects combined, alpha = .904, N = 339; excluding abstainers, alpha = .431, N = 265.
These findings are all consistent with expectations, with the intervention group in particular providing additional validation (group-differences method) of the AAISS.

Reliability. The reliability of the AAISS was assessed for each subsample using Cronbach’s alpha, an index of internal consistency of the scale items. The random samples (sas survey and random-comparison group) produced acceptable levels of reliability, both with and without the inclusion of abstainers and infrequent drinkers (see Table 1). The heavier-drinking groups (intervention and heavier-drinking comparison sample) produced lower but still acceptable alpha levels, probably due to the more restricted range of scores in these groups. The correlations of items with total scores in the sas survey data ranged from .42 to .94. Items 13 (how one feels about one’s own drinking) and 14 (how others see one) had the lowest coefficients (.42 and .49; respectively); these were considered the weakest items by Mayer and Filstead (20, p. 297).

The relationship of the scores on each item to the AAISS classification categories (nondrinker, nonproblem drinker, alcohol misuser, alcoholic-like drinker) was analyzed in the total sas sample. A significant observation based on this analysis is that, of the 10% of all drinking respondents who reported having experienced blackouts (response f to item 11), fully 85% were classified as alcohol misusers or alcoholic-like drinkers. Tau c ranged from .18 to .70, and Pearson’s r from .41 to .82. All of the above coefficients and the x²’s were significant at the .001 level. Again, items 13 and 14 had the lowest coefficients. Thus, each item contributed significantly to the overall classification.

The test–retest reliability of the sas data was also assessed (Table 2). The relatively low coefficient for the heavier-drinking subsample is due to predictable regression to the mean among subjects chosen for initially extreme scores. In addition, the natural variation in drinking patterns and problems which occurs over time may have contributed to the instability of AAISS scores in this subsample. Finally, since the scores of heavier drinkers fluctuated within a limited range of relatively high scores, somewhat lower correlations were expected. Low correlations within a high range are not necessarily indicative of unreliability if AAISS classification is used rather than raw scores.

The short-term reliability of AAISS classification was examined using a 2 × 2 table in which the AAISS was collapsed to demonstrate the distinction of most interest (alcohol misusers and alcoholic-like
Table 2.—Test-Retest Reliability of the AAS in Three Subsamples and Total Sample

<table>
<thead>
<tr>
<th></th>
<th>Mean ± SD AAS Score</th>
<th>Pearson Correlation of AAS 1 with AAS 2</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interrater, Random Sample</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAS 1</td>
<td>20.1 ± 23.6</td>
<td>.90</td>
<td>21</td>
</tr>
<tr>
<td>AAS 2</td>
<td>24.1 ± 23.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Test-Retest, Random Sample</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAS 1</td>
<td>19.6 ± 22.9</td>
<td>.77</td>
<td>21</td>
</tr>
<tr>
<td>AAS 2</td>
<td>17.9 ± 20.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Test-Retest, Heavier Drinkers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAS 1</td>
<td>48.4 ± 5.8</td>
<td>.41</td>
<td>11</td>
</tr>
<tr>
<td>AAS 2</td>
<td>46.9 ± 7.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Reliability Sample</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAS 1</td>
<td>27.6 ± 23.6</td>
<td>.58</td>
<td>67</td>
</tr>
<tr>
<td>AAS 2</td>
<td>25.4 ± 22.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The mean time from initial telephone interview to reinterview was 25.5 ± 10.5 days (range, 10–90). Partialling out the number of days from test to retest had no effect on the correlations. AAS 1 indicates the first administration, AAS 2 the second.

x Two outliers were deleted from the heavier-drinking group—(1) a 13-year-old boy who reported extremely high level of alcohol use initially and no use at the second administration, and was inconsistent internally in all responses at both administrations; and (2) a 17-year-old boy who at the initial interview was an extremely heavy drinker (Q0 > 1.6), but in the second interview reported that he was “trying to reform,” and had a Q0 near zero and a much lower AAS score. Deletion of these outliers raised the AAS correlations from .10 to .41 for this subsample and the Q0 correlations from .03 to .74.

drinkers vs others). The test-retest relationship was highly significant ($\chi^2 = 40.73$, 1 df, $p < .001$; Phi = .77). Of the 36 abstainers and nonproblem drinkers in the initial survey, 35 retained that classification over the average of 25 days from test to retest. Of the 32 initial alcohol misusers and alcoholic-like drinkers, seven were classified as nonproblem drinkers at retest. None of the three initial alcoholic-like drinkers moved into the category of nonproblem drinker. Of the 29 initial alcohol misusers, two were alcoholic-like drinkers and seven were nonproblem drinkers at the time of the reinterview. Those classified as alcohol misusers or alcoholic-like drinkers decreased from 47 to 38% in this sample (in which heavier drinkers had been oversampled).

An indication of the long-term instability of the AAS (or the behavior that it measures) is provided by the heavier-drinking subsample (see Table 1). At the time of the initial telephone survey all members of this subsample were classified as alcohol misusers or alcoholic-like drinkers, since this was a criterion for inclusion in this group of heavier drinkers. Six months to one year later, however
when the BIS was administered to these subjects, 56% were reclassified as nonproblem drinkers. One year later, at the time of the follow-up interview, more turnover was noted. Ten (48%) of those who had been reclassified as nonproblem drinkers at the second interview were again classified as alcohol misusers or alcoholic-like drinkers. However, five (28%) of those who had fit this classification at the two prior interviews were classified as nonproblem drinkers at the third interview. This reduction in the apparent rate of alcohol problems over time is probably due to a combination of several factors: regression to the mean, normal fluctuation in drinking patterns and problems, the refusal of heaviest drinkers to participate in the longitudinal study and differences in methodology (the AAIS was administered as a written questionnaire in the BIS and as a telephone interview in the SNS survey).

The random sample also evidenced long-term instability in alcohol misuse as reflected by the AAIS. Ninety-seven adolescents randomly selected from the SNS sample were interviewed in-person six months to one year later (BIS) and again one year thereafter (BIS), providing three data points over an 18-24-month period. Over this time period, 33 (34%) of the random-sample subjects were classified as alcohol misusers or alcoholic-like drinkers at least once. However, 15.5% were classified thus only once, 11.3% twice and only 7.2% at all three points of measurement. Thus, 45% of those identified over time as alcohol misusers or alcoholic-like drinkers by the AAIS were identified as such at only one of the three points of measurement. Of those identified as alcohol misusers or alcoholic-like drinkers in the telephone survey, 53% were nonproblem drinkers at the second (BIS) interview. In turn, of those identified at the second interview as problem drinkers, 31% were no longer classified thus by the time of the third interview. In contrast, only 9% of 78 nonproblem drinkers in the telephone survey moved into the category of alcohol misusers or alcoholic-like drinkers by the second interview. Sixteen percent moved from the nonproblem range at the second interview to the problem range at the third data point. Given that regression to the mean was not a factor in the longitudinal variation in alcohol misuse in this random sample, these data provide evidence of the transitory nature of alcohol misuse for many adolescents.

Validity. Several indications of the AAIS's validity have been presented above. These include the differences in scores between
the intervention samples, random samples and heavier-drinking samples, and the similarity of random-sample scores with the distributions of scores obtained in other studies.

Another set of analyses sought to establish validity by correlating AAIS scores with other independent variables presumably indicative of alcohol problems. The literature (e.g., 23) suggests at least three dimensions of alcohol problems—symptoms of alcohol problems, adverse effects of alcohol and frequent or heavy consumption. The AAIS taps each of these domains. In addition, separate items were included in the telephone survey which assessed consumption and adverse effects. Table 3 presents data related to one indicator of the adverse effects of or consequences from alcohol—“getting in trouble” with law-enforcement officials, parents or school officials because of the use of alcohol or other drugs. Respondents could endorse none, one, two or all three of these sources of trouble. As Table 3 indicates, there was a significant linear relationship between the number of items endorsed and AAIS scores.

Another indicator of alcohol problems is heavy or frequent alcohol consumption. The AAIS raw score correlated with a standard Q-F measure at $r = .51$. Robertson and Downs have developed a typology of adolescent drinking styles based on the quantity and frequency of alcohol consumption. These categories

<table>
<thead>
<tr>
<th>Number of Trouble Items Endorsed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (N = 781)</td>
<td>24.9</td>
</tr>
<tr>
<td>1 (148)</td>
<td></td>
</tr>
<tr>
<td>2 (55)</td>
<td></td>
</tr>
<tr>
<td>3 (15)</td>
<td></td>
</tr>
<tr>
<td>Total (999)</td>
<td></td>
</tr>
</tbody>
</table>

**AAIS Category (%)**

- Nondrinker: 30.3, 5.4, 7.3, 24.9
- Nonproblem drinker: 60.8, 39.9, 27.3, 13.3, 55.2
- Alcohol misuser: 8.7, 51.4, 52.7, 40.0, 17.9
- Alcoholic-like drinker: 0.1, 3.4, 12.7, 46.7, 2.0

N as % of row: 78.2, 14.8, 5.5, 1.5, 100.0

Mean ± sd AAIS Score:

- 14.3 ± 17.7
- 35.4 ± 19.7
- 37.8 ± 22.1
- 53.4 ± 17.1
- 19.3 ± 20.6

$^*$ $\chi^2 = 43.53$, $p < .001$; $r = .40$; gamma = .78.

$^*$ $F = 93.82$, $p < .001$.

include abstainer, occasional drinker (1–4 drinks per occasion 1–8 times per month), steady drinker (1–4 drinks per occasion 9 or more times per month), occasional heavy drinker (5 or more drinks per occasion 1–8 times per month) and consistent heavy drinker (5 or more drinks per occasion 9 or more times per month). The correlation between this consumption typology and AAIS classification ($r = .69$) was significant at $p < .001$.

Another indicator of the AAIS's validity is its correlation with the use of other drugs, marihuana in particular. As Jessor et al. (24) and Brauch (25) indicated, there is a high correlation between alcohol problems, marihuana use and other problem behaviors among adolescents. High AAIS scores are thus expected to be related to the use of marihuana as well as other drugs. The sas survey discriminates those who have never used drugs from those who have "quit" using drugs and those who currently use a number of drugs. For all common drugs (excluding heroin and methadone, which only one respondent reported ever having used), there was a significant ($p < .001$) relationship between past and present use and AAIS classification and raw score. For example, 57% of current marihuana users were classified as alcohol misusers or alcoholic-like drinkers by the AAIS. Of those who claimed never having used marihuana, only 5% were classified as alcohol misusers and none as alcoholic-like drinkers. Of the 21% of the respondents reporting current use of any drug listed, 48% were alcohol misusers and 9% alcoholic-like drinkers, compared with 10 and 0.3%, respectively, of those reporting no current use of other drugs. The AAIS mean for users of any drug was 40.1 ± 16.9 vs 13.9 ± 17.9 for nonusers. Fifty-six percent of the alcohol misusers and 90% of the alcoholic-like drinkers reported current use of at least one other drug.

A final potential indicator of the validity of the AAIS is independent clinical assessment. Two registered nurses and one social worker in the ADAM program assessed the alcohol use of 113 adolescent intervention patients who subsequently consented to be interviewed for the evaluation-research component of this project. As part of the independently conducted bis, the AAIS was administered in its original questionnaire form. The clinicians' assessments (derived during one to four sessions with each patient and his parents) were based on clinical judgment combined with a summary checklist of dysfunctions in the areas of school, family, peers, law enforcement, alcohol use, use of other drugs, and physical and psychological health. The consequent assessments ranged from "no alcohol problem" to "dependent on alcohol—severe problem."
Table 4 presents data on the relationship between AAIS scores and classification and clinical assessment, demonstrating significant differences in mean AAIS scores across clinical-assessment categories. None of those assessed as "dependent" were classified as nonproblem drinkers by the AAIS; conversely, none of those assessed as having no alcohol problem were classified as alcoholic-like drinkers by the AAIS. Row percentages for the table (not shown) indicate that 86% of those classified as alcoholic-like drinkers by the AAIS were assessed as dependent by clinicians. These data indicate a strong linear relationship, but also that the AAIS cut-off distinguishing alcohol misusers from alcoholic-like drinkers may be too high. The raw-score data indicate that all patients assessed as dependent scored at least 42 (the cut-off for alcohol misuser) on the AAIS, and that 75% scored above 50. Their mean of 54 may be a better choice of a cut-off for alcoholic-like drinking than the score of 58 recommended by Mayer and Filstead.

Although these data lend credence to the internal consistency, short-term stability (reliability) and validity of the AAIS, several potential problems may be associated with the use and interpretation of the instrument. Foremost among these is the high correlation (.41) of AAIS raw scores with age (Table 5). By age 17, 38% of the respondents (30% of the girls and 46% of the boys) were classified as alcohol misusers or alcoholic-like drinkers, a proportion which appears excessively high, particularly for the boys.

**Table 4.** Relationship of the AAIS to Clinicians' Independent Assessments of Patients' Drinking Behavior

<table>
<thead>
<tr>
<th>AAIS Category (%)</th>
<th>No Drinking Problem (N = 16)</th>
<th>Slight Problem (45)</th>
<th>Moderate Problem (38)</th>
<th>Severe Problem (14)</th>
<th>Total (113)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonproblem drinker</td>
<td>50.0</td>
<td>35.6</td>
<td>23.7</td>
<td>29.2</td>
<td></td>
</tr>
<tr>
<td>Alcohol misuser</td>
<td>50.0</td>
<td>62.2</td>
<td>76.3</td>
<td>57.1</td>
<td>64.6</td>
</tr>
<tr>
<td>Alcoholic-like drinker</td>
<td>2.2</td>
<td></td>
<td>42.9</td>
<td>6.2</td>
<td></td>
</tr>
<tr>
<td>N as % of row</td>
<td>14.2</td>
<td>39.8</td>
<td>33.6</td>
<td>12.4</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Mean ± sd AAIS Score:

- 39.2 ± 7.7
- 43.9 ± 6.8
- 45.6 ± 6.2
- 54.2 ± 6.4
- 45.1 ± 7.6

* χ² = 43.8, p < .001, r = .41, gamma = .50.*
* f = 13.74, p < .001.*
Table 5.—Relationship of the AAI<sub>5</sub> to Age in the Simple Random Sample

<table>
<thead>
<tr>
<th>Age</th>
<th>13 (N = 188)</th>
<th>14 (198)</th>
<th>15 (211)</th>
<th>16 (226)</th>
<th>17 (183)</th>
<th>Total (1004)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAIS Category (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nondrinker</td>
<td>51.6</td>
<td>23.8</td>
<td>23.1</td>
<td>12.4</td>
<td>10.4</td>
<td>24.8</td>
</tr>
<tr>
<td>Nonproblem drinker</td>
<td>44.1</td>
<td>63.1</td>
<td>57.3</td>
<td>58.8</td>
<td>51.9</td>
<td>55.4</td>
</tr>
<tr>
<td>Alcohol misuser</td>
<td>4.3</td>
<td>8.6</td>
<td>16.6</td>
<td>23.9</td>
<td>35.3</td>
<td>17.8</td>
</tr>
<tr>
<td>Alcoholic-like drinker</td>
<td>1.5</td>
<td>0.9</td>
<td>4.9</td>
<td>2.2</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>N as % of row</td>
<td>18.5</td>
<td>19.7</td>
<td>21.0</td>
<td>22.5</td>
<td>18.2</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Mean ± SD AAIS Score<sup>a</sup> | 7.0 ± 13.1 | 12.9 ± 17.9 | 18.6 ± 20.1 | 26.5 ± 21.0 | 30.9 ± 20.2 | 19.3 ± 18.8 |

<sup>a</sup> χ<sup>2</sup> = 171.1, p < .001; r = .77; gamma = .46.
<sup>b</sup> F = 51.3, p < .001; r = .54.

Another related concern is that, given the nature of the items, relatively innocent behavior could be interpreted as alcohol misuse (but probably not as alcoholic-like drinking) by this scale, much in the manner of the scenarios provided by Keller (18) and by Marden and associates (16) in their critiques of the literature on adolescent alcohol problems, in general, and the study conducted by the Research Triangle Institute in 1974 (10, 12), in particular.

The formulation of individual items is also potentially problematic. For example, the more recently a respondent drank, the higher the score on item 2, even though this is likely to be affected by the day of the week on which the instrument is administered since most adolescent drinking occurs on weekends. The question on sources of alcohol (item 5) neglects purchase without identification and the common scheme whereby minors have adults purchase alcohol for them. Usually drinking until high or drunk is considered more serious than usually drinking six or more drinks (item 9), regardless of body weight, length of drinking time and other factors; being high or drunk is not defined for the respondent. It is considered more serious to have been ill from drinking than to have been drunk (item 11). Also, having gotten into trouble at home because of drinking is rated as more serious than drinking's having interfered with schoolwork or having caused the loss of friends (item 12). Also, there is no question on the AAIS concerning drinking and driving, perhaps the most acute problem of adolescent drinking.
behavior. (Forty-nine percent of the drinkers in our sample reported having drunk in cars.)

Despite these inconsistencies and ambiguities, the scale as a whole does seem to "work." Perhaps this is due to the choice of cutoffs such that a high-scoring response on any one particular item is never sufficient for classification as an alcohol misuser or alcoholic-like drinker; rather, a pattern of high scores on many items is required. Thus, the anomalies mentioned above in the scoring of particular items have a minimal effect on the total score. Since many of the experiences assessed by the AAIS can be considered part of normal development, it is only when these aggregate to form a pattern potentially indicative of problems that the scale classifies the respondent as an alcohol misuser and, especially, as an alcoholic-like drinker.

**Discussion**

These analyses have several implications for the conceptualization of adolescent alcohol use and alcohol problems. By using "empirical procedures for defining adolescent alcohol misuse," as Mayer and Filstead (21) characterize their work, conceptual clarity is easily lost to empirical concerns and operationalism. A clear conceptualization of what constitutes "normal" alcohol use, as opposed to misuse, remains elusive as a result of the positivistic empiricism of this approach. For example, Mayer and Filstead suggest that adolescent alcohol problems are multidimensional, and the items of the AAIS do in fact tap many dimensions. The resultant single score and typology, however, are operationally unidimensional. Although Mayer and Filstead extracted three primary factors from their data, these were not pursued, let alone labeled, in their published work (20, 21) on the scale.

Similarly, although the patterns, consequences and problems of alcohol use may have greatly differing meanings at different stages of adolescent development, Mayer and Filstead failed to pursue this issue beyond reporting the significant age differences which they found and calling them unexpected. It is of concern that 38% of all 17-year-olds in our sample are misusing alcohol (or worse) according to the AAIS. As Blane (26), Clark and Midanik (27), the NIAAA (28) and Cahalan and Room (29) have found, the highest percentages of reported alcohol problems occur in the age group 18 to 20 (or 25). The increasing rate of the classification of alcohol misuse on the AAIS with age in adolescent samples might be an accurate
indication of increasing problems, but not necessarily of increasing alcoholism, with age (30). Nonetheless, differential age norms or age-specific cut-offs should be developed for the AAIS.

A further issue of major significance is the stability of alcohol problems over time, particularly that of alcohol misuse and alcoholic-like drinking. As the data on the heavier-drinking and random subsamples indicate, subjects who are alcohol misusers at one point in time are not necessarily in that category at a later point in time. Over a six-month to one-year time span, 56% of subjects selected initially as heavier drinkers for our comparison group (based on two criteria, one of which was AAIS classification as an alcohol misuser or alcoholic-like drinker on the SNS survey) became nonproblem drinkers in terms of their AAIS responses. Even on the short-term test-retest, 43% of the subjects sampled became noneligible based on the two criteria for comparison-group membership. Since over one-half of the alcohol misusers in our random sample could also no longer be classified thus six months to one year later, regression to the mean is not a sufficient explanation for these long-term changes in rates of alcohol misuse.

As Polich et al. (23), as well as Cahalan and Room (29), demonstrated with adult populations, drinking problems wax and wane throughout one’s lifetime. Our data support the conclusion that among adolescents, a high rate of transitory alcohol misuse may exist at any one point in time, but that this does not necessarily indicate a stable, permanent or progressive condition requiring intensive treatment or meriting widespread societal concern. In this regard, the term misuse appears to be an appropriate label for these youths, signifying moderate problems which are often likely to be transient experiences. Prevention and short-term intervention may be appropriate for these youths, but probably not formal treatment. Other researchers who study adolescents’ drinking practices and problems are urged to take a longitudinal, rather than cross-sectional, approach to represent the phenomenon under study more realistically.

Social problems and the data about them are produced and used by various groups in society for individual, group and organizational ends (31, 32). Problems are constructed in a definitional process of claims-making activity. Chauncey (14) described the process by which the NIAAA became one of the initial claims-making groups producing the “epidemic” of adolescent “alcoholism” in the early to mid-1970s. Similarly, Trice and Roman (33) discussed the
alcoholism industry as a key claims-making group, whose interest in
the early 1970s was in identifying and treating adult alcoholics.
Now, the alcoholism-treatment sector has expanded to compete for
the business of treating teenage "alcoholics." McKnight (34, p. 74)
points out that "the client is less a person in need than a person who
is needed" in our professionalized service society. In this context,
there is the danger that researchers who, for example, survey
adolescents concerning their drinking practices will become what
Gouldner (35) has characterized as "market researchers for the
welfare state." It is because of these concerns that cautious
interpretation and use of data such as those presented here are
needed, particularly given our finding of the transitory nature of
the misuse pattern.

Adolescents scoring in the alcoholic-like range on this instrument
(about 2% of the random sample and probably somewhat under-
represented) are another matter. Although comprising only a small
percentage of the sample, it appears that these respondents are in
more stable and severe patterns of misuse, are probably in need of
treatment and may be at risk for adult alcoholism. It is toward this
relatively small percentage of youths that our concern should be
directed. As Keller (18, p. 254) suggests:

Remedially we can stop worrying about the 6 million adolescent so-called
problem drinkers and concentrate on and concern ourselves with perhaps
600,000 susceptible young people who have begun consistently to use
alcohol in such a way that we may suspect they have entered the process of
learning to be alcoholics. . . . [We] should stop wasting ourselves on
those ever popular broad-based scattershot legislative and propagandistic
measures aimed at somehow containing that imaginary army of 6 million
adolescent problem drinkers. . . .

Methodologically, this research has indicated the utility of
random-digit dialing techniques for sampling and interviewing
adolescents by telephone even when sensitive topics such as alcohol
and drug use are concerned. The findings concerning the rates of
use of alcohol and other drugs coincide almost precisely with an
anonymous-questionnaire survey administered in Dane County
schools one year prior to the telephone sampling, adding to our
confidence in the validity of these data. By using careful safeguards
for confidentiality, such as structuring the questions so that only
yes-no or numerical responses were required from the respondent,
and by establishing legitimacy for the interviews in advance by
sending letters to potential respondents, valid data can be obtained
by telephone at much lower costs than in in-person interviews.
As Jacobson and associates (36, 37) have demonstrated with adult populations, there will always be disagreement among various alcoholism-screening devices, as well as between screening devices and clinical diagnosis. Ultimately, the determination of alcohol misuse or alcoholism is a clinical judgment which must be cautiously rendered over an extended period of time to avoid labeling possibly transitory misusers as alcoholic-like drinkers. The AAIS is a useful research tool, if interpretation of findings is judicious and care is taken to distinguish alcoholic-like drinkers from misusers. Although a high rate of transitory alcohol misuse may exist at any point in time, extreme caution must be exercised in producing, interpreting and communicating survey findings which purport to estimate the number of youths with alcohol problems of sufficient severity and permanence to be of concern for treatment (vs only prevention and short-term intervention).

APPENDIX

The Adolescent Alcohol Involvement Scale:

Original Questionnaire Items (Q) and Modifications for Administration in Telephone Interview (I)

(Scores of responses in parentheses)

Item 1

Q. How often do you drink?

a. Never (0)

b. Once or twice a year (2)

c. Once or twice a month (3)

d. Every weekend (4)

e. Several times a week (5)

I. Now I have some questions about alcohol use. I'll ask them so that you can give "yes" or "no" for an answer and you'll know what the questions are about. Just say "yes" when I reach the answer that best fits you. First: How often do you typically have a drink containing alcohol? Would it be:

1. Every day? (6)

2. Several times a week? (5)

3. Every weekend? (4)

4. Once or twice a month? (3)

5. Once or twice a year? (2) [SKIP OUT]

6. Never? (0) [SKIP OUT]

Item 2

Q. When did you have your last drink?

a. Never drank (0)

b. Not for over a year (2)

c. Between 6 months and 1 year ago (3)

d. Several weeks ago (4)

e. Last week (5)

f. Yesterday (6)

g. Today (7)

I. When did you have your last drink? As before, stop me when I read the best answer for you. Was it:

1. Today? (7)

2. Yesterday? (6)

3. Last week? (5)

4. Several weeks ago? (4)

5. Between 6 months and a year ago? (3)

6. Not for over a year? (2)
ALCOHOL PROBLEMS IN ADOLESCENTS

Item 3
Q. I usually start to drink because:
   a. I like the taste (1)
   b. To be like my friends (2)
   c. To feel like an adult (3)
   d. I feel nervous, tense, full of worries or problems (4)
   e. I feel sad, lonely, sorry for myself (5)
I. I'll read some reasons people may have for taking a drink. Please tell me if each one is or is not a reason you may have for drinking. First:
   A. You like the taste (1)
   B. To be like your friends (2)
   C. To feel like an adult (3)
   D. You feel nervous, tense, full of worries or problems (4)
   E. You feel sad, lonely, kind of sorry for yourself (5)

Item 4
Q. What do you drink?
   a. Wine (1)
   b. Beer (2)
   c. Mixed drinks (3)
   d. Hard liquor (4)
   e. Substitute for alcohol—paint thinner, sterno, cough medicine, mouthwash, hair tonic, etc. (5)
I. The questions that follow cover a wide range of drinking patterns. They are meant to include people who only drink a little bit to those who drink heavily. Even though some questions may not seem to apply to you, we want you to understand that we have to ask everyone the same set of questions. Do you drink:
   A. Wine? (1)
   B. Beer? (2)
   C. Mixed drinks? (3)
   D. Hard liquor? (4)
   E. Any substitute for alcohol? (5)

Item 5
Q. How do you get your drinks?
   a. Supervised by parents (1)
   b. From brothers or sisters (2)
   c. From home without parents' knowledge (3)
   d. From friends (4)
   e. Buy it with false identification (5)
I. Just answering "yes" or "no" for every answer I read, did you ever get drinks from:
   A. Your parents or relatives? (1)
   B. Your brothers or sisters? (2)
   C. From home without your parents' knowledge? (3)
   D. From friends? (4)
   E. Did you buy them with false identification? (5)

Item 6
Q. When did you take your first drink?
   a. Never (0)
   b. Recently (2)
   c. After age 15 (3)
   d. At ages 14 or 15 (4)
   e. Between ages 10 and 13 (5)
   f. Before age 10 (6)
I. How old were you when you had your first drink—not just a sip from someone's glass?
Age: __________

Item 7
Q. What time of day do you usually drink?
   a. With meals (1)
   b. At night (2)
   c. Afternoons (3)
   d. Mostly in the morning or when I first awake (4)
   e. I often get up during my sleep and drink (5)
I. What time of day do you usually drink? Please stop me when I read the correct response for you.
   1. Do you often get up during the night and have a drink? (5)
   2. Is it mostly in the morning or when you first awake? (4)
   3. In the afternoon? (3)
   4. At night? (2)
   5. With meals? (1)

Item 8
Q. Why did you take your first drink?
   a. Curiosity (1)
   b. Parents or relatives offered (2)
   c. Friends encouraged me (3)
   d. To feel more like an adult (4)
   e. To get drunk or high (5)

1. Again answering “yes” or “no” for each reason I read, why did you take your first drink?
   Was it because:
   A. You were curious? (1)
   B. Your parents or relatives offered it? (2)
   C. Your friends encouraged it? (3)
   D. You wanted to feel more like an adult?
   E. You wanted to get drunk or high? (5)

Item 9
Q. How much do you drink, when you do drink?
   a. 1 drink (1)
   b. 2 drinks (2)
   c. 3–6 drinks (3)
   d. 6 or more drinks (4)
   e. Until high or drunk (5)

1. When you do drink, how much do you usually drink? Stop me at the answer that best fits you. First:
   1. Until you’re high or drunk? (5)
   2. More than 6 drinks? (4)
   3. 3–6 drinks? (3)
   4. 2 drinks? (2)
   5. Just 1 drink? (1)

Item 10
Q. Whom do you drink with?
   a. Parents or relatives
      only (1)
   b. With brothers or sisters only (2)
   c. With friends your own age (3)
   d. With older friends (4)
   e. Alone (5)

1. Whom do you usually drink with? Answer “yes” or “no” for each answer I read, but don’t say yes unless you’ve drunk more than two times with each. First:
   A. Parents or relatives? (1)
   B. Brothers or sisters? (2)
   C. Friends your own age; that is, in your own grade? (3)
   D. With older friends? (4)
   E. When you are alone? (5)

Item 11
Q. What is the greatest effect you have had from alcohol?
   a. Loose, easy feeling (1)
   b. Moderately high (3)
   c. Drunk (3)
   d. Became ill (4)
   e. Passed out (5)
   f. Was drinking heavily the next day; didn’t remember what happened (6)
ALCOHOL PROBLEMS IN ADOLESCENTS

I. What are the effects you have had from drinking? Please answer "yes" or "no" for each of the effects I'll read. First:
   A. Have you ever had a loose, easy feeling, or gotten a buzz on, from drinking? (1)
   B. Gotten moderately high? (2)
   C. Gotten really high or drunk? (3)
   D. Gotten sick and thrown up? (4)
   E. Passed out from drinking? (5)
   F. Have you ever drunk heavily and the next day didn't remember what happened? (6)

Item 12
Q. What is the greatest effect drinking has had on your life?
   a. None—no effect (0)
   b. Has interfered with talking to someone (2)
   c. Has prevented me from having a good time (3)
   d. Has interfered with my schoolwork (4)
   e. Have lost friends because of drinking (5)
   f. Has gotten me into trouble at home (6)
   g. Was in a fight or destroyed property (7)
   h. Has resulted in an accident, an injury, an arrest or being punished at school for drinking (8)

I. What are the social effects—if any—you might have had from drinking? For example, has it:
   A. Caused problems when you were just talking to someone? (2)
   B. Kept you from having a good time? (3)
   C. Interfered with your schoolwork? (4)
   D. Caused you to lose a friend? (5)
   E. Gotten you in trouble at home? (6)
   F. Caused you to get into a fight or destroy property? (7)
   G. Caused an accident, an injury, an arrest or any school punishment? (8)

Item 13
Q. How do you feel about your drinking?
   a. No problem at all (0)
   b. I can control it and set limits on myself (2)
   c. I can control myself, but my friends easily influence me (3)
   d. I often feel bad about my drinking (4)
   e. I need help to control myself (5)
   f. I have had professional help to control my drinking (6)

I. How do you feel about drinking? For example:
   A. Do you feel your drinking is no problem at all? (0)
   B. Do you feel you can control and set limits to your drinking? (2)
   C. Do you feel that your friends easily influence you to drink more than you want to? (3)
   D. Do you feel bad or guilty about your drinking? (4)
   E. Do you need help to control your drinking? (5)
   F. Have you had professional help to control your drinking? (6)

Item 14
Q. How do others see you?
   a. Can't say, or a normal drinker for my age (0)
   b. When I drink, I tend to neglect my family or friends (2)
   c. My family or friends advise me to control or cut down on my drinking (3)
   d. My family or friends tell me to get help for my drinking (4)
   e. My family or friends have already gone for help for my drinking (5)
1. How do most of your friends see you? For example:
   A. Do your friends see your drinking as normal for your age? (0)
   B. When you drink, do you tend to neglect your friends? (2)
   C. Do your friends ask you to control or cut down on your drinking? (3)
   D. Have your friends told you to get help for your drinking? (4)
   E. Have your friends tried to get help for you because of your drinking? (5)

1. How does your family see you? For example:
   A. Does your family see your drinking as normal for your age? (0)
   B. When you drink, do you tend to neglect your family? (2)
   C. Does your family ask you to control or cut down on your drinking? (3)
   D. Has your family told you to get help for your drinking? (4)
   E. Has your family tried to get help for you because of your drinking? (5)

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