ALCOHOL USE INVENTORY: SCREENING AND ASSESSMENT OF FIRST-TIME
DRIVING-WHILE-IMPAIRED OFFENDERS.
I. RELIABILITY AND PROFILES

I. CHANG*, S. C. LAPHAM and K. W. WANBERG†

Behavioral Health Research Center of the Southwest, 6624 Gulton Court NE, Albuquerque, NM 87109 and
†Clinical Psychology, 16050 West 69th Place, Arvada, CO 80007, USA

(Received 10 August 1999; in revised form 17 August 2000; accepted 17 September 2000)

Abstract — This study evaluated the use of the Alcohol Use Inventory (AUI) in a drink-driving offender population court-mandated to attend a screening programme. We compared offenders’ scale scores, reliability statistics and profiles to those from two clinical populations on which the AUI was normed. Among offenders, males and females had similar levels of involvement with alcohol, and Native Americans had higher scale scores than other ethnic groups. Comparisons with the normative population revealed lower mean scale scores and lower reliability scores among offenders. Differences between the offender and normative populations were most pronounced for the primary scales. We also found inconsistencies in offenders’ responses to certain questions. To address this, we recommend that, when using the AUI for screening offenders: (1) screeners place more emphasis on second- and third-order scales than primary scales; (2) lower cut-off points be used for identifying problem drinkers; (3) counsellors conduct in-person interviews with clients to develop rapport and encourage self-disclosure.

INTRODUCTION

Many jurisdictions in the USA use alcohol screening programmes to evaluate the substance abuse problems of driving-while-impaired (DWI) offenders and to determine offenders’ needs for further assessment and treatment (Popkin et al., 1988; Beirness, 1991). The goal of these programmes is to prevent recidivism through early identification and treatment of problem drinkers. Screening can be categorized into three activities: testing, interviewing, and monitoring. Testing refers to the use of self-report assessment instrument(s) to evaluate the offender’s alcohol and drug use. Interviewing involves specially trained personnel who meet with offenders to further elucidate circumstances of the arrest and to learn about family, medical, personal, or legal problems that may indicate a need for treatment services. Monitoring involves tracking clients’ progress through the system and assessing their compliance with court-initiated treatment.

However, for the evaluation of alcohol problems, assessment can include another level beyond screening — in-depth differential assessment (Wanberg and Horn, 1987; Jacobson, 1989; Wanberg and Milkman, 1998). In the screening level of assessment, inclusion criteria and psychometric testing are used to determine whether the client has an alcohol problem and whether the individual is a candidate for treatment referral. In the second level, in-depth differential assessment, the distinct conditions associated with alcohol use are identified in order to provide a more comprehensive understanding of the progress, process, and existing conditions of the individual and to formulate a treatment plan (Wanberg and Milkman, 1998).

DWI screening and initial assessment programmes differ in how they use and integrate these two levels of assessment. Some programmes conduct only a simple screening to determine whether the client should be referred for further assessment. These programmes typically use a brief self-report instrument that may or may not include an interview. Other programmes screen more extensively, providing referral guidelines and recommendations for specific treatments.

For screening and initial assessment, many standardized instruments have been used (see Allen and Columbus, 1995, for a comprehensive review of alcohol assessment instruments). Most instruments, however, were normed on populations other than DWI offenders and were not developed specifically for use in a court-mandated setting. Instruments for which normative data have been collected from DWI offender populations include the Michigan Alcohol Screening Test (MAST) (Selzer, 1971), the Mortimer–Filkins Questionnaire (Webb, 1990), the Driver Risk Inventory (DRI) (Behavior Data Systems, Ltd, 1997), the Substance Abuse Life Circumstance Evaluation (SALCE) (ADE Inc, 1986), and the Lovelace Comprehensive Screening Instrument (Lapham et al., 1996). All have been evaluated for usefulness in predicting problem drinking or DWI recidivism (Lacey et al., 1997). Beirness (1991), who reviewed 20 instruments used in DWI screening, and Popkin et al. (1988) suggested that future research is needed to provide normative statistics/profiles and to evaluate the predictive validity of these instruments for DWI populations.

One instrument that has been used to screen and differentially assess DWI offenders is the Alcohol Use Inventory (AUI) (Horn et al., 1990). The AUI was normed on clients diagnosed and hospitalized for alcohol abuse and/or dependence. Reliability and validity studies were conducted primarily with clients in residential care or out-patient (non-DWI) settings (Horn et al., 1990). No previous studies have examined the reliability of the AUI in a DWI setting. This is a significant omission, which the present study aims to address. DWI offenders may differ from alcohol patients in traditional treatment programmes (Vingilis, 1983), and the differences are found across demographic, social, and psychological characteristics, as well as alcohol involvement in terms of consumptions, perceived benefits, and psychological/physiological

*Author to whom correspondence should be addressed.
symptoms from drinking (Vingilis, 1983). Most important, DWI offenders have distinguished themselves for their higher prevalence rates of deviant behaviour and involvement in the criminal justice system for reasons other than impaired driving (Jessor, 1987; Donovan, 1993). Moreover, as Chang and Lapham (1996) found, DWI clients are reluctant to comply with court mandates and frequently under-report their own past criminal behaviours. Because of this defensiveness in DWI offenders’ self-reporting, psychometric instruments often do not provide a veridical description of alcohol use patterns for these clients. For these reasons, we set out to evaluate the AUI’s efficacy as a DWI screening tool.

The Lovelace Comprehensive Screening Program (LCSP) used the AUI to assist counsellors in identifying problem drinkers among first-time DWI offenders referred for screening (Lapham et al., 1995). In this study, we worked with the New Mexico Traffic Safety Bureau, which provided offenders’ traffic records from the time of arrest up until the end of December 1996. The availability of the AUI data and the traffic records provided a unique opportunity to evaluate AUI for predictive validity of drink-driving recidivism.

Because the AUI was developed according to a multiple-condition theory, the present study’s design also adhered to the framework of such a theory. Briefly, multiple-condition theories posit that problem drinkers differ in their perceptions of benefits derived from drinking, styles of drinking, ideas about the consequences of drinking, and thoughts about how to deal with drinking problems. These characteristics form patterns that reflect various underlying profiles or typologies. Multiple-condition theories should be differentiated from unitary-condition theories, which postulate distinct stages in the development of alcoholism, assuming that all alcoholics experience a similar developmental process from an early to a later stage of alcoholism.

The objective of this study was to provide reliability statistics and normative data/profiles for a DWI population. Reliability and profile studies were conducted on the multiple scales that make up the AUI. In the second part of the study (Chang et al., 2001), offenders with distinctive AUI profiles (typologies) were initially identified through the use of cluster analysis, and these groupings were compared and contrasted with respect to demographic data, recidivism, and other driving outcomes.

METHODS

LCSP

Under contract with the Bernalillo County Metropolitan Court (the Court), the LCSP (Albuquerque, New Mexico), evaluated DWI offenders from April 1989 to September 1994 (Lapham et al., 1993). State laws did not mandate judges to refer offenders for screening at that time, but judges routinely sentenced first offenders to undergo assessment at LCSP for alcohol-related problems. The LCSP consisted of testing, interviewing, and monitoring. Clients were required to undergo standardized testing to identify the presence, nature, and intensity of alcohol- or drug-related problems and to participate in a structured personal interview with a master’s-degree-level counsellor. The counsellor reviewed and provided feedback test results with the client. The counsellor also determined the circumstances of the DWI arrest; asked about previous arrest history and the history of other violations; and obtained information about any legal, social, family, or medical problems resulting from or contributing to alcohol or drug misuse. The counsellor determined the severity of the client’s alcohol abuse and referred the client for treatment when indicated. A client’s progress in, and compliance with, treatment were also monitored. Details of the screening programme and testing procedures are available (Lapham et al., 1995).

DWI study sample

The study sample was drawn from 4993 people convicted of a DWI offence and referred to the LCSP for evaluation between April 1989 and March 1991, when the AUI was administered as a self-report screening instrument. Of these, 3677 completed the screening programme. However, 780 offenders were not administered the AUI due to protocol differences over time and lack of a Spanish version of the AUI; 873 were excluded because they were repeat offenders; 298 had no match of identifiers with traffic records (name, social security number, and birthday); 47 were non-residents of New Mexico; and 35 had incomplete identifier information. As a result of all of these factors, the study population consisted of 1644 DWI offenders. The mean age was 30.7 (SD: 9.9). Of this population, 720 (44%) were non-Hispanic White, 753 (46%) were Hispanic, 132 (8%) were Native American, and 39 (2%) belonged to the other racial/ethnic category. Seventy-five per cent of the population was male. Clients had an age distribution of 38% less than 26 years of age, 46% between 26 and 40 years of age, and the other 16% were 41 years of age and older. Almost half (46%) were single, 31% were married or living together as married, 21% were divorced or separated, and 1% were widowed. Eighty per cent of this population was employed.

AUI

The AUI measures multiple dimensions of an individual’s perceived benefits, styles, consequences, and concerns about drinking (Wanberg and Horn, 1987). The test consists of 228 questions. All questions are multiple choice and range from a negative response, such as no or never, through low-level responses, such as sometimes, to a high-level response, such as often. Individual raw score ranges vary, with some items ranging from 0 to 1, other items ranging from 0 to 2, and some items ranging from 0 to 5. Administration of the instrument and scoring by hand or by computer are described in the Guide to the Alcohol Use Inventory (Horn et al., 1990). The current version of the AUI comprises 17 primary scales, six second-order scales, and a third-order broad scale.

Of the 17 primary scales, SOCIALIM, MENTALIM, MANGMOOD, and MARICOPE measure perceived benefits from drinking. GREGARUS, COMPULSV, and SUSTAINED measure styles of drinking. LCONTROL, ROLEMALA, DELIRIUM, HANGOVER, and MARIPROB measure consequences of drinking. And, finally, QUANTITY, GUILTWOR, HELPBEFR, RECEPTIV, and AWARENES measure concerns about drinking. Following the same framework, at the second-order level, ENHANCED — drinking to enhance functioning — represents benefits associated with use of alcohol. OBSESSED — obsessive, compulsive, and sustained drinking — represents styles of drinking. DISRUPT1 and DISRUPT2
— uncontrolled life disruption — represent consequences of drinking. Finally, ANXCONCN and RECPAWAR — anxious concern and awareness — represent concerns and acknowledgment of drinking problems. The third-order scale ALCINVOL indicates an individual’s broad involvement with alcohol. Detailed description of the scales and the development of the instrument can be found in Wanberg et al. (1977), Wanberg and Horn (1987), and Horn et al. (1990).

**AUI normative sample and re-evaluation residential care sample**

Data from the AUI normative sample and a second re-evaluation residential care sample were used to compare with data from DWI offenders. Since responses to individual questions of the AUI were required for the principal component analysis and are not available for the normative sample, data from this re-evaluation residential care sample were also used for comparison to the DWI offender sample.

The normative sample included 1290 people who were first-time admissions to an in-patient alcoholism treatment programme in Denver, CO, USA, between 1975 and 1981. Most of the subjects came through the Alcoholism Division of the Fort Logan Mental Health Center. This sample is described in the AUI manual. The mean age was 38.16 years (SD: 11.89); 15% of the sample were female; 61% were Non-Hispanic White American; 21% Hispanic-American; 8% African-American; and about 4% were Native American and Asian American.

The re-evaluation residential care sample comprised of 788 admissions to public in-patient facilities tested between 1988 and 1992. Most were in-patient admissions to Veteran Administration Hospitals. The average age was 39.31 years (SD: 10.53) and mean years of education was 12.66 (SD: 4.30). About 95% of the sample were male, about 76% (n = 597) were non-Hispanic White, about 14% (n = 112) African-American, a little over 4% (n = 32) Hispanic, and over 3% (n = 27) Native American.

**Statistical analysis**

**Internal consistency reliabilities, squared multiple coefficients, and per cent unique variances.** Internal consistencies of the scales for the DWI sample were examined using the same approach as used by the developers of the AUI (Cronbach, 1951; Wanberg and Horn, 1987). The statistics used in this analysis were internal consistency reliabilities (ICRs), squared multiple coefficients (SMCs), and per cent unique variances (PUVs). ICRs measure the true score (reliable) variance found among the items in each scale. They indicate the extent to which the items of a scale are intercorrelated. SMC measures how well this reliable variance can be accounted for by other scales (a linear combination of other scales). SMC measures the degree of independence a scale has from all of the other scales combined. A PUV is the difference between an ICR and SMC, which, therefore, measures the proportion of internally consistent variance of a scale that is not held in common with the variance of the other scales.

**Principal component analysis.** Primary principal components and common factors were identified in the development of the AUI scales. The same analysis, the principal component analysis, was used on all AUI scales for the DWI sample. It was done on each scale to examine the loadings of the first principal components (FPCs) of each item. The FPC represents the linear combination of the items that provide the maximum variance within that scale. Of particular interest were those scales that had lower than desired ICRs (below 0.60), in order to examine which items may not contribute the desirable variance to the measurement of each scale. This method elucidates how DWI clients might differ from clinical samples with respect to the AUI scales. Along with the ICRs, the FPC indicates whether the DWI clients show less consistency in responding to certain items with each scale.

**Scale and profile comparisons.** Simple linear (correlational and ‘t’ tests) and categorical data analyses were used to generate profile comparisons. The DWI sample and the AUI normative group were compared using means, SDs and percentiles. Differences in scales between gender, race/ethnicity, age, marital status, education, and employment were compared by categorical analysis of the decile distributions. Categorical analysis was chosen because of the non-normality and multi-variate nature of the data. The main effects and two-term interactions of these variables were initially included in the model. Interactions that were tested to be non-significant were later removed. Due to the large number of tests being performed, the critical value was set at 0.01 to avoid multiple comparison problems.

**RESULTS**

**Internal consistency and independence**

Table 1 presents ICRs, SMCs, and PUVs of the scales for the DWI study sample and the AUI normative population. All ICRs for the study population were lower than those of the AUI normative population. For the AUI normative population, at the primary level, all scales but QUANTITY had ICRs of 0.67 or larger, and all scales but DELIRIUM had ICRs of 0.80 or smaller. (QUANTITY is a derived scale, not determined by Rector analysis and is expected to have a low ICR.) For the study population, at the primary scale level, all scales but SUSTAINED and QUANTITY had ICRs of 0.53 or larger, and all scales but MARIPROB had ICRs of 0.78 or smaller. The majority of the primaries (11 out of all 17) of scales stayed within a 10% difference, compared with the AUI normative sample. Six scales, however (MENTALIM, SUSTAIN, ROLEMALA, DELIRIUM, QUANTITY, and AWARENESS), had a larger decrease from the normative population statistics, ranging from a 14% to a 39% difference. MENTALIM had a 16% lower ICR, SUSTAINED had a 39% lower reliability, ROLEMALA and DELIRIUM also had lower ICRs (16% and 24%, respectively), and QUANTITY and AWARENESS had 23% and 20% lower ICRs, respectively. For the AUI normative population, at the second- and third-order levels, ICRs ranged between 0.74 and 0.93, compared with those of the study population (0.64 to 0.90), an average 7% decrease.

SMRs for the study population were also lower than those of the AUI normative population. Consistent with those of the AUI normative population, however, all SMRs remained lower than the ICRs, and all PUVs were larger than 10%.

**Internal structure of problem AUI scales for DWI sample**

Table 2 provides the first principal component of a principal components analysis of five primary scales (MENTALIM,
SUSTAIN D, ROLEMALA, DELIRIUM, and AWARENES) that had the greatest decrease in ICR values, compared with the AUI normative sample.

First, FPC loadings on MENTALIM for the D WI sample were somewhat lower than the re-evaluation sample, yet were still in the moderate-to-high positive range.

The consistency problems with the SUSTAIN D scale for DWI clients are quite apparent when looking at the FPC loadings. Item 9, ‘Drink several days, then sober up for a period before drinking again’ and item 46, ‘Drink mainly weekends, holidays or days off’, actually had negative loadings with the factor. Item 28, ‘Go on the wagon’, had a low, but positive loading. The remaining five items had moderate-to-high positive FPC loadings.

The problem items with ROLEMALA were item 49, ‘Have been detained or jailed for public drunkenness’, and item 87, ‘Have received a ticket for driving under the influence’. The remaining items had moderate-to-high positive FPC loadings.

The main problem item for DELIRIUM was item 12, ‘Fuzzy thinking as a result of being drunk’. All items in DELIRIUM had moderate-to-high FPC loading, except for 12.

With DWI clients, AWARENES had a lower-than-desired (0.59) and marginal ICR. Table 2, however, reveals that the FPC loadings were in the moderate to moderate-high range. For the re-evaluation sample, the FPC loadings were all in the high range (with an ICR of 0.85).

**Profiles for the DWI sample**

Profiles of the scales for the study sample and the AUI normative sample are presented in Fig. 1. Descriptive statistics including means, SDs, ranges, and percentile scores for these scales in the DWI and AUI normative samples are presented in Tables 3 and 4 for comparison. Figure 1 shows that GREGARUS is the only scale with a mean score comparable, though still significantly lower, to that of the normative population. All other mean scores for the study population were much lower than those of the AUI normative population. At the primary level, while 60% of DWI offenders had no endorsed items (a score of 0), for eight of the 17 scales (Table 3), more than 90% of the AUI clients endorsed items for 11 of the 17 scales (Table 4). In the DWI sample, 80% or more of offenders had a zero score for MENTALIM, COMPULSV, and HELPEFBR. For those scales where a majority of the offenders scored at least one point, the scores were low, compared with those of the AUI normative population. At the second- and third-order levels, the majority of offenders endorsed at least one item in each scale. Although the scale scores were still low, they indicated higher variance/sensitivity of the scales than the primary scales, compared to the normative population.

**Comparisons between gender and racial/ethnic groups**

Profiles by gender and racial/ethnic groups for the scales are presented in Figs 2 and 3 respectively. Gender comparisons
revealed only marginal differences in two scale scores, QUANTITY and DISRUP1, in which female offenders scored lower than males. Ethnic comparisons (Fig. 3) revealed that Native American offenders scored high, compared to non-Hispanic Whites for all but one of the primary scales (13 out of 17 were statistically significant), for all but one of the second-order scales (5 out of 6 were significant), and for the third-order scale. With a profile similar to that of the non-Hispanic Whites, Hispanic offenders scored lower than Native American offenders.

### DISCUSSION

Two major findings resulted from this study. First, on the average, as compared with the AUI normative and re-evaluation samples, the DWI sample generally exhibited lower internal-consistency reliability for the AUI primary and higher order scales. Second, and most noteworthy, for the DWI sample, raw-item and scale-score variances/sensitivities were significantly lower, particularly for the primary scales, which resulted...
### Table 3. AUI percentile scores, means, and standard deviations (SD) for the DWI sample

<table>
<thead>
<tr>
<th>Scale description</th>
<th>DWI first-offender clients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P0</td>
</tr>
<tr>
<td>Primary scales</td>
<td></td>
</tr>
<tr>
<td>SOCIALIM</td>
<td>0</td>
</tr>
<tr>
<td>MENTALIM</td>
<td>0</td>
</tr>
<tr>
<td>MANGMOOD</td>
<td>0</td>
</tr>
<tr>
<td>MARICOPE</td>
<td>0</td>
</tr>
<tr>
<td>GREGARUS</td>
<td>0</td>
</tr>
<tr>
<td>COMPULSV</td>
<td>0</td>
</tr>
<tr>
<td>SUSTAIND</td>
<td>0</td>
</tr>
<tr>
<td>LCONTROL</td>
<td>0</td>
</tr>
<tr>
<td>ROLEMALA</td>
<td>0</td>
</tr>
<tr>
<td>HANGOVER</td>
<td>0</td>
</tr>
<tr>
<td>MARIPROB</td>
<td>0</td>
</tr>
<tr>
<td>QUANTITY</td>
<td>0</td>
</tr>
<tr>
<td>GUILDWOR</td>
<td>0</td>
</tr>
<tr>
<td>HELPBEFR</td>
<td>0</td>
</tr>
<tr>
<td>RECEPTIV</td>
<td>0</td>
</tr>
<tr>
<td>AWARENESS</td>
<td>0</td>
</tr>
<tr>
<td>Secondary scales</td>
<td></td>
</tr>
<tr>
<td>ENHANCED</td>
<td>0</td>
</tr>
<tr>
<td>OBSESSED</td>
<td>0</td>
</tr>
<tr>
<td>DISRUP1</td>
<td>0</td>
</tr>
<tr>
<td>DISRUP2</td>
<td>0</td>
</tr>
<tr>
<td>ANXCONCN</td>
<td>0</td>
</tr>
<tr>
<td>RECPAWAR</td>
<td>2</td>
</tr>
<tr>
<td>Broad (tertiary)</td>
<td></td>
</tr>
<tr>
<td>ALCINVOL</td>
<td>0</td>
</tr>
</tbody>
</table>

*a. Based on raw score distribution and AUI profile in the AUI manual (p. 12); b. All ‘t’ values significant at 0.01 level for two-tailed test when compared with the DWI sample (Table 3).*
in low-bound profiles for a large proportion of DWI clients. These major findings, as well as other important findings, are discussed below.

**Lower internal consistency reliability**

In a general sense, the DWI sample’s lower internal consistency reliability indicates that the associations among the items within each scale are not as strong as they are within the two clinical samples. This finding was expected in that the constructs and items measuring those constructs in the AUI were developed to measure alcoholic conditions and patterns that are prevalent among clients in a clinical — and not a DWI — setting. For some questions, DWI clients do not identify with or perceive the meaning of the questions in the same manner that clinical clients do, which may affect how they perceive or characterize certain behaviours or symptoms, which in turn affects the AUI’s measurement of those patterns.

This lower internal consistency reliability may be caused in part by demographic differences between the DWI and clinical samples. In general, compared with the general population, DWI offenders tend to be young (Vingilis, 1983) and not currently or previously married (Bell et al., 1978). In the present study too, the DWI offenders were in fact significantly younger, and a greater proportion was single, compared with the normative sample of alcoholics in treatment. Close to 40% of offenders were 25 years old or younger, and 45% of them were single (Chang et al., 1996).

Other differences between this study’s DWI population and the AUI normative populations should be noted. First, it is important to remember that the DWI sample was restricted to only those who: (1) had completed the AUI; (2) were ordered by the Court to participate in the screening programme, (3) completed the personal interviews. Thus, we cannot know the characteristics as measured by the AUI for those not referred by the Court for evaluation or for those who were referred but did not comply with or did not complete the screening programme. To this extent, the sample of DWI offenders is biased. These clients, whose screening was court-mandated, would have motivations different from the client population used to norm the AUI, i.e. who completed the AUI as part of a voluntary treatment programme. Second, unlike the AUI normative population, many DWI offenders in this sample have not sought treatment services and do not acknowledge problems from their use of alcohol. Even so, although these offenders are younger than the normative population and have a shorter drinking history, they did exhibit patterns of alcohol abuse. In fact, as determined by a follow-up study conducted in this population 5 years after their initial DWI screening evaluation, 45% of the male and 40% of the female offenders met DSM-III-R criteria for alcohol dependence (Lapham et al., 1998a).

However, the effects of these differences are mitigated by the size of this study sample. In addition, replicating this study across several other DWI evaluation samples would certainly help to address these differences more fully.

There were some differences, however, that were quite substantial. Although most of the primary and second-order scales did not pose a problem, three scales — MENTAL, SUSTAIND, and ROLEMALA — had low reliability (below 0.60) and showed substantial difference between the DWI study sample and the AUI normative sample (above 10%).

**MENTAL scale**: Although the ICR for MENTAL falls below the desired limit for use in clinical interpretation, a clear positive-manifold was found among the FPC loadings, and they were in the moderate to high-moderate range. The lower ICR is in part due to the narrow measurement of the scale: only five items are used to measure the construct. Furthermore, DWI clients and clinical clients differ in the way they respond...
to questions about the relationship between drinking and mental functioning. DWI clients tend to perceive little, if any, relationship between drinking and mental function, whereas clinical clients tend to believe that drinking enhances mental functioning.

**SUSTAINd scale:** The internal consistency problem with the SUSTAINd scale is apparent focusing on three questions: 9, 28, and 46, as shown in Table 2. The FPC loadings were low for the alcoholic sample and further problematic for the DWI sample. These questions may already have been ambiguous for the alcoholic client and, to a greater degree, for the DWI client. Perhaps DWI clients’ drinking patterns were more divergent, erratic, or inconsistent and could not be characterized by these questions. These differences, however, merit further study.

A study reporting on the revised AUI scales has used the enhanced items in the AUI that measure both periodic and sustained drinking (Wanberg et al., 1999). A factor analysis of these items indicates two separate factors with ICR values in the acceptable to optimal range for DWI samples.

**ROLEMALA scale:** The ROLEMALA scale was marginal with respect to internal consistency. The major problem items in this scale were ‘receiving a ticket for drunken driving’ and ‘detained or jailed for public drunkenness’. This indicates that DWI clients do not necessarily perceive that a DWI citation indicates a deficiency in social-role responsibility. This is certainly compatible with clinical observation, which has shown that most DWI clients fulfill expected social responsibilities, such as holding a job, being in marital relationships etc. Generally, DWI clients do not perceive that drinking interferes with their job or their relationships, or causes them to live alone or to have marital problems.

**General remarks on the lower ICRs.** The question, then, is whether the lower ICRs for the DWI sample could indicate that DWI clients are less consistent in their responding to self-report tests for the other AUI scales. However, study findings indicate that they are in fact not less consistent. Nine of the 17 primary scales had ICR values in the optimal range (0.68 to 0.80). If DWI clients are responding inconsistently across the board, then this inconsistency should be reflected in all scales, which was not the case. Several of the primary scales have high ICR values, including MANGMOOD, which has an ICR value of 0.77. We conclude, therefore, that the most plausible explanation for the differences found in ICR values involves the inherent differences between DWI samples and clinical samples.

Finally, it should be noted that lower internal consistency measures among non-clinical samples will be addressed somewhat in subsequent versions of the AUI (Wanberg et al., 1999). Questions not scored in the current version of AUI will be included in the scoring programme for the next version in order to enhance the measurement depth and breadth of the AUI scales for DWI clients. Preliminary results of these revised scales for DWI samples are favourable.

**Lower raw item and scale score variances/sensitivities**

The issue of overall low scale score variances/sensitivities in the DWI sample is probably more problematic than the issue of lower scale reliabilities. It is not clear whether and to what extent the lower scores represent under-reporting, defensiveness, and resistance to self-disclosure. Given the nature of the DWI referral and the circumstances of testing, we feel safe in assuming that the low-bound profiles are due, at least in part, to defensiveness in approaching self-attitude questions. This in turn assumes that DWI clients have a higher level of defensiveness than clients in clinical samples or clients who refer themselves to treatment, an assumption supported by findings that DWI offenders undergoing screening under-report their criminal histories (Chang and Lapham, 1996).

Certainly, evaluators must be aware of this tendency to under-report. However, we suggest that they should not be quick to interpret low-bound DWI AUI profiles in clinical terms, that is, as proof of ‘lying’ or ‘denial’. Instead, these profiles represent clients’ best ability at the time of assessment to provide information about themselves, given all of the perceived threats and concerns they face about self-disclosure. Understanding this will provide the evaluator a basis upon which to build trust and rapport with clients and to develop techniques to change the client’s defensive posture.

The question remains, however, how these lower scoring profiles should be interpreted — How can the AUI best be used to interpret DWI profiles? We suggest four possible remedial measures. First, the use of second-order scales may be more helpful to the evaluator, particularly with profiles with lower-bound scores. When the second-order scales approach the low-medium to medium percentile score ranges (above decile scores of two), then the primary scales will take on more meaning and will provide more reliable variance/sensitivity in making clinical interpretations. Low-bound profiles should be evaluated on an individual basis.

Second, because of the potential defensiveness of DWI clients, because AUI items and scales have high transparency, and because the current version of the AUI does not have a ‘truthfulness’ scale *per se*, we recommend that AUI self-report results be used alongside other information: (1) a face-to-face interview should be conducted and (2) collateral data should be collected. The interview is important, because it enables the evaluators to develop a rapport with the client and because the interview itself can reduce the discrepancy between the client’s and counsellor’s perceptions of need for alcohol treatment. Collateral data can help determine whether under-reporting is a contributing factor to low scale scores for an individual client. Furthermore, these collateral data can include external indicators of validity, such as offenders’ self-reported vs court-reported criminal/traffic records. Significant others could be interviewed to get another viewpoint about the client’s drinking habits and consequences. The client’s self-reported amount of alcohol consumed and timing of the events leading to arrest can be compared with the blood-alcohol content at arrest. Third, evaluators should carefully examine both optical scanner or hand scoring answer sheets before they are scored, in order to reduce the possibility of inconsistent responses due to inattention and dissimulation. Attention should be given to answer patterns such as the Z-shaped pattern, choosing all ‘no’ or all ‘yes’ answers, much erasing, and many unanswered questions.

Finally, when used in a DWI screening context, cut-off points signalling alcohol abuse and dependent patterns should generally be lower than for the normative population. For example, for a clinical population, a raw score of 9 to 10 on the
DISRUPTI scale indicates that the client is falling into or at least approaching an alcohol abuse pattern; we suggest that for a DWI-offender population, the cut-off point should be lowered by two or three raw data points. The revised AUI will provide distributions for DWI samples, and this will further assist the evaluator in interpreting the meaning of AUI raw scores.

Other findings

Other important findings concern gender and ethnic differences in AUI profiles. Male and female DWI offenders had very similar profiles, which contradicts the findings of previous studies. Horn et al. (1990), whose data came from the 1960s and 1970s, found that female alcoholic patients were more likely than males to use alcohol to ward off depression, to deal with anxiety and, in general, to change mood. Horn et al. (1990) also found that these women were more likely than men to blame their marital difficulties on their drinking. Conversely, the present study found that female DWI clients reported drinking as much for social, as avoidance, issues. Since these offenders are more likely to be single than the AUI normative population, this finding is not surprising, but the difference can also be traced to changing social norms for men and women in society. As Horn et al. (1990) and others (Waller and Blow, 1995) have pointed out, women have entered the workforce in increasing numbers and attend social gatherings where drinking is accepted. Women also drink more alcohol and drive more miles, thus placing themselves at increasing risk for drinking and driving offenses. All of these factors would tend to blur the distinction between ‘male type’ and ‘female type’ drinking patterns.

With respect to ethnicity in the AUI normative sample, urban Native Americans had the highest AUI scale scores, followed by Hispanics, Blacks, and non-Hispanic Whites. Non-Hispanic White alcoholics had the least severe drinking pattern in the clinical sample. In the present study too, Native American DWI offenders scored high for almost all scales of AUI, when compared with non-Hispanic White and Hispanic offenders, and Native Americans displayed the heaviest drinking pattern and most disruptive life style due to alcohol use, findings that are consistent with reports of other investigators (Wanberg et al., 1978).

However, Hispanic offenders in this study had a profile similar to the non-Hispanic Whites, a finding that directly contradicts that of Horn et al. (1990). It could be that Hispanics showed higher AUI scale scores in the clinical population because Hispanics tend to underuse mental health and substance abuse-related services (Bergin and Garfield, 1994). That is, those Hispanics who become members of a clinical population represent a more extreme portion of the substance-abusing Hispanic population, than do those Hispanics who have become members of the criminal justice population. Also, compared to the general populations, Hispanics are overrepresented in the DWI population (Chang et al., 1996). If they are arrested at higher rates than non-Hispanic Whites, this may explain a lower severity in arrested Hispanics, compared with non-Hispanic Whites. The issue of a lower threshold among police for arresting members of minority populations has been raised or implied by investigators (R. Caetano and C. L. Clark, unpublished; Lapham et al., 1998b), but conclusive evidence is lacking.

Final remarks

In summary, lower reliabilities and scale score variances/sensitivities were found in the DWI sample, when compared with the AUI normative sample and a re-evaluation clinical sample. Low reliabilities were attributed to certain individual items within three primary scales: MENTALIM, SUSTAIN, and ROLEMALA. Lower scale score variances/sensitivities were across the board for all primary and higher order scales. The higher order scales were more reliable than the primary scales, and there was greater variance or measurement sensitivity in the higher order scales. Therefore, evaluators may want to emphasize the higher order scales for clinical interpretation, particularly for profiles with scores in the first and second decile ranges. DWI clients respond with lower item association and consistency within certain AUI scales. Because of the face validity of the AUI items and the potential defensiveness of DWI clients, it is critical that evaluators use data from face-to-face interviews and collateral data when making treatment disposition decisions. It may be appropriate to use lower cut-off points for determining alcohol abuse and dependent drinking patterns. Evaluators should use other indicators, such as offenders’ court criminal/traffic records and blood-alcohol levels, to help identify those who are more likely to be highly defensive and under-report their involvement with alcohol. Evaluators should also be aware of these issues and consider the use of the revised AUI, when available. Typologies as well as risk factors reported in the second study of this series (Chang et al., 2001) may be useful to identify problem drinkers in this population. Finally, because male and female offenders show the same levels of alcohol involvement, interviewers should not assume that female offenders have fewer alcohol-related problems than their male counterparts. Native American offenders had the highest levels of heavy drinking and life disruption.

Acknowledgements — The authors would like to thank to Bernalillo County Metropolitan Court Judges for their support of the LCSP, LCSP counsellors and project associates for their efforts in collecting data and record keeping, and Ms Joyce Welt for word processing support. This research was supported by the National Institute on Alcohol Abuse and Alcoholism, Grant #R01 AA09620.

REFERENCES

Behavior Data Systems, Ltd. Alabama DRI-II Orientation and Training Manual. P.O. Box 44256, Phoenix, AZ.


