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COURT PROCEDURES FOR IDENTIFYING PROBLEM DRINKERS

Report on Phase I

The University of Michigan
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16. Abstract This report describes the development of a procedure to identify the problem drinker within a court setting. An extensive literature search was undertaken to obtain tests and test-items which would discriminate the problem drinker from the social drinker. A self-administered Questionnaire and a face-to-face Interview were developed using these items and then administered to 297 control subjects and 192 problem drinkers. The answers were statistically analyzed for ability of the item to discriminate between the two groups. All items which did not strongly discriminate were eliminated. The final Questionnaire consisted of 54 items and the Interview of 52 items. Double cross-validation was used to establish the concurrent validity of the Questionnaire and Interview. These validity coefficients were 0.849 and 0.917, respectively. A scoring procedure was developed to classify persons into one of three categories based on Questionnaire and Interview scores, as follows: problem drinker, presumptive problem drinker, nonproblem drinker. Examination of the driving records of the control and alcoholic samples showed that the alcoholics had significantly more violations and accidents. Therefore, such data can also be used to supplement the test scores in reaching a diagnosis in persons scoring in the presumptive problem drinker category. A Manual was then developed for use by a court counselor which explains how to use the procedure, what related information to obtain, directions for scoring, and suggested general treatment possibilities. The Manual was tested on a small sample of persons convicted of DUIL, DWI and D & D offenses.

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SUMMARY OF WORK COMPLETED AND OBJECTIVES

This report describes the activities and findings of Phase I of the project. The work involved an extensive updating of the reviewed literature, the additions of pertinent new material, the development and validation of a Questionnaire and Interview protocol whose objective is to aid the court presentence investigator to identify problem drinkers, and the composition of a Manual for use by the court personnel which describes the technique and its background.

In Phase II the Manual was screened by a number of experts, revised as necessary, and then put to use in traffic courts to evaluate its practicality and effectiveness.

The Manual itself is not described in this report. It is provided in separate reports under this project and is in three volumes.

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Mr. C. Rosenblatt and Dr. Barbara Mudge were responsible for some sections of the literature review, development of items for the Interview, and data collection. The material concerned with the medical etiology and medical diagnosis of alcoholism was prepared by Dr. Mudge.

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INTRODUCTION

OBJECTIVE

There are numerous reports concerning the relationship of alcohol to traffic crashes, poor driving performance and crime. Forty-three percent of all the traffic fatalities in one study involved drivers who were drinking to a blood alcohol concentration (BAC) of 0.15 percent and above (Filkins et al., 1970); drinking-driving offenders often have prior traffic arrest records (Waller, 1967); and in most courts, drinking-related offenses constitute a great proportion of the court docket (Plaut, 1967).

Recidivism rates are high among drinking offenders (Pittman, 1965) which indicates that the traditional legal sanctions alone (fine or jail) are not adequate deterrents. It has also been shown that a disproportionate number of these offenders are problem drinkers (Goldberg, 1955).

There has been a steadily growing awareness of the need to develop improved means by which to handle the problem-drinking driver, and numerous pilot programs are now under way to evaluate the effectiveness of various approaches. The efforts could fall into a number of major categories such as: restricted licenses for problem drinkers; vehicle alcohol ignition interlocks to prevent use of the vehicle when the driver is impaired; improvements in detection of the impaired driver on the road by the police; more thorough and prompt legal handling of drinking-driving cases by the courts; identification and recognition by the court of the problem-drinking driver; and appropriate assignment to and treatment for the rehabilitation of the drinking driver.

This study deals with identification of the problem-drinking driver and is intended to help bridge the gap between the use of traditional legal sanctions and driver rehabilitation.

In order to permit the courts to become more effectively involved in rehabilitating the problem-drinking driver, it is first necessary to devise a means by which the problem drinker can be identified. Therefore, the research described here has endeavored to develop such a procedure for handling drinking offenders who come through the courts. This procedure broadly attempts to identify the offender's typical drinking behavior; problem areas in his life; typical driving behavior; and his concept of himself. It more specifically attempts to identify the offender who has a long- or short-term drinking problem. This information will help to determine what type of rehabilitative approach will be most effective in preventing a repetition of the events which led to arrest, with the broad aim of further reducing the occurrence of severe traffic crashes and fatalities.

The procedure has initially been developed to be used by court personnel during a presentence investigation, but it may eventually be useful in other contexts, to social workers, public health officials and others dealing with problem drinkers, who may also use it as a diagnostic aid.

OVERVIEW OF PROCEDURES

The following methods were utilized in developing the procedure:

(1) An extensive literature search was undertaken which was an update of a previous survey (HSRI, 1969) dealing with characteristics of problem drinkers, and sought out psychological tests and test items which could validly distinguish the problem drinker from a social drinker.

(2) Using this information, a Questionnaire and Interview were developed. The Questionnaire was developed for use as an objective, brief, easily administered written test. It built upon previous work (HSRI, 1969) and is partly an extension of the Questionnaire reported by Mortimer and Lower (1970).

An oral Interview was developed for use with the Questionnaire. A need for personal contact with the individual offender was seen as an essential element in the diagnostic and therapeutic approach. An interview allows in-depth probing for the purpose of clarifying client responses.

It is important to note that these two methods are intended to be used together. Paradoxically, just as it is necessary to have an objective test to guard against biased attitudes by an interviewer, it is useful to include a subjective appraisal by someone who will be sensitive to the needs of the offender and perhaps a person already experienced in diagnosing such problems.

(3) After these two instruments were developed, testing was begun by administering them to problem drinkers, including alcoholic samples, and to nonalcoholic controls.

(4) Driving records were collected on both controls and problem drinking samples. No attempt was made to collect other information, e.g. social agency records, because of the time-consuming nature of the task.

(5) Statistical analyses were made of the Interview and Questionnaire data to determine indices of reliability and validity. Following item analysis, scoring keys were developed, and the scores of individual subjects were computed. These data were analyzed to determine the discriminative efficiency of the technique, and the final format and content for the Questionnaire and Interview were determined.

(6) A Manual was then developed which incorporated all of the parts of the procedure in a package considered to make it suitable for use by a presentence investigator in the court system.

METHODS

LITERATURE REVIEW

A literature review was undertaken as an update of a previous

search. The purpose of the review and the update was to assess personal background information, tests, and test items which discriminate between alcoholics and social drinkers. In the initial review, information was also collected on normal, nonalcoholic samples. Several of those studies dealt with sensory, perceptual and motor skills and the effects of alcohol upon these skills. The update does not contain this kind of category because it is not directly relevant to this study.

Topics were developed and a decision was made to limit the search, but not necessarily the discussion, to the years 1968-1970 since the previous review covered literature written before 1968. A set of relevant topics were selected. Index Medicus, Psychological Abstracts, Medlars and Classified Abstract Archive of the Alcohol Literature (CAAL) were used as main sources for titles. These titles were further screened and articles were requested and obtained. The written reviews are not detailed abstracts of the articles. Only the section of the article containing findings directly pertinent to developing either the Questionnaire, oral Interview, or Manual was described, along with author, date, subjects used, and related information on any analyses of the items which were performed.

Subject areas included previous recorded history data; medical diagnoses which would be indicative of early stages of alcoholism; self report information; and interview techniques.

PREVIOUS RECORDED HISTORY. This section of the literature review considers the predictive capability of information dealing with blood alcohol concentration (BAC) at the time of arrest as well as arrest history and driving violations of DUIL offenders or others who manifest a history of high alcohol intake. Also under consideration is the advisability of obtaining this and other information for use in the final diagnosis by the presentence investigator, or eventually by workers in public health and related fields.

BAC and Drinking-Driving History. The following exposition discusses the DUIL offender as an aberrant drinking driver. With one exception, it deals with control populations of drivers who were stopped at accident sites. Therefore, any conclusion that the DUIL offender is an aberrant drinking driver can only be tentative, since these are not random selections from the total driving population. The information was originally used to compare the BACs of control drivers and accident drivers. It is cited in this review because BACs were obtained from the control populations. The information consistently reveals that the samples of drivers who were stopped contained a large proportion of nondrinkers and only a relatively small percentage of drivers who ever reached a Blood Alcohol Concentration (BAC) of 0.15% W/V (150mg%)* or above.

The information concerning the accident victims in these studies is omitted since it is not relevant to the assumption being made. However, the conclusion made by the studies was that a high percentage of drivers responsible for accidents had BACs of 0.15% and above.

Holcomb (1938) sampled the BAC of 1,750 people in the general driving population. He found that 99.6% of the controls never reached a BAC of 0.15% and 98% never reached a BAC of 0.10%.

Lucas et al. (1953) found that 98.6% of 2,015 control drivers never reached a BAC of 0.15% and 96.7% never had a BAC above 0.10%.

In a study of the BAC of fatal accident drivers compared to a control population McCarrol and Haddon (1962) found that of 258 controls, 96% never reached a BAC above 0.10%.

Borkenstein et al. (1964), in an attempt to relate driver

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*Blood alcohol concentrations in percent weight by volume will hereafter be referred to by the decimal portion only; e.g. "0.15%" will indicate 0.15% W/V.

characteristics to driving behavior in actual traffic also compared a known accident population with controls. Of 7,590 controls, 99.8% of the drivers never reached a BAC of 0.15%.

In Vamosi's (1961) study 99.3% of the controls never reached a level of 0.15% and 98.1% never reached a BAC of 0.10%.

The above studies indicated that at the outside, 4.0% of the randomly sampled drivers had BACs above 0.10% (1 in every 25 drivers) and 1.4% of the drivers had BACs above 0.15%, or one in every 71 drivers. This suggests that the DUIL offender arrested with a BAC of 0.15% is an aberrant drinking driver in that he reaches a BAC much higher than that found in other segments of the drinking-driving population.

High BAC may be rare in social drinking situations. Birrel (1965) measured the BAC of drunk drivers, drunk and disorderly offenders and social drinkers in Australia. Birrel does not give the precise number of people involved in the social drinking situation except to say "...in some hundreds of breath analyses in various social situations, such as 'counter-lunches', paynight drinks, cocktail parties, after-work drinks and steak and burgundy lunches, I have met only three blood alcohol levels above 0.20%..." The "majority" of social drinkers had BACs below 0.08%, while the mean BAC for 250 drunk and disorderly subjects was 0.20% and for 1,115 arrested drunk drivers it was 0.22%. Some caution should be used in extrapolating the above information from Australian to United States drinkers since drinking habits may vary somewhat between the two countries. However, it is unknown if similar research, using measurements in varying social situations, has been carried out in the United States.

High BAC in Relation to Alcohol Abuse. Some experts feel there is a direct correlation between high BAC and problem drinking.

Smart and Schmidt (1967) compared the drinking histories of drivers involved in accidents. According to their findings (using hospital, clinic and criminal record checks) excessive drinkers were three times as prevalent among drivers in alcohol-related accidents as among those in nonalcoholic-related accidents. In the alcohol-related accidents, the mean BAC of drivers who were not problem drinkers was 0.07%. The mean BAC was 0.13% for problem drinkers and 0.15% for the alcoholics.

Twenty-five drivers killed in traffic accidents (DKT) and 25 randomly selected matched controls were compared by Brown et al. (1968). Personality disorders were diagnosed in 19 of the DKT and two controls ($p<.01$). Fifteen of the above 19 were alcoholics. Thirteen of the 15 alcoholics had BACs above 0.15%. Eleven of the alcoholic DKTs, but only two controls, had four or more previous traffic convictions ($p<.01$). Two alcoholics and no controls had previous DUILs.

Bjerver, Goldberg and Linde (1953) compared 71 traffic accident victims who came to a Swedish surgical outpatient clinic. They determined who were known alcohol abusers by obtaining records on file at the Central Liquor Control Board of Sweden. BACs of 0.15%-0.30% were found 45 times as often among alcohol abusers as among moderate drinkers.

Selzer and Weiss (1966) studied the responsible drivers in 72 fatalities. Of the 32 drivers whose BACs were known, 18 drivers had BACs between 0.15% -0.46% and 17 of the 18 were alcoholics--based upon information gathered from close relatives or the drivers themselves.

Thelin (1948) studied the driving patterns of drinking drivers whose BACs ranged up to 0.20%. He concluded that levels above 0.20% were principally encountered in chronic alcoholics.

Smith (1970) randomly sampled one hundred persons arrested

for DUIL in three counties of Michigan. The DUILs were interviewed using a questionnaire; and criminal, driving and state hospital records were reviewed. The DUILs were then classified into two categories: problem-oriented drinkers and temporary problem drinkers. The classifications were based upon a history of medical or social drinking problems or no previous history other than the arrest incident, respectively.

Results indicated that 74% of the DUILs demonstrated multiple symptoms of problem-oriented drinking. Forty-two percent of the DUILs with BAC between 0.09%-0.14% were classified as problem-oriented drinkers. Actually, none of the problem drinkers were below 0.12%. Eighty-two percent of those with BAC of 0.15%-0.20% and 69% of those with BAC between 0.21%-0.26% were classified as problem-oriented drinkers. All persons with BAC above 0.26% were in this drinking category.

As BAC reached higher levels so did the number of previous drunk and disorderly convictions. Smith also noted that temporary problem drinkers and problem-oriented drinkers were not significantly associated with any age group.

Alcoholism and Past Driving History. The possibility that the DUIL offender is a problem drinker can also be illustrated by reviewing the previous offense records of alcoholic populations. Obviously this does not presume that every DUIL offender is or becomes an alcoholic or that every alcoholic has a DUIL conviction in his past history, but according to several authors, the correlation is strong enough to indicate that a DUIL conviction is or can be used as a "red flag."

In a study of the driving, criminal, and hospital history of 1,247 hospitalized alcoholics, (Filkins et al., 1970) 16% of the alcoholic drivers had previous DUIL convictions on their driving record. However, there was an under-reporting of certain types

of driving events on the driving records and information on 39% of the alcoholics who had previous DUIL offenses was found only on the criminal record and not on the driving record. If the two groups were combined, the percentage of the alcoholic drivers with previous DUIL offenses would increase to 27%.

Twenty-five percent of the alcoholic population of drivers had no crashes or convictions over the six and one-half year period. Forty-four and five-tenths percent of a random sample of Michigan drivers had no previous crashes and convictions for the same period.

Selzer, Payne, Westervelt and Quinn (1967) studied 50 alcoholic male drivers (alcoholism was defined as an uncontrollable craving for liquor) who were admitted to a VA Readjustment Center, and a control group consisting of 50 emotionally ill, non-alcoholic male veterans admitted to the same facility. They found that the 50 alcoholics were responsible for approximately twice the accidents and violations of the nonalcoholic controls.

Eelkema et al. (1970) compared traffic violations and accidents of 238 patients discharged from a state hospital. Male alcoholics represented nearly half (49%) of the experimental subjects. There were also 290 comparison subjects chosen at random. The violation rates per hundred driver years between alcoholics and the matched comparison group showed that prior to entering a hospital, alcoholics had a violation rate of 23.9 versus 11.8 for the controls. They were also more likely to have DUIL convictions than controls. Alcoholics had repeated (2nd, 3rd, and 4th DUIL) offenses even in the face of severe legal sanctions.

Crancer and Quiring (1969) studied driver record files of 140 chronic alcoholics who were currently licensed and compared them to 687,228 currently licensed drivers of the same age and sex distribution living in the same driving environment. Acci-

dent and violation rates were statistically higher ($p<.05$) for the alcoholics than for the comparison group. They also had a larger proportion of violations for drunken driving (7.6 times greater); reckless, (4.1 times); hit and run (7.2 times); driving while suspended (1.8 times); and negligent driving (2.6 times). Interestingly, the chronic alcoholics were significantly under-represented on the records for speeding, failure to stop or yield, and defective equipment. The proportion of injury accidents for this group was also greater than for the controls.

According to Schmidt and Smart (1959), who also compared driving records of alcoholics with a control group, alcoholics had significantly more accidents ($p<.01$) per capita in the period under study than the general driving population. The clinic alcoholics had significantly more (approximately 9 times as many) convictions per capita per annum for drunken and impaired driving than the general driving population.

Past Social Adjustment of DUIL Offenders. According to a review of the literature, the DUIL population (as a group) gave indications by their past social histories that they have an inability to cope with many aspects of their lives.

Pollack (1969) attempted to identify applicants for a driving license who are likely to become convicted drunken drivers and recidivists. He studied 800 convicted drunk drivers and 1,400 license applicants.

He discovered that "persons convicted of drunk driving tend to have more problems as a result of their drinking: alcohol seems to upset their spouses, affect their budget, interfere with their jobs and accompany crimes more often than for persons never convicted of drunk driving."

For example, a comparison of drivers with 1-3 DUIL offenses

and a group of drivers applying for license renewal (DMV) revealed that 41%-68% of the first to third time DUILs, respectively, had previous, less serious criminal records as compared to 7% of the DMVs. Thirty-seven percent of first offense DUILs had a previous alcohol-related arrest as compared to 3% of the DMV sample. Seventy one to 86% of the first to third time DUIL offenders, respectively, had at least one minor traffic violation for the prior three years compared to 51% of the DMVs. Twenty-five percent of the first offense DUILs had major traffic infractions versus 0.7% of the DMVs. Fifty-seven percent of the third offense DUILs had major prior traffic offenses.

Filkins et al. (1970), in a driver comparison study of a random selection of Michigan drivers, DUILs, traffic fatalities, and hospitalized alcoholics, found that DUIL offenders had an appreciably higher percentage of driving convictions, DUIL/DWI and reckless convictions. Four times as many DUILs had two or more accidents as the random selection of Michigan drivers.

6.5 yr. Previous Driving History	DUILs N=169	Michigan Drivers N=1070
4 or more driving convictions	58%	12%
1 or more DUIL/DWI	12%	<1%
1 or more reckless	14%	3%
2 or more accidents	31%	8%

Waller (1967) compared the criminal, driving, and social service records of DUILs, a random sample of drivers with no violations, and several other populations in California. His results indicate that 84% of the 150 DUILs had an average of 4.6 previous alcohol-related arrests per person as compared with 0.2 previous arrests in the group without violations.

There were 6.5% previous arrests for any reason per person in the DUIL population versus 0.4% of those with no infractions.

Eighty-one percent of the DUILs had previous contact with community agencies, e.g. welfare or probation departments, state mental hospitals, alcoholism clinics, or family service organizations. Only 10% of the drivers without violations had such contact.

Twenty-nine and four-tenths percent of the DUILs had known alcohol problems as compared with 0.7% of the no infraction group.

Goldberg (1955) analyzed background history of DUIL offenders in Sweden and found that 58% of the DUILs had previous traffic convictions as compared to an average of 13% of the general population. Twenty-four percent had prior criminal offenses as compared to 4.6% of the general population.

Of the Swedish DUILs, 45.4% were alcoholic addicts, alcohol abusers, or excessive drinkers as defined by previous records of high alcoholic intake and offenses of drunkenness, as compared to 8.8% in the total Swedish population.

In a similar study, Coldwell and Grant (1962) examined the characteristics and background of Canadian drivers arrested on suspicion of driving under the influence of liquor (50% of whom had been arrested after involvement in a collision). Twenty-three percent had previous criminal offenses; 74% of these were for impaired driving or DUIL and 26% for other criminal offenses. About 6% of male Canadians over 16 years of age had such records.

Selzer (1963) studied the DUIL offenders in terms of the numbers with alcoholism or mental illness. He diagnosed 78% of the DUILs as alcoholics, probable alcoholics, or prealcoholics and 67% as having psychiatric illnesses apart from alcoholism.

Regardless of previous history, one DUIL arrest or conviction alone is a rare event for a normal driving population. In a

study of 1,071 randomly selected Michigan drivers (Little, 1968), more than 99% never were arrested for DUIL or impaired driving in a six-year period. This makes even a first time DUIL offender a unique drinking driver.

Kaestner, Howard and Warmoth (1969) surveyed 720 male residents of Oregon who were convicted of DUIL between September and November, 1968. Areas surveyed were: (1) the circumstances surrounding the arrest; (2) personal case history data; (3) the consequences of the arrest; and (4) the interrelationships of all these factors.

The results revealed that the average BAC of the DUILs was 0.21%. Three in ten arrests involved a collision. DUILs had significantly more prior accidents on their record and nearly three times as many prior traffic citations.

One in seven had a previous DUIL conviction and one in four had a past criminal record. Three in eight had a previous charge for drunkenness in public not associated with driving. Drivers who had two or more DUIL convictions generally had poorer prior driving records, more extensive past drinking records, and worse past criminal records.

In summary, a high BAC and/or a previous traffic and criminal record of alcohol-related offenses tends to indicate a history of alcohol misuse. The next issue concerns the accessibility and accuracy of these records and related records.

Record Acquisition Accuracy and Interpretation. BAC, driving, and criminal records appear to be useful diagnostic tools. Other items which could be useful are previous contacts at alcoholism or mental health clinics; admissions to hospitals and the reasons; contact with the welfare or social services departments, or family aid clinics. Some problems may arise in trying to obtain information and there are indications of gross under reporting on numerous types of records.

Of all of the records that can be obtained relating to the history of the DUIL offender, the BAC reading from a Breathalyzer* test is probably the single most reliable piece of information. It generally is quite an accurate estimate of drinking involvement and, as has been discussed, at certain levels could be indicative of problem drinking.

However, one factor, the Implied Consent statute, might place limitations on its usefulness. A high percentage of persons arrested for driving under the influence of liquor will subsequently refuse to take the BAC test**(Michigan Driver Facts, 1969). Therefore, this piece of information may not be available to the presentence investigator.

As to the results of BAC testing, any reading above 0.25% would be evidence of problem drinking and its intensity (Smith, 1970). According to Goldberg (1950) "an occasional drinker cannot, without forcing, imbibe large amounts of alcohol; if he does it, he generally reacts by vomiting due to pylorospasm." (This reaction by moderate drinkers to overdrinking has more recently been documented by Mendelson (1966).

Goldberg further noted that under test conditions occasional drinkers (once or twice a year drinkers) could reach a maximum BAC of 0.03% while moderate drinkers could reach a BAC of 0.06%--far below the level reached by a DUIL offender.

Though it is assumed that driving and criminal record information is fairly reliable, even this should be approached with caution. Zylman and Bacon (1968) explored the meaningfulness and validity of available police records on alcohol involvement in road traffic accidents in 16 towns and cities. A lack of uniformity in definition of a reportable accident, or alcohol-related

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*Registered TM of the Stephenson Corporation, Red Bank, N.J.

**In the State of Michigan, 1969, 22% of persons arrested refused to take the test.

accident, was observed. Local procedures frequently determined whether cases would be excluded or included in local records and in subsequent reporting to state and national agencies and there was an incompatability in data gathering.

Kaestner (1969) noted that there is an underestimate of convictions because of inadequate record keeping systems. Also, original charges are not shown on the driver or ciminal record once the sentence is reduced. A reckless driving conviction is often used in a reduction plea because it does not involve driver license suspension.

A graphic account of the discrepancies which can occur when reporting alcohol involvement can be found in an analysis of a fatal population of drivers, passengers, and pedestrians in Wayne County, Michigan (Filkins et al., 1970). Police identification of drinking involvement of the driver, and the actual BAC were compared. When the police report showed "had not been drinking" it was later determined by autopsy that 47% of those drivers actually had been drinking. Of those marked "not known if drinking," 69% actually had positive BAC and 63% were above BAC of 0.10%. As mentioned earlier, this same investigating team found that for 39% of a hospitalized alcoholic sample with DUIL offenses the offenses were noted only on the criminal record and not on the driving record. These findings illustrate the under-reporting that does occur.

Another illustration of this comes from Pollack (1969) who asked DUIL offenders if they had ever been stopped but not cited for drunk driving when they actually had been drinking. Sixty percent of the DUILs had been stopped at least once as compared to 14% of a random sample of drivers who were also drinkers.

One traffic and problem-drinking study in the United States seems to have successfully, and apparently without much diffi-

culty, obtained all of the pertinent related information other than driver or criminal record on the experimental population (Waller, 1967). The information came from welfare and social agencies, alcohol clinics, or hospitals. Two other studies attempting to obtain the same type of information (Filkins, 1970 and Pollack, 1969) found that the effort was extremely time-consuming with little yield of comparable information--though the sources are potentially fertile.

Selzer (1970) also noted that shortcomings are numerous in obtaining information on alcoholics from agency searches. The descriptions provided by agencies are often cursory and variable and statements concerning alcohol behavior and consumption are difficult to evaluate. Finally and understandably, many medical and social agencies will not permit record searches because of the confidential nature of their work (Smith, 1970).

Hospitals tend to be among the most inaccurate sources of information for diagnosing problem drinking. According to Barcha, Stewart and Guze (1968), a high rate of alcoholism prevailed in the general medical wards of large hospitals but physicians and staff caring for these patients generally did not recognize the alcoholism. They also cited previous authors who found similar results (Green, 1965; Nolan, 1965; and Pearson, 1962).

Kearney, Bonime and Cassimates (1967) stated that about one-tenth of a sample of 651 patients was suffering from abuse of alcohol. According to the authors, private physicians were loathe to write the word "alcoholic" on the charts of their private patients.

The probability of having more than one type of record indicative of problem drinking is relatively unknown since most investigators have not indicated the percentages of their experimental groups with more than one type of recorded information.

As can be seen from a sample driver record (Table 1) of a DUIL offender, it is possible to have a number of previous recorded offenses, which alone would indicate a problem. However, in other instances only one indicator may be present. (This may in fact be due to under-reporting.) Indicators of problem drinking which were defined in the Wayne County Fatality Study (Filkins et al., 1970) were: (1) BAC of 0.25% or higher; (2) one DUIL offense; (3) one drinking conviction not related to driving; (4) cirrhosis of the liver, which 75% of the time is caused by alcohol abuse, (Harrison, 1966); and (5) diagnosis of alcoholism or excessive drinking on a social or medical agency record, or a report of alcoholism by the identifying witness at the morgue. Eighty-two percent of those with drunkenness offenses not related to driving had more than one indicator of problem drinking. For example, they may have had a drunk and disorderly offense and a high BAC above 0.25%. However, the other fatalities showing indicators most often had only one: 82% of those with BAC higher than 0.25%, 78% of those with a DUIL conviction, 55% reported to be alcoholic by a morgue witness, and 64% of the cirrhotics, had no other indicator. Eighty-nine percent of those defined to be problem drinkers had only one indicator present.

According to the literature reviewed, high blood alcohol concentrations, multiple arrest history and/or driving violation records appear to be useful indicators of problem drinking. When records are "clean," however, it cannot be assumed that the offender is problem free. In such a case, especially, the presentence investigator will find other diagnostic means, such as a psychological procedure, very valuable.

MEDICAL SYMPTOMS OF ALCOHOLISM. Two modes of determining early medical symptoms of problem drinking were reviewed: (1) oral interview questions, and (2) medical tests. None of the latter appear to be useful within a court setting at this time but a discussion of the various tests can be found in Appendix A.

TABLE 1. SAMPLE DRIVER RECORD OF A DUIL OFFENDER[a]

Date	Event	Response
DEC 1959	Reckless Driving.	
SEP 1960		Re-exam, instructions given.
DEC 1960		Re-exam, restricted license issued, may drive to and from work, and on road for testing cars.
NOV 1961		License appeal board hearing, restrictions lifted
APR 1963	DUIL	Mandatory suspension of 3 months.
OCT 1963	Prohibited turn.	
JAN 1964	Speed 50/35.	
JAN 1965	Crash: 2 veh., 1 injury; DUIL conviction.	Mandatory suspension from NOV 1965-AUG 1966.
SEP 1965		Re-exam, license revoked.
OCT 1966		License denied on basis of 2 previous DUILs.
NOV 1966		License appeal board hearing, restricted license issued, no pleasure driving, NOV 1966-NOV 1967.
MAR 1968	Crash: 4 veh., 1 injury; improper driving, illness, not known if drinking.	
JUL 1968		Referred for review.
SEP 1968	Crash: 2 veh., 2 injuries; DUIL 0.34% W/V.	
OCT 1968		Re-exam, corrected physical condition.
DEC 1968		Mandatory suspension, DEC 1968-JUN 1970.
FEB 1969		Financial responsibility denied because of 2 or more convictions of DUIL.
MAR 1969		Favorable doctor's statement held by driver improvement.

[a]From: Filkins, L., in Proceedings of a Conference on Community Response to Alcoholism and Highway Crashes, Filkins & Geller (Ed.), The University of Michigan, Highway Safety Research Institute, 1970, p.56.

There are a number of diseases, e.g. cirrhosis, Wernicke's encephalopathy, and Korsakoff's psychosis, which are highly associated with previous long-standing alcohol abuse and probably could be considered as diagnostic of past alcoholism. These diseases are late manifestations, appearing most frequently in the late fourth to sixth decades of life. This is well beyond the average age of a person coming before the court for an alcohol-related offense. The diseases are frequently debilitating and a person so afflicted is less likely to be in trouble with the police than he was in the years previous to this illness. To wait for the appearance of one of these complications before attempting diagnosis is to sacrifice the identification of the person at the time of his highest risk to himself and society and at the optimum time for therapeutic intervention. Therefore, the classic medical signs of alcoholism are not the optimum criteria to use for the identification of the problem drinker in the court setting.

There are, however, a number of medical signs which in and of themselves are not diagnostic of problem drinking but are suggestive and supportive of such a diagnosis. Pollack (1969) found that alcoholics frequently described themselves as having "poor health." He also found that many stated their health would improve if drinking stopped. Multiple vague complaints in a young person should raise suspicion of heavy drinking. Persons who state that their health would be better if they quit drinking have probably consciously or unconsciously identified their own problem.

Certain disease states are more common in alcoholics than in the population at large and the current or past history of these should be noted. Harrison (1966) reported that a disproportionate incidence of ulcers and pancreatitis exists among alcoholics. Frequent episodes of gastritis are common in heavy drinkers (Aspects of Alcoholism, 1966). Present or past history of an enlarged liver, in the absence of a history of hepatitis, malignant or parasitic disease, is highly related to drinking (Harrison, 1966).

A history of the current medications used by the person will frequently give a clue to an underlying drinking problem. Alcoholics have great difficulty sleeping (Johnson, 1970) and frequently use sleeping pills to correct the problem. Alcohol produces a cross-tolerance with the barbiturates and many of the other sedatives (Lieber, 1969) and for this reason alcoholics will often take more than the average dosage of one pill at bedtime. Alcoholics are also frequent users of tranquilizers and as Bates (1965, 1966) pointed out, they are likely to pyramid the dosage. Medication, other than aspirin, taken the day after drinking to "help with the hangover" should arouse great suspicion (Bates, 1965, 1966; Kalant, 1961).

Some of the best and most reliable clues to problem drinking come from obtaining an in-depth history of the drinking behavior. A history of binge drinking is pathologic and indicative of a problem with the control of alcohol (Horn and Wanberg, 1969; Jellinek, 1952). The frequent inner feeling of a "need for a drink" demonstrates that alcohol is taking on an unusual and unhealthy importance in the person's life (Alcoholics Anonymous World Services, Inc., 1955). Jellinek, in his description of the phases of alcoholism has pointed to blackouts as an early sign of uncontrolled drinking. Marked change in behavior under the influence of alcohol are other signs which should be carefully noted. This is particularly true when the change is one of uncontrolled aggression. Both Clark (1966) and Wanberg and Horn (1970) report increased aggressive behavior while drinking as a common characteristic of the problem drinker.

The appearance of withdrawal symptoms following drinking episodes demonstrates the development of physical dependence on alcohol and is almost diagnostic of alcoholism (Mendelson, 1970).

Morning hand tremor is the most common of the withdrawal symptoms (Maxwell, 1960; Wanberg, 1969). Morning nausea and

vomiting are also frequently reported occurrences in the problem drinker (Marjot, 1970; Harrison, 1966). To control the withdrawal symptomatology alcoholics resort to morning drinking, and so morning drinking should be considered a sign of withdrawal symptoms (Maxwell, 1960).

The past history of medical treatment frequently will reveal problem drinking. If the person has sought consultation or treatment for his drinking or problems related to his drinking, Selzer (1966) feels that the person probably has an alcohol problem.

Recent studies are showing a positive relationship between home, occupational, and traffic injuries (Wechsler, 1969; Kirkpatrick, 1967; and Filkins et al., 1970). The individual who has a history of being treated frequently for injuries should be suspect of heavy alcohol intake.

The early medical diagnosis of alcoholism is based upon the history obtained from the individual himself, his family, and associates. The physical signs of alcoholism, found during physical examination are late manifestations of the illness and are of little value in the diagnosis of the disease in its early phases. Fortunately, most problem drinkers will exhibit a number of the non-specific signs and symptoms just discussed. Taken together these can point strongly toward the diagnosis of early problem drinking.

SELF-REPORT INFORMATION. Information on problem drinkers can be derived using several self-report techniques; namely, tests, interviews or questionnaires, and surveys. Psychological and case history, personality, and drinking patterns of problem drinkers are possible subject categories covered by these techniques.

A number of the studies reviewed in this area statistically analyzed the data to find specific test items or sets of items which would discriminate between alcoholics and nonalcoholics.

Other studies revealed the tendencies of problem drinkers to have certain personal characteristics in common. These tendencies were shown by determining the proportions of problem drinkers giving each response. They may or may not have been compared to the proportions of nonproblem drinkers answering the same questions.

The studies will be categorized according to the techniques used to obtain the self-report information.

Tests.

Scales Derived from the MMPI. Rhodes (1969) attempted a cross validation of MacAndrew's scale (A_{MAC}). His alcoholic group consisted of 200 male outpatients from an alcoholic clinic and his control group contained 200 nonalcoholic outpatients from a university psychiatric clinic. The utility of the scale was confirmed, with 76% of the subjects correctly classified.

Rich and Davis (1969) performed a similar study, using the A_{MAC} scale, the Hoyt and Sedlacek A_H scale, Hampton's A_L scale, Holmes A_M scale, and a new scale called A_{REV}, composed of 40 items common to at least two of the scales A_H, A_L, and A_M. They used three criterion groups of 60 males and 60 females each--alcoholics randomly selected from a state hospital population, nonalcoholic psychiatric patients randomly selected from the same hospital, and controls selected from employment applicants and college volunteers. The A_M, A_{REV}, and A_{MAC} scales were approximately equal in discriminative ability. All were able to discriminate alcoholics both from normals and from controls with an accuracy of about 75%, a figure consistent with previous studies. The other two scales were appreciably poorer in discriminative ability.

Uecker, Kish, and Ball (1969) administered the A_H, A_L, and A_M scales to 109 nonpsychotic alcoholic males admitted to an alcoholic treatment unit at a veteran's hospital, and to 56 psychiatric patients free of secondary diagnoses of alcohol, admitted to the same hospital. They found, using *t* tests, that the mean scores of the two groups differed significantly on the A_H and A_M

scales but not on A_L. They did not report proportions of cases correctly identified.

Rosenberg (1970) extensively discusses previous research on the use of scales derived from the MMPI and also constructs an empirically validated composite scale derived from the previous scales. He emphasizes the value of using items which were selected in common by several of the previous studies, but points out that such items are few. He suggests that further analyses be performed on any set of discriminating items to attempt to determine the basic personality traits which are measured by these items. Scale 4 (Pd) of the MMPI has been found in a number of studies to discriminate alcoholics from nonalcoholics within a psychiatric sample. A factor analysis of this scale by MacAndrew and Geertsma (1963) found five factors, only two of which discriminated between alcoholic and nonalcoholic psychiatric patients. These two factors, which they name Social Deviance and Remorseful Intra-punitiveness, contained only eighteen of the fifty items included in the scale. Rosenberg feels that, after empirically discriminating sets of items have been selected, further analyses of this kind should be performed to determine the underlying trait structure so that the results of different studies may be more readily compared and the underlying dynamics of the alcoholic syndrome better understood.

Rosenberg discusses several previous studies in which alcoholism scales were derived. He concludes that Hampton's scale is relatively invalid, as is the Linden (ALX) scale (Linden, 1960). He then proceeded to construct a composite alcoholism key, consisting of items common to two or more of the three scales he considers valid, namely those of MacAndrew, Hoyt and Sedlacek, and Holmes. The alcoholic sample used in validation consisted of 111 male veterans admitted to an alcoholic treatment unit in a veteran's hospital. Control groups consisted of 34 inmates from a federal

penitentiary, with a mean length of stay approximately equal to that for the alcoholic felons, and 56 miscellaneous nonalcoholic psychiatric patients from the same veteran's hospital. The inmate groups were subsequently eliminated from some of the later analyses due to small sample size and the fact that the control group contained heroin addicts.

MMPI protocols of these subjects were scored according to a large number of derived scales and other variables. The Rosenberg composite key, the MacAndrew key, the Hoyt and Sedlacek key, and the Holmes key all discriminated significantly between the alcoholics and the controls. The point-biserial validity coefficients were .25, .31, .28, and .22, respectively. The Hampton and Linden keys failed to discriminate significantly. The composite key, which derived nearly all its validity from the items which were common to only two keys, showed no significant validity. Rosenberg used the various keys and scales on which the protocols were scored to construct several test batteries by means of stepwise multiple regression techniques. Multiple correlations ranging from .47 to .59 with criterion group membership were obtained.

Rosenberg notes that both invalid keys showed very high correlations with the Welsh A (anxiety) factor, and that Linden's invalid key correlates highly with age. He extensively discusses the various combinations of items which prove to have predictive value and the reasons for the relatively low item overlap between various studies.

Freed (1968) administered the Gordon Study of Interpersonal Values to 39 male alcoholics and 29 nonalcoholic psychiatric patients in a veteran's hospital. The alcoholics scored significantly lower on "leadership" and significantly higher on "support" and "independence." Freed interpreted the latter finding as denoting greater antisociality.

Carroll and Fuller (1969) elicited descriptions of the self and of the ideal self, using the Standard Adjective Q Sort, from five criterion groups. Each group consisted of 20 white male subjects, approximately equated on age, IQ, education, and occupational status. These groups were as follows:

1. Alcoholics following a short detoxification period in a hospital.
2. Alcoholics following six months of sobriety in prison and six months voluntary participation in Alcoholics Anonymous.
3. Alcoholics following six months of sobriety in prison.
4. Nonalcoholic prisoners following six months incarceration.
5. Nonalcoholic, noncriminal job applicants.

The self-ideal discrepancy scores of the alcoholic groups significantly exceeded those of the nonalcoholic groups. The scores of the short-term hospitalization group significantly exceeded those of the group which had six months enforced sobriety plus AA participation.

The scores of the non-AA prison alcoholics did not differ significantly from those of the AA members nor from those of the hospitalized alcoholics. The authors concluded that enforced sobriety and AA membership interact to produce less discrepancy. There are unfortunately several attractive alternative hypotheses which explain the findings equally well. The effects of sobriety and of AA membership may well be additive, with the failure to find significant differences due to either factor alone being simply a type II error. The pattern of the differences tend to suggest this hypothesis. Also, alcoholics with less discrepant self-concepts may be more likely to become prisoners, or AA members, or both.

Koller and Castanos (1969) investigated a group of 210 alcoholics, 163 male and 47 female, who were admitted to an Australian alcoholic clinic. Their control group consisted of 210 miscellaneous normal subjects so selected as to match the alcoholic group on age, sex, and socioeconomic status.

The subjects were questioned about their family backgrounds and present living arrangements. Personality traits were assessed by the Eysenck Personality Inventory. Past intellectual functioning was tested with the Mill Hill Vocabulary Scale, while present functioning was assessed by Raven's Matrices.

The alcoholics had a significantly greater incidence of loss of one or both parents before age 15, a significantly larger proportion of male siblings, and significantly older fathers. They were significantly higher on Eysenck's second-order "neuroticism" factor and significantly lower on the second-order "extraversion" factor, and showed a significant degree of intellectual deterioration. The alcoholics who had not suffered parental loss tended to have older fathers and mothers and to have started drinking later in life than those suffering such loss.

Measures of Sex Temperament. Zucker (1968) hypothesized that heavy drinkers show more covert cross-sex identification and compensate by overtly emphasizing the conventional sex-role behaviors. He divided a group of 168 male and 176 female high school students into light, moderate, and heavy drinkers on the basis of a self-report questionnaire. Overt sex-role identity was tested by the Fe (femininity) scale of the California Personality Inventory. Covert identity was assessed by an open-ended measure in which subjects were used to name books and movies they strongly liked or disliked. Sex-role identity scores were determined by content analysis of these materials.

The heavy-drinking males scored significantly more masculine

on the overt measure, but there were no significant differences on the covert measure. No significant differences were found for females on either measure.

Parker (1969) tested the same hypothesis using the ALCADD test as a measure of problem-drinking tendency and the Terman-Miles M-F test as a measure of sex-role identity. This test is provided with two scales--one standardized on normal populations, which Parker regards as a measure of manifest masculinity, and one based on responses of passive male homosexuals, which Parker regards as an inverse measure of latent masculinity.

Parker found that high scores on the ALCADD test were associated to a significant degree with high "manifest masculinity," low "latent masculinity," preference for the mother over the father, a high proportion of female siblings, and a measure of "tension-anxiety" derived from selected items in the tests used.

Measures of Time Perspective. Foulks and Webb (1970) administered the Time Reference Inventory to a control group of 30 rubber workers and four groups of 30 patients each from a veteran's hospital. The four patient groups consisted respectively of chronic schizophrenics, acute schizophrenics, depressives, and alcoholics.

The "past extension" and "future extension" scores for the alcoholics were lower than for any other group, that is, the alcoholics tended to think more in terms of a short time span centered about the present. They also tended to think of pleasant events as occurring in the near future, a tendency which the authors interpreted as wishful or magical thinking.

Smart (1969) conducted a similar study. He used a group of 33 alcoholics, all of whom had long histories of uncontrolled drinking and unsuccessful therapy.

His control group consisted of 33 social drinkers, including employment agency clients, skilled tradesmen, and a few professionals. Two tasks were used. The first consisted of the subject's naming ten future events that might occur in his life and estimating a probable age for each. At the end of the experiment, cards containing the subject's responses were given back to him and he was asked to place them in the chronological order in which he expected them to occur. This last procedure was used as a measure of "coherence," i.e., the degree to which the rankings corresponded to the ages previously given. The second task consisted of telling four stories, each based on a prescribed opening sentence. The time period covered by the content of the story was used as a measure of extension.

The future extension of the alcoholics was significantly shorter on the first task and on two of the four stories in the second task.

Coherence scores for the alcoholics were very difficult to obtain as most were unable to order the events completely or assign ages to them. The twelve for whom meaningful coherence scores were obtained were significantly less coherent than the social drinkers. The difference between groups based on these scores is, of course, a very conservative estimate of the population difference, since only the most coherent of the alcoholics were involved.

Other Measures. Haertzen and Panton (1967) report development of a psychopathic scale (P_{YP}) from the Addiction Research Center Inventory (Hill et al., 1963). The ARCI consists of 550 items dealing with personality traits, physical symptoms, and subjective effects of drug use.

A total of 1,022 assorted subjects were used in the validation of this scale. They consisted of college normals, opiate

addicts, mentally ill patients, alcoholics, and criminals. The latter two groups were exclusively male, while the others were mixed.

The scores significantly differentiated between the groups, with the addicts scoring the highest, followed by criminals, alcoholics, and patients, with the normal group scoring the lowest.

Overt Problem-Drinking Tests. Park (1958) constructed a problem-drinking scale for use with college students. It consists of twelve positively weighted items: "has felt that subject might become dependent on or addicted to the use of alcoholic beverages"; "has incurred social complications due to drinking"; "has feared the long-range consequences of own drinking"; "drinks large or medium amount of alcoholic beverages at a sitting and more than once a week"; "likes to be one or two drinks ahead without others knowing it"; "has gone on the water wagon as the result of self-decision or advice of family or friends"; "has become drunk when alone"; "has had one or more drinks alone"; "has had one or more drinks before or instead of breakfast"; "has gone on weekend drinking sprees"; "has been led by drinking to aggressive, wantonly destructive, or malicious behavior"; "has experienced blackouts in connection with drinking"; and one negatively weighted item, "drinks to comply with custom."

To validate Park's problem-drinking scale as a predictor of prealcoholics, Williams (1967) conducted two studies, one featuring sociometric data, the other comparing "problem drinkers" to alcoholics in terms of nonbehavioral aspects related to drinking. A series of inventories, including the problem-drinking scale, was completed by 91 male college students who also participated in a fraternity party as part of the first study. Later, 87 of the students completed a Questionnaire including first drinking experience and containing such validation material as: who at the party they considered (a) "big" drinkers, (b) people who sometimes or often get into trouble because of drinking, or (c) people who now have or will have a drinking problem.

Highly significant correlation was found between problem-drinker scores on the scale and reputation as a "big" drinker, getting into trouble because of drinking ($p<.0001$), or present or future drinking problems ($p<.0005$). Problem drinkers were more able to recall their first drinking experience than non-problem drinkers ($p<.05$), and were more likely to have experienced effect from it ($p<.001$).

In the second study, 289 male college students, all drinkers, answered questionnaires designed to compare problem drinkers and alcoholics on such aspects as first drinking experience, parental attitudes toward drinking, and use of alcohol for personal or social effects. The data on parental attitudes lend some support to the hypothesis that problem drinkers, like alcoholics, would have a greater proportion of mothers who disapprove of drinking nonproblem drinkers (but having disapproving mothers is not typical for either group). Parental disagreement on drinking was more frequent and more extreme in the case of problem drinkers. Problem drinkers were more likely than nonproblem drinkers to desire alcohol for personal effects ($p<.001$). The data suggest that problem drinkers who are beginning to drink like alcoholics will continue to do so, and a substantial proportion will become alcoholics.

The alcohol study unit (Nathan et al., 1970) at Boston City Hospital utilized alcohol ingestion as a variable to permit study of drinking behavior of chronic alcoholics. Twelve white male alcoholic subjects were used.

Findings indicated that the perceived decrease in anxiety and depression was not the reinforcing element that led the alcoholics to drink, because anxiety and depression actually increased with alcohol consumption.

A behavior which was most noticeable was that, whether sober or drunk, most of these alcoholics preferred to be by themselves.

Questionnaires. Wanberg and Knapp (1970) used the drinking history questionnaire (DHQ) routinely administered to patients admitted to the Alcoholism Division of the Fort Logan Mental Health Center, Denver, Colorado to study background and drinking differences between men and women alcoholics. The 68 DHQ items were administered to 1657 males and 365 females and a point biserial correlation and phi-coefficient were used to test for sex differences. An alpha level of .10 was used for both tests.

Some 13 variables of drinking symptoms and behavior differed significantly between 1657 male and 365 female drinkers. The results indicated that women drink less beer and wine, drink alone and at home and go on shorter binges, are more apt to admit their drinking is getting worse, yet are judged by treatment staff as having a less severe expression of alcoholism. Men are more apt to lose jobs and miss work due to excessive drinking, and are more apt not to drink with their spouses. Males begin their drinking history much earlier, yet both men and women arrive at treatment at about the same age. The data seem to indicate that men and women excessive drinkers differ more on the behavioral level, yet the results of excessive drinking seem to be similar for both groups. That men drink more beer and wine and go on longer binges may be due to difference in style, and also may point to basic constitutional differences between sexes (e.g., men can drink longer and more due to physical differences).

An important result to be noted is that all of the 13 correlations which differed significantly from zero, are in fact, quite low. This indicates that men and women, though differing on a few drinking symptoms and behavior, are quite similar when comparing them at the individual variable level.

Surveys. Dr. E.M. Jellinek (1952) developed a concept of the phases of alcoholism based on the findings of a drinking history questionnaire given to 2000 members of Alcoholics Anonymous.

This concept emphasizes the fact that there are two types of alcoholics: alcohol addicts, and nonaddictive alcoholics. Jellinek believed that the disease concept of alcoholism should only apply to the alcohol addict, namely the individual who has lost control over alcohol intake. However, in both groups of alcoholics, excessive drinking is symptomatic of underlying psychological or social pathology. Only the addictive alcoholic is subject to improvement by medical-psychiatric treatment. The nonaddictive alcoholic should be managed by the applied sociologist. He is a sick person, but his malady is not excessive drinking, but the psychological and social difficulties from which alcohol intoxication provides relief.

Jellinek describes the development of drinking patterns or symptoms in alcohol addiction and concomitant results. The symptoms are not necessarily all present in one individual nor do they necessarily follow the same sequence. However, the phases and the sequence of phases are characteristic of a typical trend for alcohol addicts.

Initially, drinking for the alcohol addict reaches toward the goal of relief from emotional stress. He drinks more heavily than others in his social group but usually his drinking is not conspicuous. After a time, the drinker develops an increase in tolerance and needs more alcohol to produce a sedative effect.

The prodromal phase is the beginning of alcohol addiction. Its most prominent characteristic is the occurrence of behavior resembling "blackouts." The drinker has ingested considerable alcohol without showing obvious signs of intoxication, but the next day he lacks memory of part or the entire situation.

Jellinek felt that even nonaddictive alcoholics on occasion achieve memory loss. But for the nonaddict, this infrequently occurring event usually comes after marked intoxication.

In the addictive drinker, the alcoholic "blackout" is generally followed by the onset of drinking behaviors which indicate that alcohol is being used as a drug to meet nonbeverage "needs." The behavior includes surreptitious drinking, preoccupation with drinking, gulping, and increased frequency of memory interruptions. He then begins to cover up by withdrawing from social situations where people notice the quantity of alcohol consumed. At this stage, interruption of alcohol addiction is possible because the individual notices and fears the consequences of his drinking behavior. But if the individual is not helped at this beginning stage, he slips further into patterns characterized by rationalization, conspicuous grandiose behavior, increased aggressiveness, periods of remorse and abstinence, and the presence of ineffective rules for control of drinking. This is followed by loss of jobs and friends, and then isolation. At this point life is oriented to alcohol consumption. Neurosis shows itself in terms of an additional reorganization of activities so that nothing will interfere with drinking. Then there is self pity, unreasonable resentment, and remorse.

Formerly it was felt that the individual must reach this defeat in order to be helped, but clinical experience has shown that even incipient alcoholism can be intercepted.

Cisin and Cahalan conducted the first large national survey for the purpose of providing drinking practice information of the general population (U.S.) and to provide a baseline for longitudinal studies of problem drinking. The 2,746 adults obtained by the rigorous random probability sample in late 1964 and early 1965 represent a 90 percent completion rate. A fairly long interview covering (1) drinking behavior, (2) social correlates at

drinking, and (3) psychological correlates of drinking was personally administered to each person. The findings from this survey are discussed in the following reviews.

Cisin and Cahalan (1966) illustrate some of the social, psychological, and demographic characteristics that are related to levels of drinking, with emphasis upon differences between abstainers and heavy drinkers. Special note is made of monotonic and nonmonotonic relationships across the three drinking categories.

Information is presented on "group differences" (sex, age, and income), "background characteristics," "social activities," "drinking environment," "concerns about drinking," "activities that are 'very' or 'fairly' helpful when depressed or nervous," and "personality attributes and personal problems."

The people who were hardest to track down and induce to cooperate were found to be heavier drinkers, on the average, than those who were easier to interview.

Cahalan and Cisin (1968) also reported that adults (over 21) were interviewed by over 100 male nonabstaining interviewers. The responses of the adults randomly selected within a household were weighted by the number of adults in the household.

The following classifications were made by a quantity-frequency-variability index: abstainers 32%, infrequent drinkers 15%, light drinkers 28%, moderate drinkers 13%, and heavy drinkers 12%.

It was indicated that higher urbanization is associated with a higher proportion of heavy drinkers and a lower proportion of abstainers and light drinkers. The prevalence of drinking varies directly with an individual's status within social levels. Men and young persons are the most prevalent drinkers. Whether a person drinks at all is associated with sociological and anthro-

pological variables. Personality variables explained some of the heavy drinking variations. There is also a considerable turnover within the drinker and nondrinker classifications. Older persons tend to drop out of the heavy drinker class.

The following items from the same national survey (Cahalan and Cisin, 1968) were reported to be escape reasons for alcohol consumption:

(a) I drink because it helps me to relax.
(b) I drink when I want to forget everything.
(c) A drink helps me to forget my worries.
(d) A drink helps cheer me up when I am in a bad mood.
(e) I drink because I need it when tense and nervous.

Several of these "personal involvement" items were used in an effort to see if the drinker was using beverage alcohol as a mood modifier or coping mechanism.

Cahalan, in his book Problem Drinkers, (1970) also discusses the findings of this survey along with a follow-up survey. However, his book was received too late for written review.

Jones (1968) reports a longitudinal study of a group of primarily white, middle-class males in a California suburban area. These subjects were followed from ages 10 through 43. The subjects underwent extensive (about 12 hour) interviews with a clinical psychologist and were rated on a number of personality traits using the items of the California Q set. The subjects were also given two retrospective ratings on these by a team of three psychologists who studied all available records. One rating was made of the subject's personality as it was at the junior high school age level, and one at the senior high school age level.

The criterion groups were composed of seventeen men who were classified by the interviewer as "moderate drinkers," six who were classified as "problem drinkers," and two who were classified as "abstainers."

The problem drinkers differed significantly from the moderate drinkers on a number of traits. They were characterized as more extroversive, impulsive, sensuous, and masculine. Many of the traits which differentiated the groups at the adult level were also found to do so when rated at the earlier ages, particularly in junior high school. The problem drinkers were reported to have had problems in accepting dependency, and to have been precocious in adopting extroversive, stereotypically masculine behavior. Jones hypothesizes that the latter characteristic is a defense against sex-role conflicts.

Jones concludes that the personality patterns which are characteristic of problem drinking antedate the actual drinking behavior and are identifiable relatively early in life.

Interviews. Guze et al. (1962) reported on the psychiatric evaluation conducted in St. Louis on 223 consecutive male criminals assigned to the Missouri State Board of Probation and Parole for a six-month period spanning 1960-61. A systematic and structured interview was given under the guise of routine procedure to probationers, parolees, "flat-timers," and some relatives. Of the men assigned, 96% were interviewed. Those who were missed presumably went directly to state hospitals. The relatives of 90 of the 120 probationers and parolees were interviewed.

The clinical diagnoses were: 48% sociopaths only, versus 52% having some psychiatric disorder. The prevalence rates for the psychiatric disorders were: alcoholism, 43%; drug addiction, 5%; anxiety neurosis, 12%; and several other disorders, each 1% or less.

There were no significant differences between alcoholics and nonalcoholics in the following areas: injuries, psychiatric hospitalization, conversion symptoms, arrests for robbery, burglary, forgery and passing bad checks, larceny, and vagrancy. Also, no significant differences were found in family histories of nervousness, hospitalization for nervousness, nervous breakdowns, criminal behavior, parental divorce or separation, parental desertion, parental death and placing children in nonparental homes, school troubles (except fighting) and histories of running away from home over night. In addition, before age 15 there was no significant difference in rates of delinquency, antisocial behavior, and crime.

Alcoholism was shown to be associated with increased family history of alcoholism, family history of suicide, attempted suicide, reports of dishonorable discharge, demotion, AWOL, fines and court martial, fighting, job troubles and arrest.

Of note is the fact that of the criminals under age 21, 39% were alcoholics; among those 21-30, 55% were alcoholics, and among those 30 or over, 64% were alcoholics.

In this study most of the subjects were young and of lower socioeconomic status. Of those diagnosed alcoholics the mean age was 24. Heavy drinking did not appear in many of the alcoholics until after the onset of antisocial behavior before age 15.

It is suggested that drinking behavior itself and its consequences comprise most of the alcoholic versus nonalcoholic differences found in this study.

Guze et al. (1963) reports on the comparison of interview responses to the drinking history questions given to 90 male criminals and their relatives in a joint interview in St. Louis,

Missouri. These 90 men (39 of whom had independently been diagnosed alcoholics) were the subset (who had interviewable relatives) from a male criminal population of 223. The comparison showed that disagreement between man and relative was such that in 80% of the disagreements the man was volunteering the positive response toward alcoholism diagnosis. The diagnosis of alcoholism could be made in 97% of the 39 alcoholics on the basis of the man's interview results alone, but a similar diagnosis could be made in only 41% of the cases on the basis of only the relatives' interview. Disagreement averaged 15% between subjects and their relatives for the entire sample, but 26% between alcoholics and their relatives. It should be noted that many of the alcoholics were young, in the earlier stages of alcoholism.

A statistical review was made (Hunter, 1963) of 281 cases randomly selected from individuals with at least one interview at the Family Service of Metropolitan Detroit. Twenty-one percent of these individuals revealed problems of excessive drinking; nearly always in the husband. The article discusses the importance of developing a preventive program to enable early phase alcoholics to be identified and treated. However, it pointed out that the characteristics most associated with the early phase alcoholic in the family agency is that he is hidden, i.e., he has made no overt effort to seek care or treatment. He avoids medical examinations or help for ordinary health problems. Most of the men surveyed were married and living with their wives. The wife usually recognized the seriousness of the drinking but felt that the responsibilities of married life would modify the husband's behavior. However, with the increase of responsibility there was an increase in problem drinking. The drinker usually was able to mask and obstruct the seriousness of the problem by his ability to work and remain sober for brief periods. These behaviors do not fit the stereotypic alcoholic. Hunter also reports that rarely was drinking the event that precipitated the wife's application to the family agency.

Curlee (1969) interviewed 100 consecutive female and 100 consecutive male admissions to a private alcoholism treatment center in Center City, Minnesota. Most patients were middle class and intact socially. Only eight men related the onset of excessive drinking to specific problems whereas 30 women made such an association. Twenty-one of these women lacked identities except those of wife or mother. When their external reference point was disturbed they suffered an identity crisis. All of them retreated into solitary drinking in their own homes and progressed within months to a year or two to symptoms characteristic of the later stages of alcoholism. The self-destructive element seems to be working here as these 21 women progressed much faster than the others into alcoholism.

Roman and Trice (1970) discuss occupational factors which increase the risk of problem drinking.

Two factors (i.e., absence of supervision and low visibility of job performance) precipitate the development of problem drinking. In addition, so do such factors as (1) lack of production goals, (2) flexible work hours and output schedules, (3) job status which keeps one isolated from associates and supervisors, (4) anxiety caused by the absence of structure, (5) work addiction, (6) occupational obsolesence, (7) a job role which is not well understood by the organization, (8) a job role which requires drinking, or (9) a job where drinking is the desired means of releasing tensions.

INTERVIEWING TECHNIQUES. While much of the available literature and research on interviewing is aimed primarily at the employment situation, the principles are nevertheless relevant to a wide variety of other situations.

Overview and Philosophy. Several functions of the interview are listed by Bingham (1949) and Siegel (1969). The primary one, of course, is the obtaining of information about the client which cannot readily be obtained by other methods. In addition, however, the Interview can also serve to establish friendly relationships between the client and the institution represented by the interviewer, and to give information to the client.

Gorden (1969) views the interviewer's task as consisting of two basic elements--maximizing the flow of valid and relevant information, and maintaining optimal interpersonal relations with the client. This is viewed as involving rewards, such as fulfilling expectations, giving recognition, and facilitating catharsis; and costs, such as competing time demands, and ego threats. The job of the interviewer is to lower the costs and increase the rewards. A variety of specific methods are discussed. Gorden stresses the importance of preplanning, following through with objectives, and careful postanalysis. Interview construction is also discussed and a comprehensive bibliography on all phases of interviewing is presented.

Sullivan (1954) discusses the interview in the context of psychiatric diagnosis. He views it as a special instance of interpersonal relationships in which two people, a client and an expert, attempt to develop a meaningful exchange of ideas to their mutual enlightenment, the aim being to benefit the client. The diagnostic interviewer must realize he is participating in the process of recovery. Therefore, his goal should not be merely to obtain factual data, but rather to obtain those data which are relevant to the therapeutic process. Sullivan also offers valuable advice on specifics such as overcoming anxiety and making interview transitions.

Bingham, Moore, and Gustad (1959) discuss the interview in terms of a communication system model. This model divides the

system into the following elements: (1) The message. This is the information which is to be exchanged. (2) The encoding device. This refers to the abilities of interviewer and client to translate the information into words or other symbolic behavior. (3) The transmission channel. This is the medium of physical energy exchange used to transmit the information. In interviewing there are multiple channels consisting of words, gestures, etc. (4) The decoding device. This refers to the interpretation of the signals received via the transmission channels. It is likely to be different for different individuals.

The authors point out that problems can arise in any of these subdivisions of the system, and that improvement of interviewing effectiveness is therefore dependent upon attending to each one and to their interrelationships.

Accuracy and Utility of Interview Data. The validity of data obtained by interview techniques, particularly those involving unstructured interviews in which the interviewer is given complete freedom to proceed as he chooses, is frequently unknown, and, when it is ascertained, tends to be undesirably low (Hinrichs, 1960; Hollingworth, 1923; Dunnette and Bass, 1963; Bellows and Estep, 1954; Kahn and Cannell, 1957; Weiss and Dawis, 1960; Weiss et al., 1961; Keating, Patterson, and Stone, 1950). A number of studies such as those of Wagner (1949) and Yonge (1956) have shown that the reliability and validity of interview data vary widely with the nature of the variable being assessed. Such things as generalized attitudes and interpersonal skills and behavior were most reliably and validly assessed.

The sources of low reliability and validity in the unstructured interview are various. Mayfield (1964) has extensively reviewed research in this area. One of the principal factors is that different interviewers are free to cover different material. For example, Pashalian and Crissy (1953) found that different interviewers were mutually consistent to a large degree in their

coverage of biographical data but very inconsistent in their coverage of attitudes. Another source of inconsistency in the information obtained is the failure to ask standardized questions (Webster, 1962). In addition, even when interviewers obtain the same information, they are likely to weigh it and interpret it differently (Wentworth, 1953). Another source of invalidity is personal biases or distorted interpersonal perception on the part of the interviewer. For example, Springbett (1958) found that interviewers tend to form judgments early, and often on the basis of irrelevant characteristics, e.g., personal dress. Furthermore, Bolster and Springbett (1961) found that the judgments were more easily influenced by unfavorable than by favorable information.

Siegel (1969) lists several sources of such biases and distorted perceptions. These include failure of the interviewer to establish rapport, resulting in excessive anxiety on the part of the client; preconceptions or stereotypes about members of certain groups; personal, idiosyncratic reactions to certain physical characteristics or mannerisms; "halo effects" or overgeneralization from some specific trait to an overall evaluation; and effects due to the form in which questions are asked (e.g. "leading" questions).

One method of overcoming the above problems is the use of the "structured" or "patterned" interview, in which the topics to be covered, and the order and manner in which they are covered, are predetermined (Siegel, 1969; Tiffin and McCormick, 1965). This has the advantage of ensuring that all relevant areas are covered systematically without sacrificing the flexibility required to cover each individual's unique background characteristics adequately nor the ability of the interviewer to make judgments (Fear, 1958). Various studies (McMurry, 1947; Hovland and Wonderlic, 1939; Yonge, 1956; etc.) have found satisfactory validities for this type of interview when properly conducted.

Interviewer Behavior. Richardson (1965) offers a valuable discussion of the personality characteristics of successful interviewers, and their selection and training. He also discusses question types, respondent participation, and other topics, and presents an extensive bibliography on all phases of the subject.

Kahn and Cannel (1957) stress the importance of the interviewer's understanding the interaction process with the client.

They also stress the need for interest, support, and understanding of the client and his needs. To maintain this atmosphere the interviewer must make sure the client appreciates the relevance and purpose of any excursions into new areas.

Garrett (1950) stresses the importance of the interviewer having a sincere desire to be helpful, respect for the client's feelings, and understanding of the client's feelings about the interview situation. She also presents helpful suggestions on many specific topics related to the mechanics of conducting the interview. Tiffin and McCormick (1965) point out the need to form an accurate impression of the client's level of understanding and to formulate the questions in a manner consistent with that level.

The United States Civil Service Commission (1955) offers a number of concrete suggestions:

1. Using open-ended questions which force the client to talk.
2. Pausing after a response by the client to give him a chance to continue.
3. Trying several different subjects initially to get the client to talk, but returning later to explore those on which he "froze."
4. Repeating key parts of client's response in questioning tone to get elaboration.

5. Asking one question at a time.
6. Making the question clear without suggesting the answer.
7. An interested manner, uninterrupted attention, and avoidance of implying criticism or impatience.
8. Avoiding highly personal questions until rapport has been established.
9. Not bringing the client abruptly back to the point when he digresses.
10. Using language appropriate for the client.

Hartman (1963) addresses himself to the problems of interviewing in the court setting by a probation officer or similar person. He points out the importance of understanding, interest, tolerance and acceptance, and empathy. He also states that the interviewer will be tested by the client to determine how he responds, e.g., whether he is judgmental, interested in the client as a person or interested only in gathering information. Hartman also discusses the art of listening and of understanding the meanings underlying both the client's responses and his silences.

Wenners (1957) discusses interview techniques that are useful with the alcoholic. She feels that all alcoholics are suffering from character disorder and that alcoholics' needs differ from the average drinker primarily in terms of intensity of characteristics rather than kind. The article suggests that the needs of the problem drinker can best be met with an interviewing technique which is conducted in a relaxed atmosphere. The emphasis should be on putting the individual at ease emotionally, rather than gathering facts for the sake of facts themselves.

The discussion which follows illustrates the steps taken in developing a diagnostic protocol. Many of the items which were used in the questionnaire and the interview as part of this protocol were drawn from the reviewed literature and found to be correlated with problem drinking.

Suggested methodology for developing an interview was also found in the literature and applied in developing the Client Interview (Form B). Techniques for conducting an interview, such as appropriate ways of developing rapport and expanding on pertinent issues, were incorporated into the Manual which will be used by the presentence investigator.

QUESTIONNAIRE DEVELOPMENT

OBJECTIVE. The objective of this phase of the research is the construction of a questionnaire which can be used in the court setting to identify offenders who are likely, if untreated, to continue a pattern of problem drinking and alcohol-related offenses. Because the social and economic costs both of untreated problem drinking and of unnecessary therapeutic intervention are high the validity of such an instrument must be as great as possible.

Due to the wide variety of situations in which it is to be used, the instrument must be standardized and objective, that is, its results must not be greatly influenced by the testing situation and their interpretation should be unambiguous.

CRITERIA. Because of financial and political limitations on the court system, the technique must be inexpensive to administer, need only minimal training of personnel involved in its use, be suitable for administration to individuals singly or in groups, and require minimal time. The procedure must be readily comprehensible by the testee and his responses must be easy to evaluate.

These considerations obviously rule out any tests requiring complex or specialized apparatus. They also rule out medical, physiological, or other tests which require the services of professionally trained persons and extensive equipment.

All of the above factors indicate the desirability of a self-administered written questionnaire. The questionnaire should be short and the mode of response simple enough to be readily understandable to persons of low socioeconomic and educational standing. It should also be easily, rapidly, and objectively scorable by untrained personnel.

The items should be subtle so as to discourage faking by the

testee. This means that it is desirable to avoid face valid items. For this reason, such a questionnaire must be constructed by an empirical strategy, that is, by starting with a large group of miscellaneous items and retaining only those which discriminate well between criterion groups known to differ on the characteristic under test. The Questionnaire developed by Mortimer and Lower (1970), which furnished a substantial part of the item pool, reflects such a strategy in its construction.

PROCEDURE. In order to fulfill the above criteria, it was decided to employ mainly items which could be answered in a true-false or yes-no mode. After reviewing the literature, it appeared that there were also a number of potentially promising items which could be answered by stating a number. Several of these were therefore included, as such items are also readily codable and scorable.

The item pool originally consisted of 135 items. These items were drawn from sources which are listed in Appendix B of this report. This number was expected to be reduced drastically by elimination of the least discriminating items in the initial validation process, thus yielding a questionnaire which could be administered quickly.

To satisfy the requirement of rapid and easy scoring, it was decided to weight each item equally in computing the overall score. This procedure has been found in previous studies to be nearly as efficient in discrimination as the use of optimum weights computed by multiple regression techniques (Guilford, 1954). The latter technique would lead to a scoring process so time-consuming and complex as to be clearly intolerable under the conditions of use contemplated for this Questionnaire. The rationale for the selection of the Questionnaire items can be found in Appendix C. A copy of the Questionnaire (Form A) used in the initial validation studies can be found in Appendix D.

INTERVIEW DEVELOPMENT

OBJECTIVE. The Interview is designed to help the court counselor and offender decide whether the offender is a situational drinking offender or a problem drinker. The areas of inquiry are: demography; health; drinking history; personal attitudes; and the quality and degree of interpersonal and community relationships. The diagnosis of problem drinking will be made only on evidence that there is dysfunction in several of these areas, and that alcohol is the primary mechanism used to cope with dysfunction. The unique advantage of this interview protocol is that the problem-drinking diagnosis may be based on behavioral information which in itself is useful to the court in determining an appropriate sentence.

Two types of questions are used: (1) standardized questions with yes-no or numerical responses, and (2) open-ended questions which allow a broader response and are designed to allow a further probe of the problem behavior. The responses to the questions and the interviewer's overall observation of the client will serve to aid the interviewer in making an accurate diagnosis.

CRITERIA. The criteria for the interview roughly parallel those for the Questionnaire. Because of the high work load of the court personnel, and the crowded dockets in many jurisdictions, the interview must be kept as brief as possible. It must be a uniform procedure to facilitate determination of its effectiveness and comparisons between different programs or between different court populations. The construction of the interview must be such that the responses may be readily coded into categories by the interviewer to facilitate the process of arriving at an objective score. This requirement is also important for any future item evaluation procedures which may be undertaken. At the same time, it is important that the construction of items which are readily codable and scorable should not excessively hinder the flexibility of the interviewer in developing rapport,

exploring unusual or questionable situations, or in making judgments based on the overall pattern of the client's responses.

PROCEDURE. The review of the medical symptoms associated with the presence of alcoholism has indicated the foundation for a number of the Interview questions related to those factors. The behavioral changes that accompany many of the medical changes in function are also relevant as are numerous other factors that interact to describe the etiology of alcoholism or excessive drinking. This information provided the core content for the Interview questions. This content was then written in the form of question items utilizing the criteria that have been described previously. The rationale for the selection of the Interview items is discussed in the Manual, Volume I.

The Interview consisted of a total of 66 basic questions, but since a number of questions had several parts and/or numerous possible independent responses it would be more appropriate to say that the Interview consisted of 245 separately codable items. A copy of the Interview (Form B), which was used in the initial validation studies is shown in Appendix E.

ADMINISTRATION OF QUESTIONNAIRE AND INTERVIEW

SUBJECT SELECTION.

Controls. All control subjects were volunteers who were paid a fee of $5.00 for their participation.

One of the major problems was to obtain a control sample which was reasonably representative with respect to age, sex, socioeconomic status, and demographic factors. It was not feasible, for economic reasons, to obtain a stratified random sample of the general population. It was therefore decided to seek to obtain subjects through existing groups such as civic, religious, labor, and other organizations. It was planned to select such organizations so as to obtain the desired heterogeneity in the sample. It was also planned to solicit some subjects through

advertising in media which reach select audiences and by collecting data in locations such as waiting rooms in various institutions and facilities.

While many organizations were very cooperative, certain difficulties were encountered. It was found that subjects were obtained much more readily when the organization lent its official support to the study by disseminating information about it to the members or when an insider aided in soliciting subjects or introduced the research team to the members. It proved impossible to obtain the needed cooperation from a labor union, and in one case in which interviewers were allowed to come to the union hall to solicit interviews "cold," the members present were for the most part sullen, apathetic, and somewhat suspicious; only one person was induced to participate.

Distribution of Groups Employed. The control groups consisted of 297 persons in all. There were 192 problem drinkers. The distribution of controls and problem drinkers by age, sex, and marital status is shown below in Tables 2 through 4.

TABLE 2. Age Distribution of Control and Problem Drinker Subjects in Frequency and Percent.

Age	Controls		Problem Drinkers	
	Frequency	Percent	Frequency	Percent
16-25	128	43.1	15	7.8
26-35	69	23.3	56	29.2
36-45	50	16.8	67	34.9
46-55	36	12.1	34	17.7
56-65	8	2.7	16	8.3
66+	6	2.0	4	2.1
Total	297	100.0	192	100.0

TABLE 3. Sex Distribution of Control and Problem Drinker Subjects in Frequency and Percent.

Sex	Controls		Problem Drinkers	
	Frequency	Percent	Frequency	Percent
Female	138	46.5	19	9.9
Male	159	53.5	173	90.1
Total	297	100.0	192	100.0

TABLE 4. Marital Status Distribution of Control and Problem Drinker Subjects in Frequency and Percent.

Marital Status	Controls		Problem Drinkers	
	Frequency	Percent	Frequency	Percent
Married	186	62.6	80	41.6
Single	96	32.3	25	13.0
Widowed	4	1.4	10	5.2
Separated	0	0.0	22	11.5
Divorced	11	3.7	52	27.1
No Data	0	0.0	3	1.6
Total	297	100.0	192	100.0

DRIVING RECORDS. An attempt was made to obtain all driving records of subjects for use in the final analysis of the data. These were obtained by the Institute on computer tape from the Driver Services Division of the Department of State. Each person who obtains a driver's license in Michigan is assigned a unique number. This number is constructed from the individual's name and date of birth. Subjects in this study were asked to give this number to the interviewer. Cooperation by the control subjects was almost universal, the only instances of difficulty being

those in which the subject did not have his license with him. These subjects were asked to call the number in later and most complied with this request. Many of the alcoholic subjects, however, were reluctant to give their driver's license numbers. All individuals who were unwilling or unable to give the interviewer this number were asked for their full name and birth date. These were taken to the Secretary of State's Office by a member of the research staff, and the numbers were constructed from them.

After the subject's driving license number was determined his record was obtained by a research team member from the Department of State. The record, which existed on computer tape, was then processed by the Institute's computer facility to extract the relevant information from the record. Records maintained on the Department of State computer system are purged of minor violations which are more than approximately seven years old. Serious violations such as DUIL remain on the record for the life of the individual.

As the above discussion implies there is relatively little difficulty in obtaining the driving records of those subjects holding valid Michigan driver licenses. The cooperation of the Department of State in this respect is excellent. No attempt was made in this project to obtain the records of those subjects who held out-of-state licenses or did not have a valid license.

TEST ADMINISTRATION.

Controls. The technique was administered to the control groups at a variety of times and places as follows:

Beth Israel Synagogue Sisterhood. These subjects were interviewed at the home of a member of the research team. This member served as a contact between the research team and the group, but did not participate in the actual interviewing. Four interviewers were used. Two were professional psychologists specializing in human factors and two were members of the research staff

who were graduate students in psychology. Interviews were conducted in a single session, lasting approximately four hours, in various rooms of the house. The atmosphere was a relaxed, informal one, with refreshments being served to those subjects awaiting interviewing or those who were finished. As all of the subjects had come for the express purpose of participating in the study there were no refusals. Problems in administration of the techniques were relatively minimal. This group could be characterized as intelligent and highly verbal and had many suggestions as to how the Questionnaire could be improved. Many of them wrote information which went beyond that requested or in some way qualified their answers.

Ann Arbor Firemen. These subjects were interviewed while on duty at the fire stations, in various vacant offices and rooms which were made available by the Fire Department. The three interviewers used were all members of the research staff who were also graduate students in psychology. Interviews took place during the morning and late afternoon hours over a three-day period. Of the seventy-two firemen who were present during the interviewing sessions, fifty-six volunteered and were interviewed. No special problems were encountered in administering the technique to this group.

Unitarians. These subjects were interviewed in a social room at the church. The interviewer was a member of the research staff who was a graduate student in psychology. Interviews were conducted on two afternoons approximately a week apart. As all of these subjects had responded to an advertisement in the church bulletin by telephoning to make an appointment, there were no refusals, nor were any unusual problems encountered in administering the techniques to this group.

Married Student Housing. Interviewing of these subjects took place either in their homes or at HSRI. Interviews were conducted mainly by a professional psychologist and were scattered

over several afternoons and evenings. These subjects were solicited by advertisements on bulletin boards and in a newspaper which was published for residents of the University's married housing complex. One couple who called in response to the advertisement declined to participate when they learned the nature of the study and the fact that the data would be input to a computer. However, there were no other refusals or difficulties encountered in obtaining the cooperation of this group.

Michigan Employment Security Commission. This group was solicited through posters which were placed in the offices of the commission. Subjects who had come to the office to seek assistance in finding jobs or to collect unemployment benefits were encouraged to participate in the study. Interviewing was done by three different members of the research staff, two of whom were also graduate students in psychology, while the third held a bachelors degree in an unrelated field. Two interviewers were used during each session, and data were collected over a period of several days. Interviews were conducted in a private office, and at a desk secluded from the main room of the offices by a high partition. It is not possible to estimate the proportion of potential subjects present who were willing to cooperate, since the total number of such persons is not known, but some of the persons present appeared willing, and in fact, eager to participate for the sake of the fee involved.

Art History Students and Friends. These subjects were solicited by a professor in the department who was known to a member of the research staff. Four different interviewers were employed at various times, with two used during any given session. One was a professional psychologist, two were staff members who were also graduate students in psychology, and one possessed a bachelors degree in an unrelated field. Interviews were conducted in two faculty offices provided by the department. Since subject solicitation was done and appointments were arranged through the

above-mentioned faculty member, it is impossible to estimate the proportion who volunteered. However, interest in the study appeared high.

Miscellaneous Faculty Group. This group was solicited by the same faculty member who made arrangements with the Art History Student Group. The setting and other conditions of administration were highly similar to those for the Art History Student Group.

Miscellaneous Student Group. This group was interviewed at the Institute's facility in the offices of several members of the research team, principally one professional psychologist and two staff members who were also graduate students in psychology. This group was most eager to participate and, in fact, it was necessary to discourage them from recruiting large numbers of their friends and acquaintances because of the disproportionate age distributions which would have been obtained.

Instructions which were read to each control subject were those contained in the cover sheet for Form B (the personal interview). The time required for each subject ranged from about thirty minutes to about one hour total, with the modal time being approximately forty minutes. Of this time, about half was devoted to the Questionnaire and half to the Interview.

Problem-Drinking Groups. The following is a brief description of how the Interviews were administered to each of the problem-drinking groups.

The Hospital Rehabilitation Programs. The alcoholism therapists at Annapolis and Providence Hospitals in Michigan agreed to use the protocol as part of their intake procedure for persons who had been diagnosed as alcoholics and referred to the program by a physician. Each therapist was instructed in the use of the Interview and a practice run was conducted. One of these therapists was a professional counselor, the other was an alcoholic

with a long period of sobriety. Both individuals interviewed clients in the hospital, where privacy was available. Other hospitals which also used the protocol were Brighton and Sparrow Hospitals in Michigan and Fort Logan Hospital, Denver, Colorado. A total of 98 persons were given the protocol in a hospital setting.

House of Correction. Prisoners at the Detroit House of Correction were interviewed by two members of the research team, and the jail's paraprofessional alcoholism therapist. All of the criminal respondents were convicted on drinking-related offenses and each individual had volunteered to participate in the alcoholic rehabilitation program. The Interview was explained to the prison therapist and an initial interview was conducted. He than interviewed several of the inmates.

Some difficulty was noted in that it took so much time for these individuals to read the Questionnaire and many of the items in the Interview were not applicable to people who had been in jail for a long period of time. Several times the Questionnaire was read to the respondent because he could not read.

The Interviews were all completed at the jail. Space was very cramped and often other inmates could overhear the responses. However, the individuals were very cooperative. The Toledo House of Corrections also administered the Questionnaire and Interview. A total of 19 persons from houses of correction participated.

A Counseling Service for Problem Drinkers. The Greater Detroit Council on Alcoholism offers a counseling service to alcoholics. Its primary function is to provide adequate referral to community treatment programs. A professional counselor is employed by the council. He administered the Questionnaire and Interview to three known alcoholics in the privacy of his office.

A Rehabilitation Program for Alcoholic Men. Sacred Heart Center for Men (Detroit) operates a half-way house for alcoholic men. The program director did all of the interviewing after

he was trained in the procedure. Interviews were conducted in his private office at the center. All of the respondents operated a motor vehicle regularly and had a drinking problem. Twenty-six persons participated.

An Out-Patient Program for Employed Alcoholics. The Salvation Army in Detroit operates an out-patient program, which provides counseling, medical, and psychiatric care to employed alcoholics. The program director interviewed ten of these individuals. The interviewing again was done only by the director after being briefed on the procedure, and a trial interview was conducted.

A Probation and Parolee Alcohol Counseling Program. The Monroe County Court Probation Department regularly offers counseling to alcoholic offenders. Several of these offenders were interviewed after they had volunteered for alcohol counseling.

The interviewer was the Chief County Probation Officer of the 38th Judicial Circuit, Monroe, Michigan. He was briefed on the procedure and given a trial interview. He then conducted the interviews with twenty persons.

Health Department. The Toledo Health Department administered the Questionnaire and Interview to 16 persons.

In conclusion, most of the subjects were cooperative. The agencies expressed a concern about the request for names. One refused to cooperate on this basis. Most of the interviewers were paraprofessionals, and very experienced at their jobs.

RESULTS

ANALYSIS OF INTERVIEW AND QUESTIONNAIRE DATA

Analysis of the data was carried out on the University of Michigan IBM-360/67 computing system. Programs employed in the analysis were furnished by: The HSRI Computer Services Department, which maintains a group of programs known as the HSRI Statistical

Research System; the University of Michigan Statistical Research Laboratory; and the University of Michigan Computing Center.

CODING OF RESPONSES. Responses to the Questionnaire items were of two types. Most of the items in the Questionnaire called for a yes/no response. Subjects were given the option of indicating that a question was not applicable to them. Also, about half the control subjects were asked to indicate if the question was "objectionable" to them for any reason, e.g., invasion of privacy or morality. Therefore, on these questions four response options existed: "yes," "no," "not applicable," and "no response." Each of these options was assigned a unique code in keypunching, but in initial item analyses only the "yes" and "no" responses were considered. Several of the items were to be answered by the respondent stating a number. In these cases, the keypunch operator punched the number directly into the card. Two codes outside the expected range of the data were reserved for the "not applicable" and "missing" categories.

Coding of the Interview items was somewhat more complex, as many of the questions called for open-ended responses. The items calling for "yes/no" responses were coded in the same manner as the similar items on the Questionnaire. The same holds true for those items which were answerable by stating a number (e.g., the number of times a given event had occurred). Open-ended responses were punched only in those cases in which they could clearly be separated into a relatively small number of useful categories. In such cases, each category was assigned a unique number and the number assigned was entered by the keypuncher. Many of the Interview items also called for a multiple choice type of response by the interviewer. In such cases, the response options were numbered and the interview was asked to enter the number of the appropriate response. This number was punched directly by the keypuncher. As the interviewer was instructed to answer all

items, there were no missing data on the Interview, but separate codes were reserved for cases in which the question was not applicable to the respondent and for cases in which the respondent refused to respond. Such refusals were quite infrequent, but the "not applicable" category was frequently used, since many of the questions were asked only if a previous question had been answered in a specified direction. Not applicable responses and refusals were not counted in the initial item analyses.

ITEM ANALYSIS. The yes/no items on the Questionnaire were analyzed by means of chi-square tests. An item was retained if the responses of the control group and the problem-drinking group differed at or beyond the .001 significance level. For those items permitting more than two response categories, a different procedure was followed. The initial step was the construction of a bivariate frequency table showing the relationship between the item response and criterion group membership. These tables were then inspected to determine what further analyses would be carried out on that item. For those items on which the responses reasonably approximated a normal distribution, point-biserial r's were calculated between item response and criterion group membership. For items having markedly skewed or bimodal distributions, the responses were grouped in whatever fashion produced the greatest degree of discrimination between criterion groups and the results were tested for significance using either chi-square tests or point-biserial r's, depending on the number of categories involved.

TEST VALIDITY. A double cross-validation technique (Guilford, 1954) was used in validating the items and constructing the final scoring key. The total sample was divided into two sub-groups, those having odd serial numbers and those having even serial numbers. Item analysis as outlined above was carried out for each sub-group separately. After the items had been selected and a scoring key constructed using the results of the item analysis from each sub-group, this scoring key was then used to score the responses of the opposite sub-group. The scores thus obtained for each sub-group were then used to determine the level of discrimination of the scale.

In constructing the scoring keys for the two sub-groups, an attempt was made to use the multiple regression technique to arrive at an optimum set of weights for each item. This attempt proved fruitless, because the high intercorrelations between items led to the correlation matrices being singular, and thus there was no unique solution for the multiple regression equations. When the item intercorrelations were inspected it was determined that there was a substantial cluster of items which intercorrelated very highly with each other, and which, although they significantly discriminated between criterion groups, correlated less well with the criterion than with each other. Upon examining the content of these items it was determined that they appeared to measure general neurotic tendencies, free floating anxiety, or similar concepts. These items were then separated out into a separate scale. Thus, there were two scales for the questionnaire responses--one of which is specific to problem drinking, and another which appears to measure general neurotic tendencies. It was then possible to compute three scores for each subject--two questionnaire scores and an interview score. Unit weighting was employed in computing these scores.

Multiple regression analysis of the three scores was then carried out to determine the appropriate weighting for the three scores in computing the overall score. The regression coefficients

are shown in Table 5. In these analyses the dependent variable was criterion group membership. For the even-numbered subjects the regression coefficients, in raw-score units, were 0.016 for the first Questionnaire score, -0.007 for the second Questionnaire score (the one measuring general neuroticism), and 0.026 for the Interview score. For the odd-numbered subjects, the corresponding regression coefficients were 0.009, -0.007, and 0.031. The multiple correlation coefficient in each case was 0.92.

TABLE 5. Regression Coefficients for Subscale Scores Using Criterion Group as Dependent Variable, Computed Separately for Subjects With Even and Odd Serial Numbers.

	EVEN	
Variable	Regression Coefficient β	Regression Coefficient B (Raw Score Units)
Questionnaire Score 1	0.3250	0.01558
Questionnaire Score 2	-0.1056	-0.00703
Interview Score	0.6963	0.02577

	ODD	
Variable	Regression Coefficient β	Regression Coefficient B (Raw Score Units)
Questionnaire Score 1	0.1869	0.00898
Questionnaire Score 2	-0.1204	-0.00703
Interview Score	0.8299	0.03107

TEST WEIGHTINGS. It was decided to use a simplified, compromise, weighting scheme. The first Questionnaire score was assigned a relative weight of 2, the second Questionnaire score was assigned a relative weight of -1, and the Interview score was assigned a relative weight of 4. The negative weighting coefficient for the second Questionnaire score shows that it is functioning as a suppressor variable. It appears to be a correction for the general tendency of the individual to endorse items indicative of maladjustment.

FINAL SCORING KEYS. The scoring keys and weightings developed in the previous steps were used to score the responses of the validation samples. The key developed using the odd-numbered subjects was used to score the responses of the even-numbered subjects and vice versa. Three scores were derived for each individual: Questionnaire, Interview, and total. The means and standard deviations of these scores for the various sub-groups are summarized in Table 6. The point-biserial correlation coefficient between total score and criterion group membership was 0.921 for the even-numbered group and 0.919 for the odd-numbered group. The discriminative ability of the scale for each group is shown in Figures 1 and 2. These show that in both cases it is possible to correctly classify all of the problem drinker subjects while classifying only about 6%, or less, of the control subjects as problem drinkers, a most encouraging level of discrimination.

The item analysis using the even-numbered subjects yielded 43 significant items on the first Questionnaire scale, 29 significant items on the second Questionnaire scale, and 54 significant Interview items. For the odd-numbered subjects there were 46, 26, and 52 significant items, respectively, on the two Questionnaire scales and the Interview. In no case did an item which discriminated at 0.001 significance level on one such sample fail to discriminate at least at the 0.05 level for the

TABLE 6. Means and Standard Deviations for Questionnaire, Interview, and Total Scores for Scales Derived in Double Cross-Validati

QUESTIONNAIRE SCORE

	Alcoholic			Control		
	N	$\bar{X}$	SD	N	$\bar{X}$	SD
Subjects With Even Serial Numbers	96	35.71	8.65	148	9.31	7.20
Subjects With Odd Serial Numbers	96	31.11	9.92	149	6.62	7.06

INTERVIEW SCORE

	Alcoholic			Control		
	N	$\bar{X}$	SD	N	$\bar{X}$	SD
Subjects With Even Serial Numbers	96	119.04	27.01	148	20.22	16.99
Subjects With Odd Serial Numbers	96	118.02	27.76	149	19.92	14.66

TOTAL SCORE

	Alcoholic			Control		
	N	$\bar{X}$	SD	N	$\bar{X}$	SD
Subjects With Even Serial Numbers	96	154.75	31.93	148	29.53	21.38
Subjects With Odd Serial Numbers	96	149.14	32.96	149	26.54	19.37

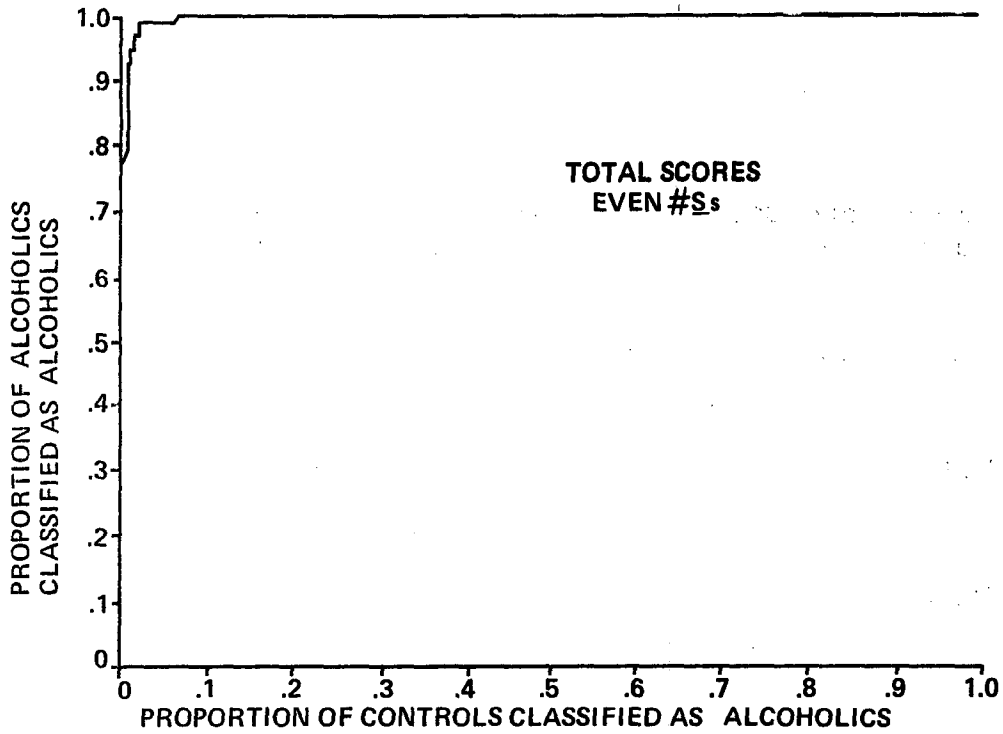

Figure 1. Discrimination of total scores (Questionnaire and Interview) of even-numbered control and alcoholic subjects, using the scoring keys developed from the odd-numbered subjects.

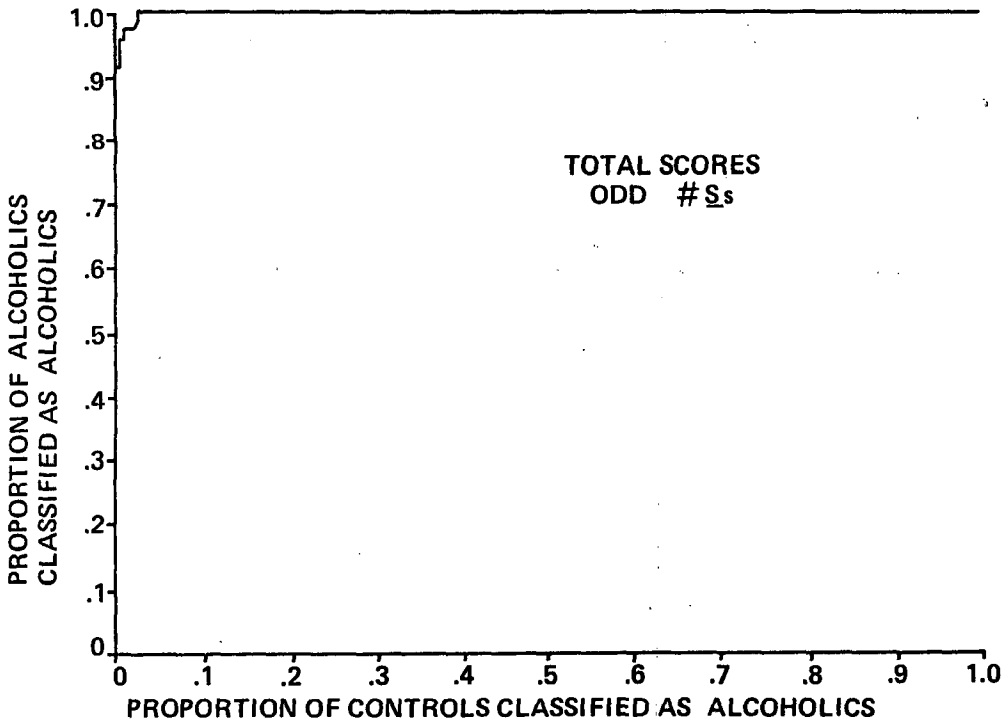

Figure 2. Discrimination of total scores (Questionnaire and Interview) of odd-numbered control and alcoholic subjects, using the scoring keys developed from the even-numbered subjects.

other sub-sample. Thirty-six items on the first Questionnaire scale, 18 items on the second Questionnaire scale, and 52 Interview items were common to the keys derived from both sub-samples. In view of this very substantial agreement between the item analyses performed on the two sub-samples, it was decided that the final scales should consist of these common items.

FINAL TEST BATTERY VALIDITY. The responses of the entire sample were then scored using the final keys based upon the common items, and using the same weighting as was used in the previous step, i.e., Questionnaire scale 1 score x 2, Questionnaire scale 2 score x 1, and Interview score x 4. Means and standard deviations for the three scores were computed for the total sample for each criterion group, both overall and separately for each sex. These results are summarized in Table 7. The means and standard

TABLE 7. Means and Standard Deviations for Questionnaire, Interview, and Total Scores.

	QUESTIONNAIRE SCORES					
	Alcoholic			Control		
	N	$\bar{X}$	SD	N	$\bar{X}$	SD
All Subjects	192	30.70	8.37	297	7.00	6.34
Males	173	30.87	8.35	159	8.36	6.87
Females	19	29.21	8.63	138	5.44	5.29

	INTERVIEW SCORES					
	Alcoholic			Control		
	N	$\bar{X}$	SD	N	$\bar{X}$	SD
All Subjects	192	118.12	27.23	297	19.45	15.93
Males	173	118.36	28.16	159	22.04	17.05
Females	19	116.00	16.87	138	16.46	14.01

	TOTAL SCORES					
	Alcoholic			Control		
	N	$\bar{X}$	SD	N	$\bar{X}$	SD
All Subjects	192	148.83	31.65	297	26.45	19.91
Males	173	149.23	32.54	159	30.40	21.67
Females	19	145.21	22.29	138	21.91	16.63

deviations for each criterion group were computed within each age group, and are shown in Table 8. The means for alcoholics and for controls exhibit an encouraging degree of stability across sex and age, although the separation between the groups is obviously less marked at the lowest age level.

TABLE 8. Means and Standard Deviations of Total Scores by Age of Criterion Groups.

	TOTAL SCORES					
	Alcoholic			Control		
Age	N	$\bar{X}$	SD	N	$\bar{X}$	SD
16-25	15	128.67	36.79	128	29.87	21.20
26-35	56	153.80	28.19	69	23.57	19.14
36-45	68	154.96	27.31	49	24.24	17.77
46-55	31	146.23	30.48	36	24.31	19.91
56-65	16	141.75	29.80	8	27.00	15.36
65+	4	113.25	25.40	6	19.83	18.32

The point-biserial correlation coefficients between the scores and criterion group membership, which indicate the concurrent validity of the tests, are as follows: 0.849 for the Questionnaire, 0.917 for the Interview, and 0.921 for the Total Score (Table 9). For the Questionnaire score the correlation coeffi-

TABLE 9. Point-Biserial Correlation Coefficients for Questionnaire, Interview, and Total Scores With Criterion Group Membership Using the Final Key.

SCALE	r_{pbi}
Questionnaire	0.849
Interview	0.917
Total	0.921

cient was 0.826 for males and 0.801 for females; for the Interview score it was 0.899 for males and 0.914 for females; for the total score it was 0.905 for males and 0.918 for females (Table 10).

TABLE 10. Point-Biserial Correlation Coefficients for Questionnaire, Interview, and Total Scores With Criterion Group Membership by Sex, Using the Final Key.

SCALE	r_{pbi}
Questionnaire - Male	0.826
Questionnaire - Female	0.801
Interview - Male	0.899
Interview - Female	0.914
Total Score - Male	0.905
Total Score - Female	0.918

The distributions of the total scores for control and alcoholics is shown in Figure 3, using the final Scoring Key. The overlap between the scores of the two groups is small, showing the good discriminative capability of the test battery.

Figures 4 and 5 show the total score distributions for male and female controls and alcoholics. There is no overlap of control and alcoholic female scores, but the female alcoholic sample size was relatively small. Inspection of the means, standard deviations, and distributions for males and females revealed that it was not, as originally supposed, necessary to use different scoring criteria or perform separate analyses for males and females. It was concluded that the use of the suppressor variable previously mentioned compensates for the tendency of females to endorse more items indicative of maladjustment, which was observed in previous versions of the Questionnaire.

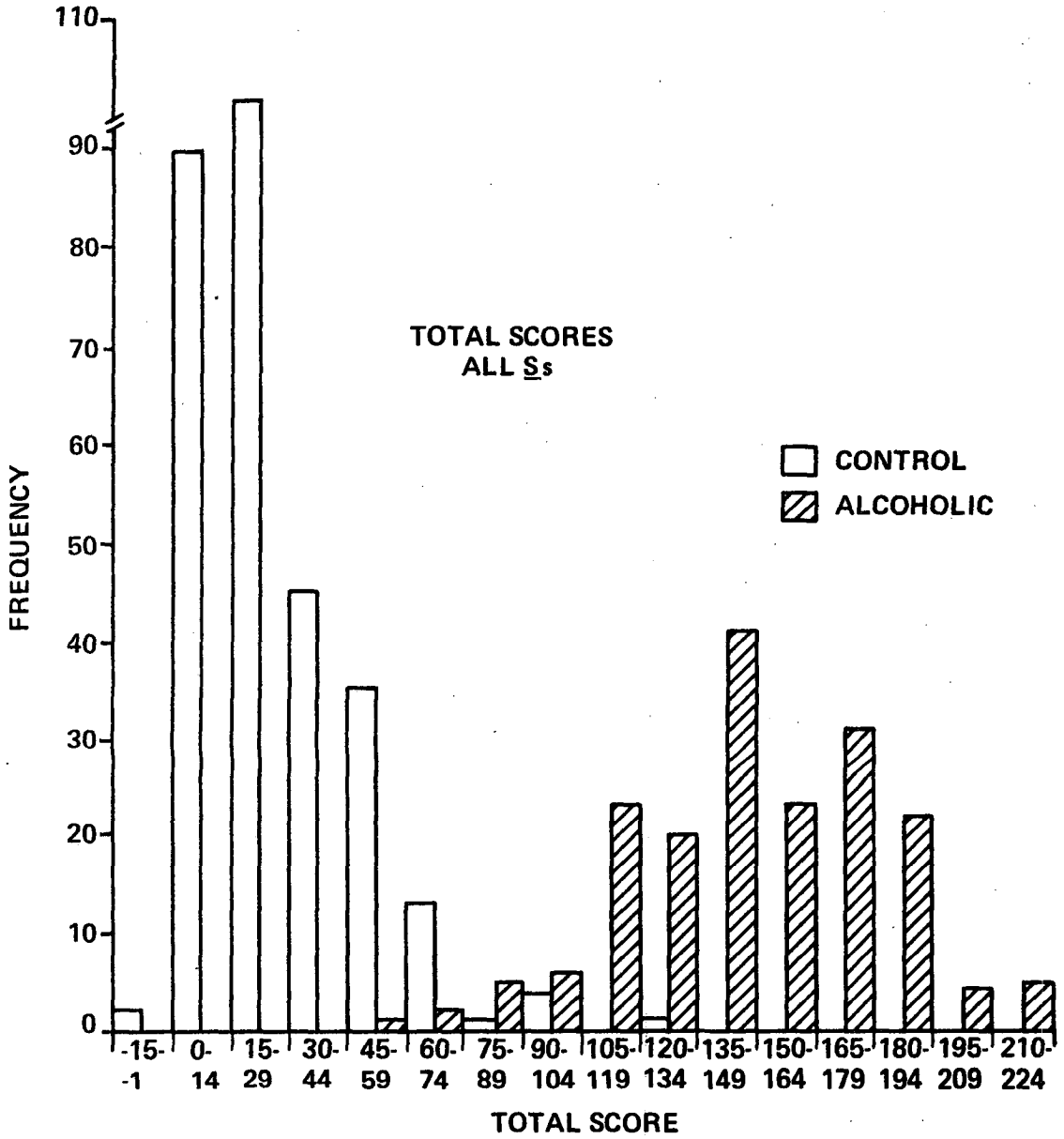

Figure 3. Distribution of total scores (Questionnaire and Interview) for control and alcoholic subjects.

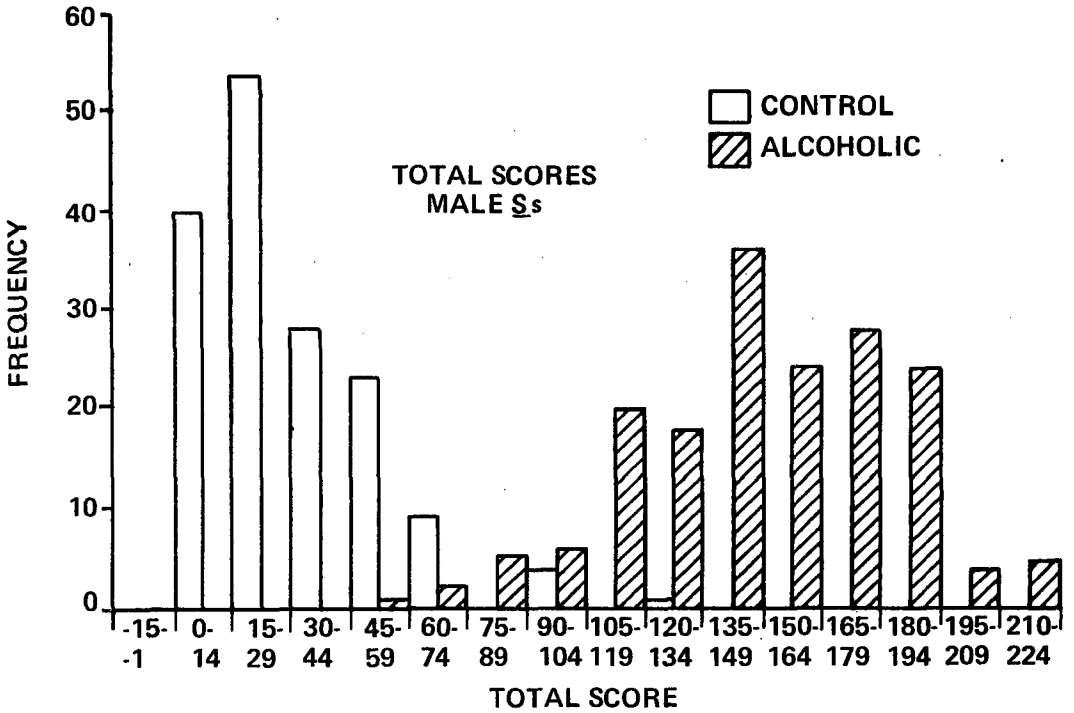

Figure 4. Distribution of total scores (Questionnaire and Interview) for male control and alcoholic subjects.

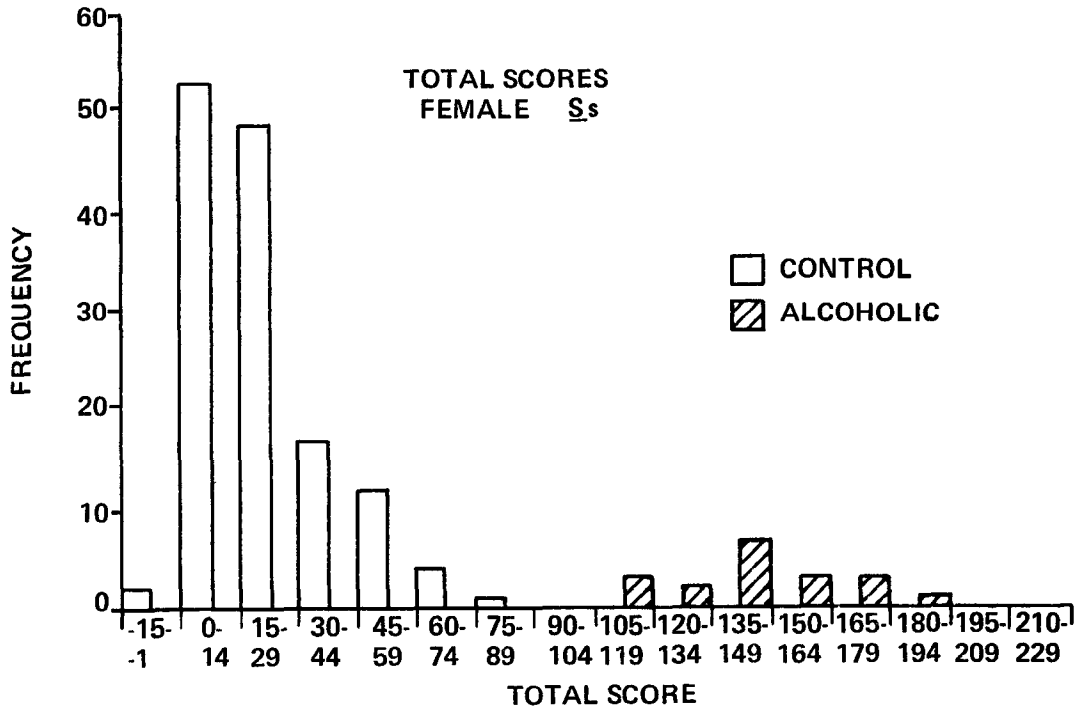

Figure 5. Distribution of total scores (Questionnaire and Interview) for female control and alcoholic subjects.

Figures 6-11 show the total score distributions of the controls and alcoholics by age categories.

Figures 12 and 13 show the distributions of scores of the controls and alcoholics on the Questionnaire and Interview, respectively. It will be noted that there is less overlap in group scores on the Interview than the Questionnaire, which reflects the slightly higher validity of the Interview.

The discriminative ability of the scales is shown in Figures 14-18. Figure 14 shows the discrimination power of total scores in terms of the proportion of alcoholics correctly identified compared to the proportion of controls misclassified as alcoholics. For example, Figure 14 shows that about 75% of alcoholics are correctly identified with none of the controls misclassified. If a false positive rate of about 1% is accepted, meaning that about 1% of the controls will be misclassified as alcoholics, then about 91% of the alcoholics would be identified. All of the alcoholics would be identified if a false positive rate of 7% were acceptable.

The proportion of alcoholics that are correctly identified and the proportion of controls that are consequently misclassified can be determined by the cut-off scores that are selected for placing a testee in the alcoholic or nonalcoholic category. The proportions shown in Figure 14 were derived from the data in Figure 3.

Similarly, Figures 15 and 16 show the test battery's discrimination between the controls and alcoholics among the males and females, respectively. The better discrimination among female controls and alcoholics than males was also found in a previous study (Mortimer and Lower, 1970).

Figures 17 and 18 show the discrimination between controls and alcoholics provided by the Questionnaire and Interview, respectively, if used alone. The Questionnaire developed in this

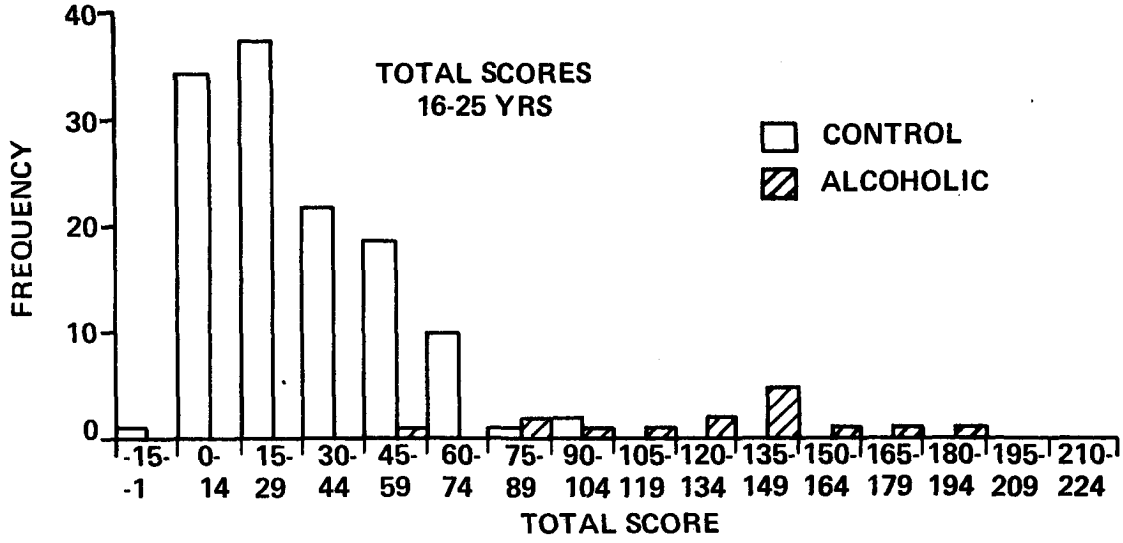

Figure 6. Distribution of total scores (Questionnaire and Interview) for control and alcoholic subjects, 16-25 years of age.

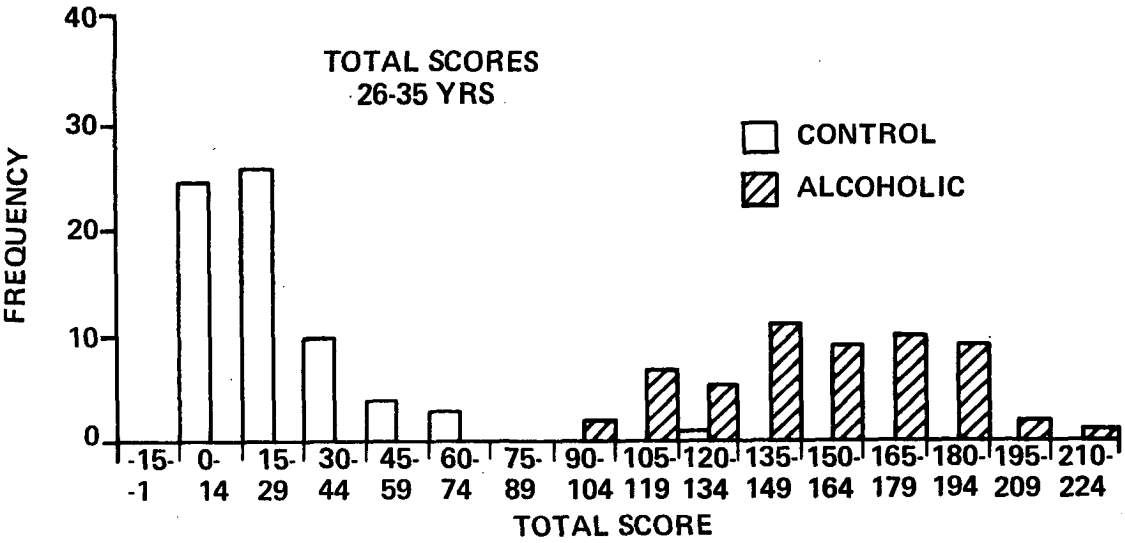

Figure 7. Distribution of total scores (Questionnaire and Interview) for control and alcoholic subjects, 26-35 years of age.

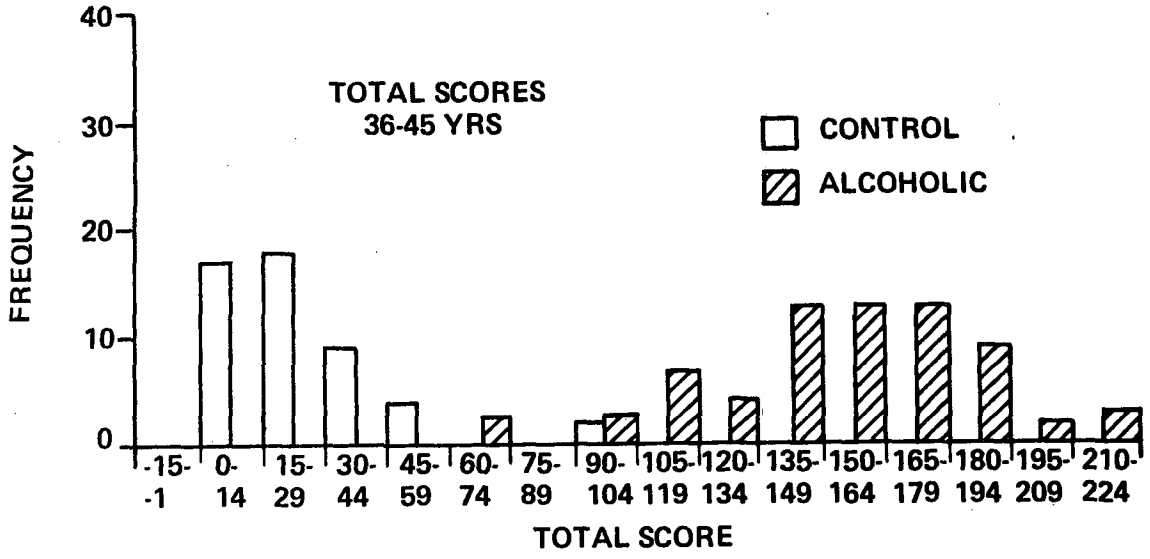

Figure 8. Distribution of total scores (Questionnaire and Interview) for control and alcoholic subjects, 36-45 years of age.

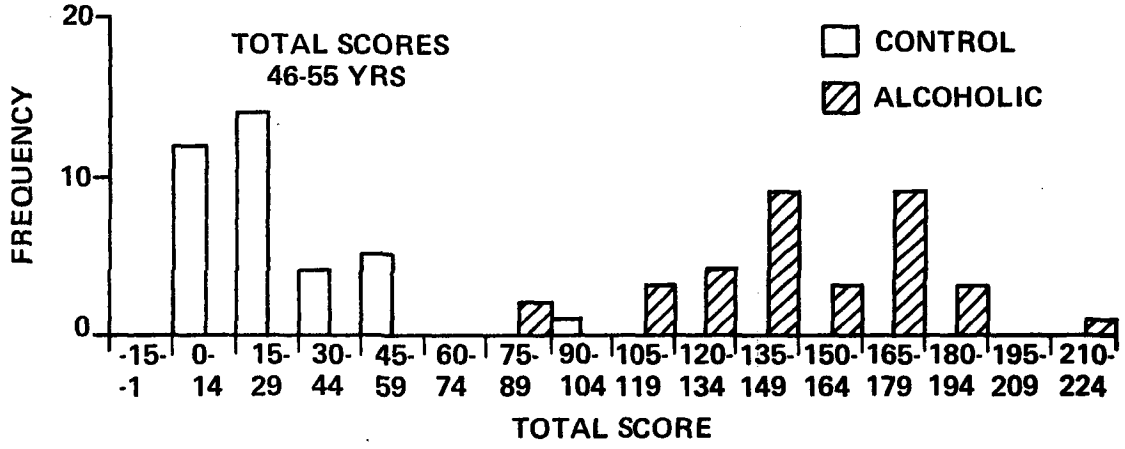

Figure 9. Distribution of total scores (Questionnaire and Interview) for control and alcoholic subjects, 46-55 years of age.

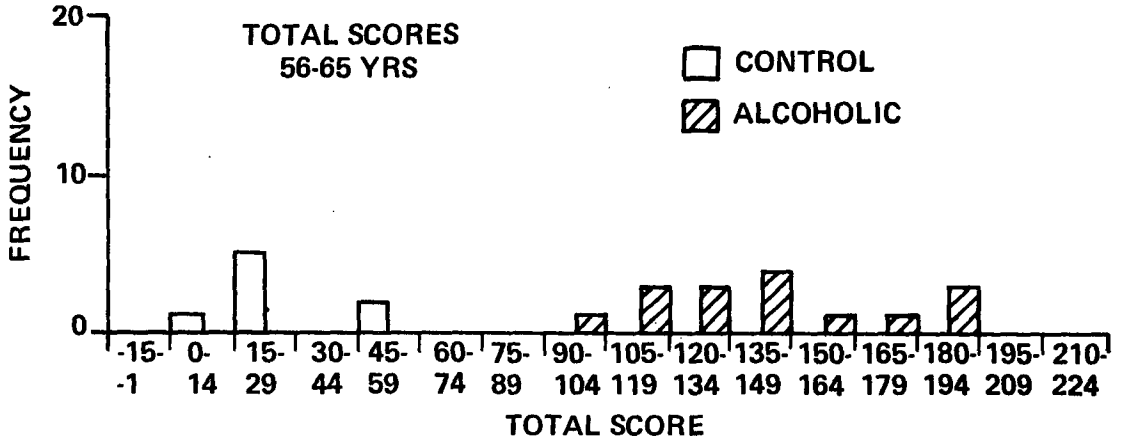

Figure 10. Distribution of total scores (Questionnaire and Interview) for control and alcoholic subjects, 56-65 years of age.

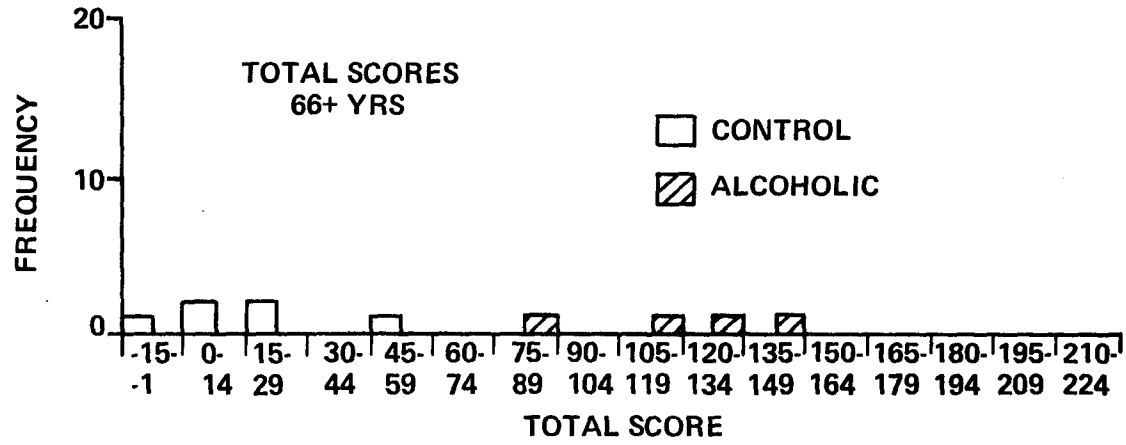

Figure 11. Distribution of total scores (Questionnaire and Interview) for control and alcoholic subjects, over 66 years of age.

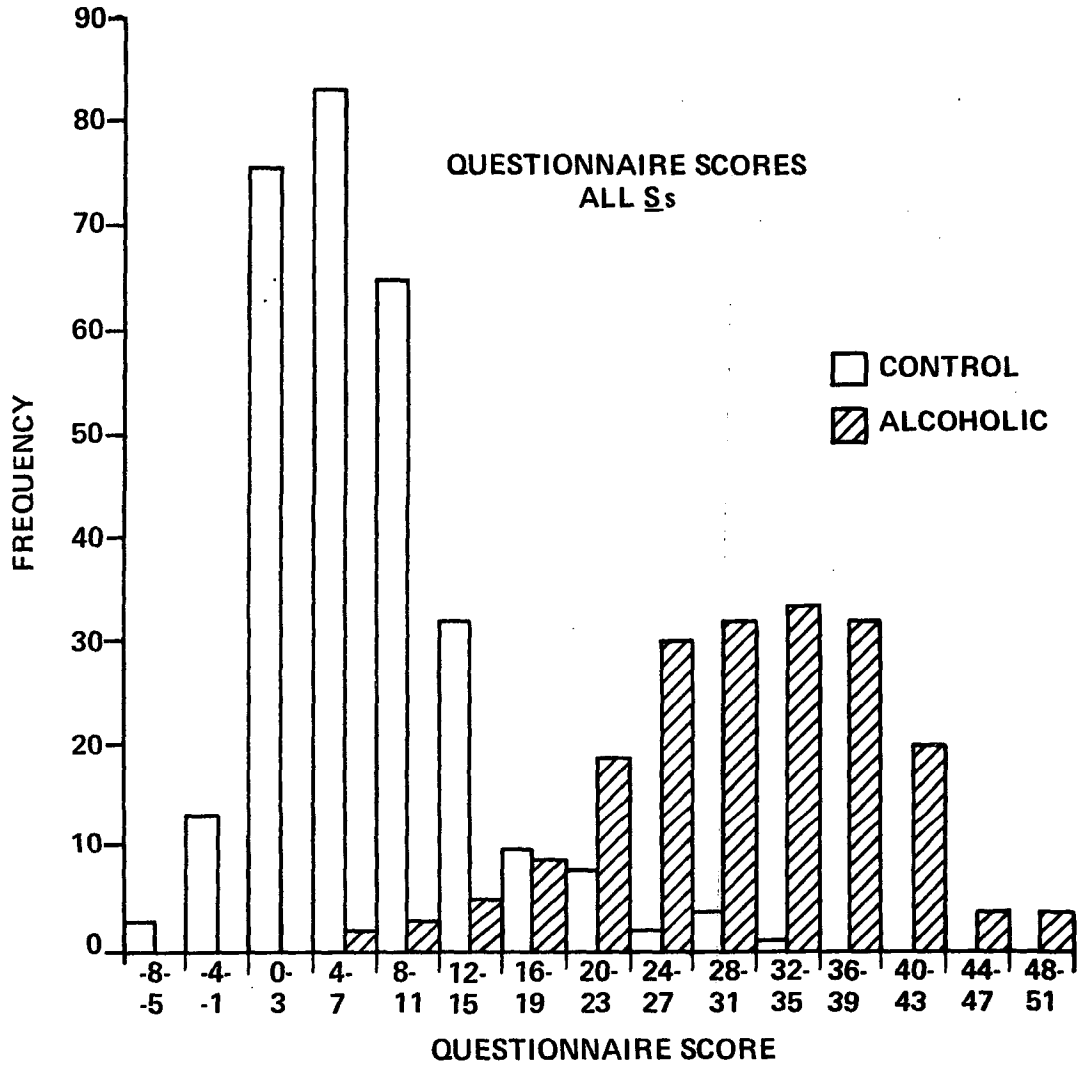

Figure 12. Distribution of Questionnaire scores for control and alcoholic subjects.

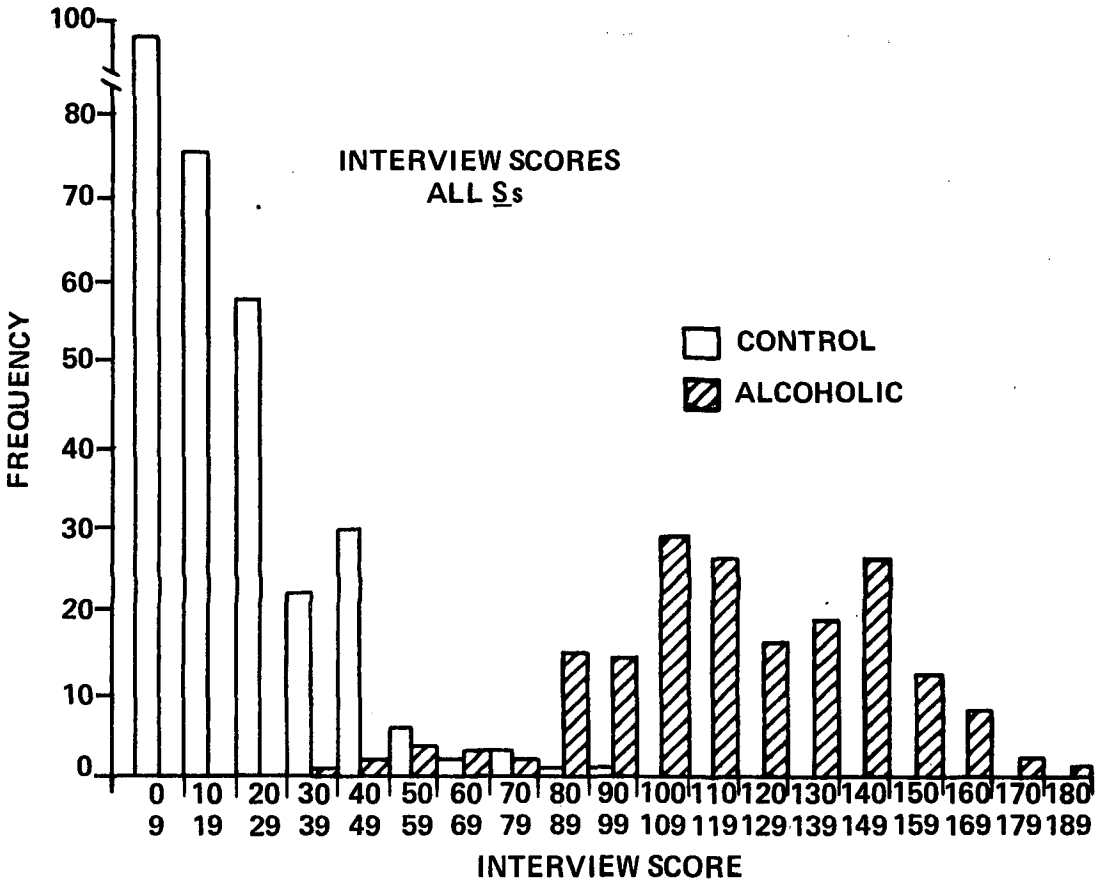

Figure 13. Distribution of Interview scores for control and alcoholic subjects.

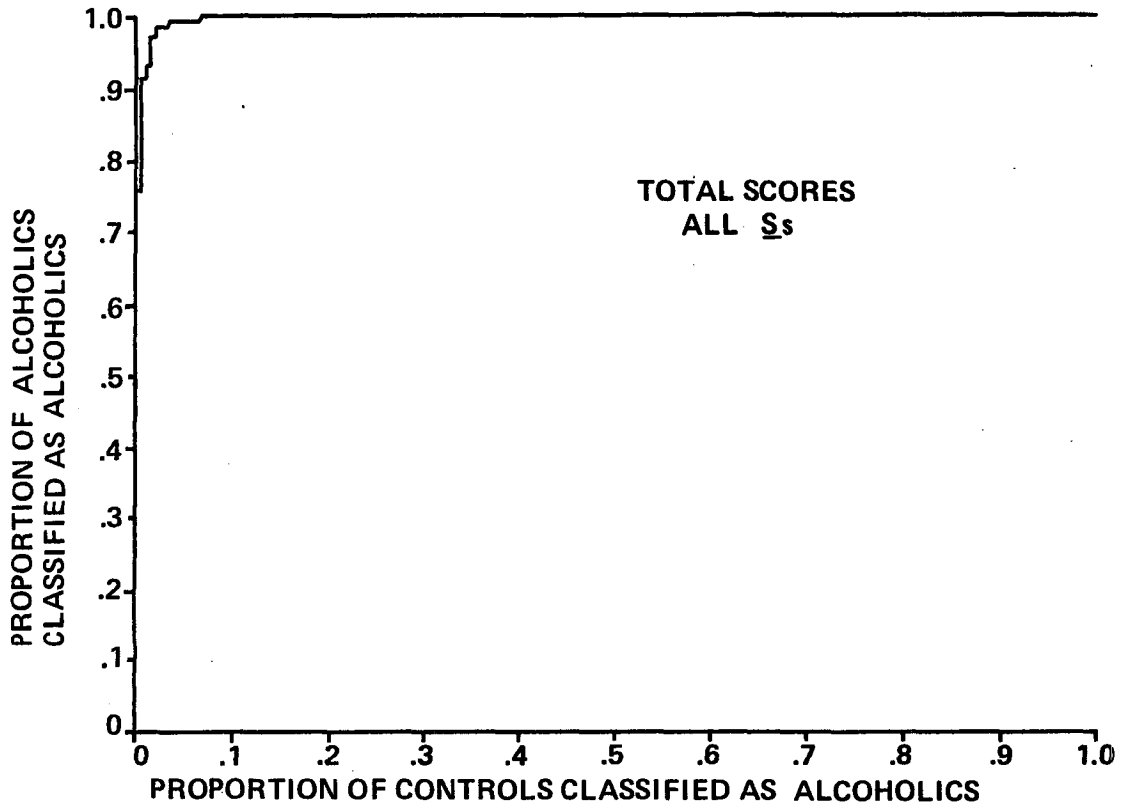

Figure 14. Discrimination of total scores (Questionnaire and Interview) between controls and alcoholics. The graph shows the proportion of alcoholics correctly identified as a function of the proportion of controls misclassified as alcoholics.

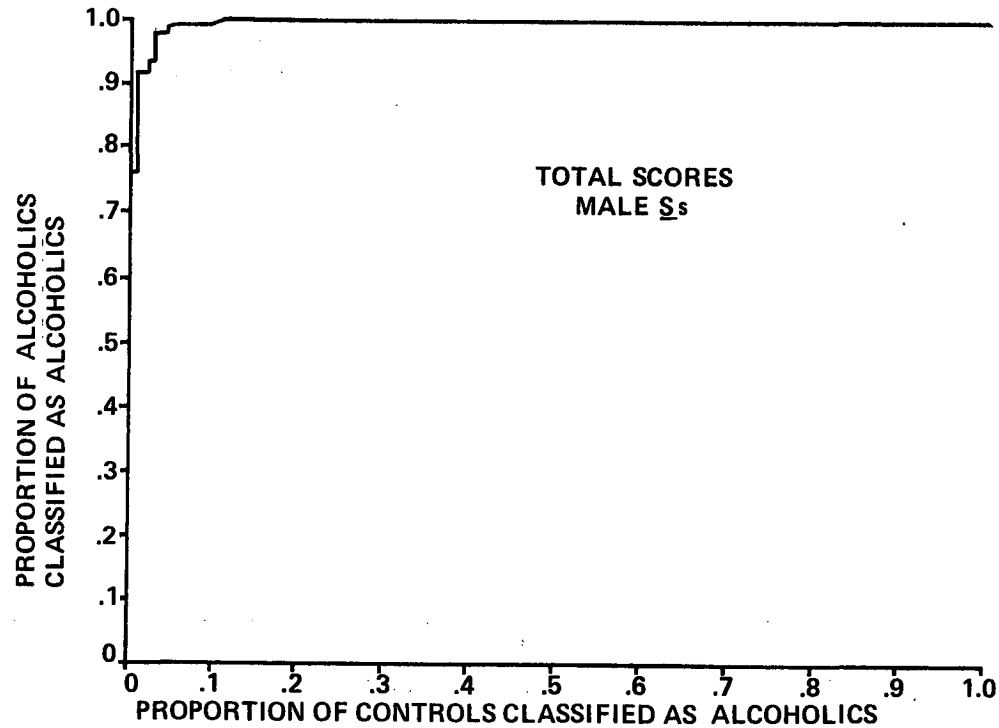

Figure 15. Discrimination of total scores (Questionnaire and Interview) between male controls and alcoholics.

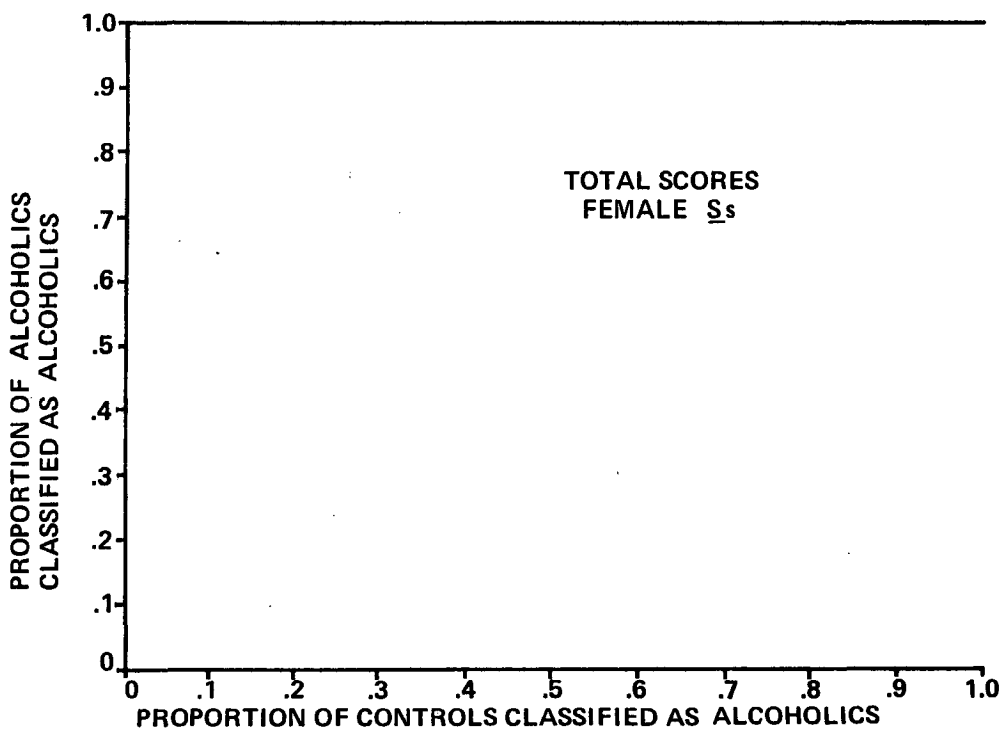

Figure 16. Discrimination of total scores (Questionnaire and Interview) between female controls and alcoholics.

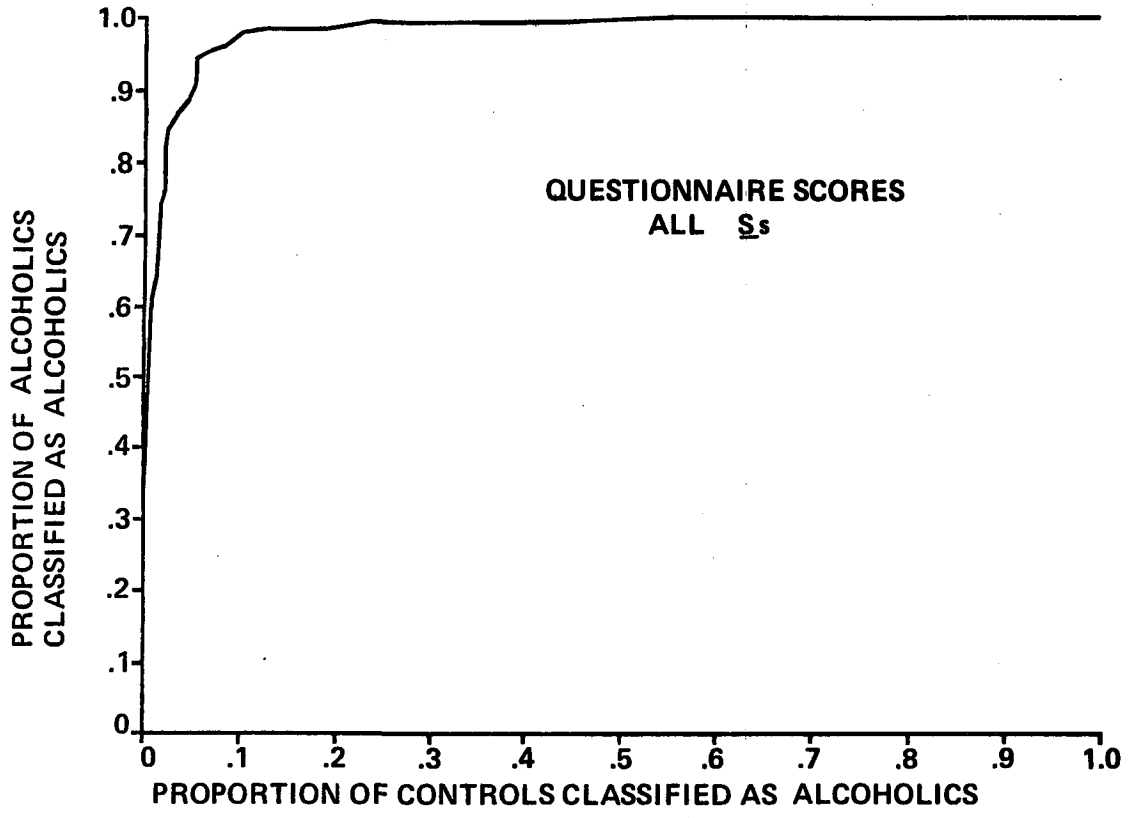

Figure 17. Discrimination of the Questionnaire between controls and alcoholics.

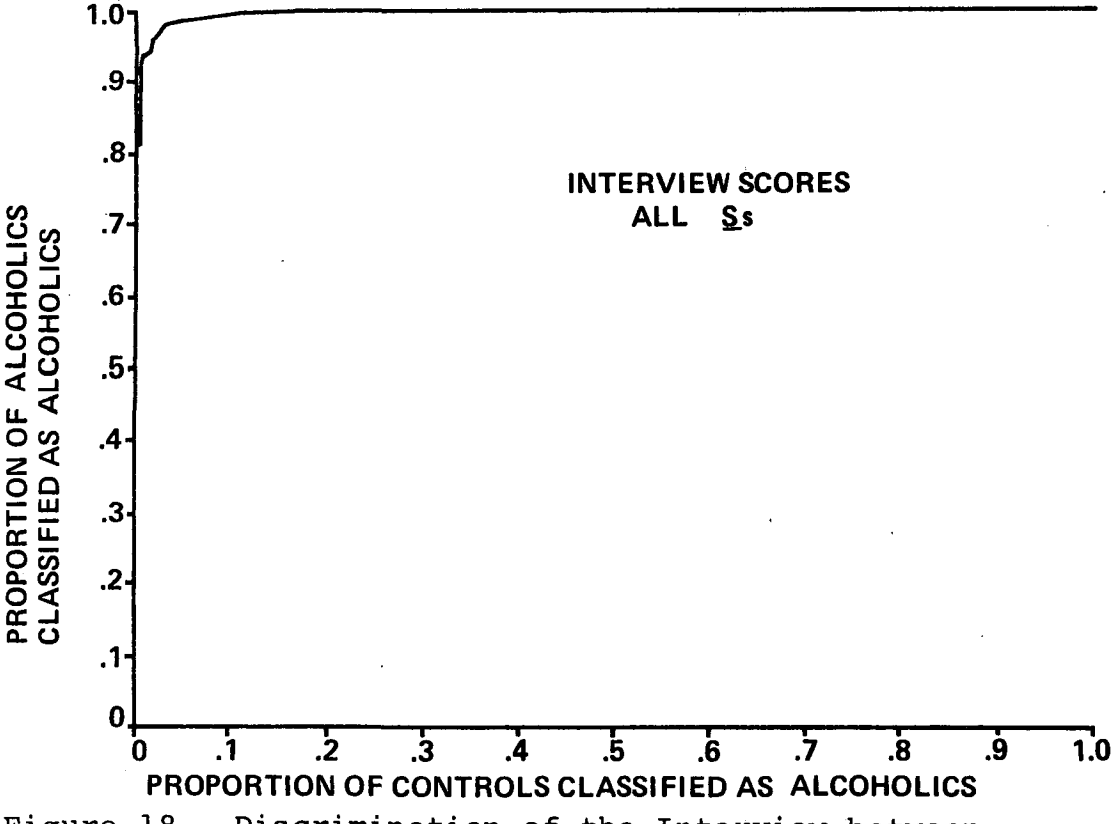

Figure 18. Discrimination of the Interview between controls and alcoholics.

study is an extension of one developed earlier (Mortimer and Lower, 1970). It is of interest to note that this new instrument provides a worthwhile improvement in discrimination between controls and alcoholics.

FINAL TEST BATTERY RELIABILITY. As a check on the reliability of the various sections of the protocol (using reliability in the sense of internal consistency), each section was split into two equivalent forms. The items were sorted into pairs in which both members dealt with essentially similar areas of behavior or history. One member of each pair was then assigned to each of the forms. Half of the items assigned to each form were items asked first in their respective pairs in the full-length protocol, the remaining ones being the second-asked items of their pairs. The responses of the validation groups were then rescored using the keys for these two forms so that for each individual two scores, one for each of the "equivalent" forms, were obtained for the following measures: scale 1 and scale 2 of the Questionnaire, overall Questionnaire score, Interview score, and total score. The overall Questionnaire, Interview, and total scores were computed in the same manner as for the full-length versions.

Correlation coefficients between the two forms were then computed for each of the above measures. The obtained values were as follows: Questionnaire scale 1, 0.897, Questionnaire scale 2, 0.887; Questionnaire overall, 0.825; Interview, 0.948; and total score, 0.954.

The Spearman-Brown prophecy formula was then employed to obtain corrected split-half reliability coefficients for the full-length scales. These were as follows: Questionnaire scale 1, 0.946; Questionnaire scale 2, 0.940; Questionnaire overall, 0.904; Interview, 0.973; and total score, 0.976.

SELECTION OF CUT-OFF SCORES. Cut-off scores are recommended that allow an individual to be classified in one of three categories: (1) problem drinking, (2) presumptive problem drinking, and (3) nonproblem drinking.

1. Problem Drinking. A total score of 85 or above is considered as evidence that the individual has a severe drinking problem. Based on the data obtained it would be expected that more than 98.5% of alcoholics will score at or above 85, while less than 1.5% of controls will score as high.

2. Presumptive Problem Drinking. A total score of 60 or greater but less than 85 should be treated as highly presumptive evidence that the individual is a problem drinker. Only 1.5-6.0% of controls are expected to score in the range 60-85, while 99.5% of alcoholics are expected to score above 60. Scores between 60 and 85 are considered to be highly presumptive of problem drinking, since the false positive rate is reasonably low. Persons falling in this total score range should be evaluated further by considering other data, such as their driving record. The BAC at time of arrest, previous DUIL, reckless driving, speeding, and other convictions can provide further supporting evidence. This is particularly true for younger offenders who tend to score somewhat lower than the middle-aged (Table 6).

3. Nonproblem Drinking. A person obtaining a total score of less than 60 should ordinarily not be considered a problem drinker unless there is other strong evidence that points to a drinking problem.

SCORING KEYS AND SCORING METHOD. There are three scoring keys, as already mentioned. There are two scoring keys for the Questionnaire and one for the Interview. These keys and instruction in their use are provided in Volume 3 of the "Manual of Court Procedures for Identifying Problem Drinkers," and are not provided in this report. They will be proposed to be made available to qualified users.

ANALYSIS OF DRIVING RECORDS OF CONTROL AND ALCOHOLIC SAMPLES

The driving records of the control and alcoholic subjects were sought. Although 97% of the driving records for the 297 control subjects were obtained, only 31% of the records for the 192 alcoholics were retrievable. This was because some were out of state or had no driving license, and some of the treatment agencies who administered the Questionnaire and Interview wanted their clients to remain anonymous.

The driving records were scrutinized for the frequency of eleven events that may appear on the record: (1) DUIL/DWI, (2) reckless driving, (3) speeding, (4) no driving license, (5) driving without a license, (6) driving license suspended, (7) driving license cancelled, (8) driving license denied, (9) driving license revoked, (10) number of arrests, (11) number of accidents.

The recorded events cover, at most, a seven year time span, except for DUIL and reckless driving offenses which are not purged each seven years by the Michigan Secretary of State.

Table 11 shows the percent of persons in the alcoholic and control samples having one or more of the indicated events on their driving record. Chi-square tests performed on the frequencies of each event for the alcoholic and control samples showed that they were all significantly different ($P \leq 0.01$) except "driving license cancelled" and "driving license denied."

The data in Table 11 shows that the alcoholics have more accidents, arrests, license and speeding offenses, and are highly over-involved in DUIL and reckless driving offenses.

These indices of driving behavior can, therefore, serve as useful supporting data for the identification of the problem drinker.

TABLE 11. Percent of Alcoholics and Controls Having One or More of the Indicated Events on Their Driving Record.

Event	Alcoholics (N=60) [a]	Controls (N=288) [a]	χ^2 P< 0.01
DUIL/DWI	34	0	✓
Reckless Driving	34	1	✓
Speeding	48	27	✓
No License	10	2	✓
Driving Without License	13	1	✓
Driving License Suspended	10	0	✓
Driving License Cancelled	0	0	NS
Driving License Denied	0	0	NS
Driving License Revoked	5	0	✓
Number of Accidents	63	18	✓
Number of Arrests	83	45	✓

(a) Shows the number for whom driving records were retrievable.

On the other hand, none of the alcoholics or controls had licenses cancelled or denied indicating that these events are insensitive measures of driving behavior.

A check was made on the possibility that the alcoholic subsample of 60 drivers for whom driving records were retrieved differed in age from the overall alcoholic sample or from the controls. The age distribution of the subjects whose driving records were analyzed is shown in Table 12.

TABLE 12. Percent Distribution by Age of Alcoholics and Controls Used in the Driving Record Analysis.

Age	Alcoholics	Controls
16-25	3.3	37.8
26-35	30.0	23.6
36-45	31.7	18.8
46-55	21.7	10.8
56-65	11.7	5.2
Over 66	1.7	3.5

The age distribution of the alcoholics for whom driving records were available is quite similar to the overall alcoholic sample (Table 2). It is, therefore, a somewhat older group than the controls. This could mean that some of the controls had not yet held a driving license for seven years after which time the records are purged and thus their total (driving record) exposure would be less than that of older drivers. This could partly explain the poorer records of the alcoholics.

However, it is also well known that young drivers, 18-24 years of age, are overinvolved in traffic violations and accidents (Pelz and Schuman, 1970) which would tend to counter the potentially lower license exposure of the control group.

Overall, it is doubtful that differences as large as many of these that were obtained could be ascribed to the differences in age distributions of the samples. They are much more likely to be due to underlying behavioral differences between them.

Other studies (Filkins et al., 1970) have also shown that problem drinker groups tend to be overinvolved in DUIL and reckless driving and in other offenses that appear on the driving records, and such data can provide useful supporting information on the basis of which a diagnosis of problem drinking can be more effectively made. This is particularly true in those cases where the individual scores in the presumptive problem drinker range on the Questionnaire and Interview.

TRAFFIC COURT PILOT STUDY

The test procedures that were developed in this study were used in a preliminary study in a local traffic court. Eleven persons were referred to us by the court. Eight had been charged with DUIL, one with DWI, and two with D&D. Six were subsequently convicted of DUIL, three of DWI, and two of D&D.

The Questionnaire and Interview were administered to each person by one of our staff.

Five persons obtained total scores above 85, the suggested cut-off for a problem drinker diagnosis; one person scored 62, just inside the presumptive problem drinker diagnostic category; and the remaining five persons scored less than 60 and were diagnosed as nonproblem drinkers.

It is interesting to note that about half of these drivers were clearly classifiable as problem drinkers and about the other half as nonproblem drinkers. One person scored just within the lower bound of the presumptive problem drinker category. Due to the small sample size used in this preliminary testing it is difficult to estimate the impact of these findings on larger samples. These subjects were, however, rather clearly definable in terms of diagnostic category. If such clear-cut splits are also found in testing larger samples then the diagnosis can probably be made with considerable confidence.

The driving records of these five persons classified as problem drinkers and the five classified as nonproblem drinkers were examined. The total number of offenses of each of these two groups is shown in Table 13.

TABLE 13. Total Number of Various Events in the Driving Records of Court Sample by Diagnosed Group.

	GROUP	
EVENT	Problem Drinker (N=5)	Nonproblem Drinker (N=5)
DUIL	1	0
Reckless Driving	2	2
Speeding	17	8
Driving Without License	0	4
Driving License Suspended	4	2
Driving License Revoked	0	0
Driving License Restricted	2	0
Accidents	15	7

The group of persons diagnosed as problem drinkers had more previous events on their driving records than those classified as nonproblem drinkers. In particular, they had more than twice the number of speeding convictions and accidents.

A check on the age distribution of these two groups (Table 14) showed them to be quite similar.

TABLE 14. Age Distribution of Court Sample By Diagnosed Group.

GROUP	AGES	MEAN AGE
Problem Drinker	23,26,31,36,50	33
Nonproblem Drinker	23,27,41,45,49	37

The remaining individual who scored in the low end of the presumptive problem drinker classification was 30 years of age. His responses to the Questionnaire and Interview were weighted by items indicating self-denunciation. His driving record showed that he had 1 license and 6 speeding violations and 3 accidents. His blood alcohol level determined by Breathalyzer test at the time of arrest was 0.26. He was, therefore, classified as a problem drinker based on the Questionnaire and Interview findings, driving record, and BAC.

The use of the Questionnaire and Interview and supporting data, as necessary, appear to allow problem drinkers to be identified with a good degree of confidence based upon this preliminary study.

Additional use of the test battery and supporting data with court groups of D&D, DWI, and DUIL offenders will help to further determine the operational effectiveness of the procedures developed in this research.

Appendix A

REVIEW OF THE LITERATURE ON MEDICAL TESTS FOR THE DETERMINATION OF PROBLEM DRINKING

Both the acute and chronic uses of alcohol cause basic biological and chemical changes in the body. There has been considerable research interest in these changes lately for the following reasons: An interest in understanding the effects of alcohol in the body, an attempt to find basic differences in the makeup of alcoholics and nonalcoholics and finally an attempt to determine if alcoholics have a different chemical response to alcohol when compared with nonalcoholics. Hopefully, as a result of this research a biochemical test for alcoholism may emerge in the future. Although there is no such test available at this time the current research will be reviewed here in some detail. This is to inform the reader of the areas in which research is presently active and to make known some of the current biochemical findings regarding alcohol and alcoholism. The following biochemical findings will be discussed: (1) Blood chemistry changes with ethanol ingestion, (2) alcohol metabolism, (3) enzymatic studies related to alcohol, and (4) hormonal differences in alcoholics and nonalcoholics.

BLOOD CHEMISTRY CHANGES WITH ETHANOL INGESTION

A number of very predictable blood chemistry changes occur with sustained drinking or with acute high quantity ingestion. The triglycerides rise early (Isselbacher and Greenberger, 1964; Knott and Beard, 1966; Lieber et al., 1962; Wilson and Arky, 1968), frequently to abnormal levels (Gebbie and Prior, 1967), and remain elevated for a period of time. They return rapidly to their predrinking level when alcohol is withdrawn (Gebbie and Prior, 1967; Nestch, 1967; Kallio, 1969); but it has also been observed that they will return to baseline despite continuous

moderate drinking (Rappaport, 1969; Isselbacher and Greenberger, 1964). Whether this elevation is due to increased synthesis of triglycerides (Scheig and Isselbacher, 1965) or a decreased utilization of fatty acids (Rappaport, 1969) is not clear. Certainly this transient hyperlipemia is related to the fatty infiltration of the liver (Wilson and Arky, 1968). In a similar fashion cholesterol has been observed to rise with alcohol ingestion but it tends to remain elevated throughout the drinking period (Gebbie and Prior, 1967; Nestch, 1967; Rappaport, 1969; Kallio, 1969). Uric acid alterations follow a pattern similar to the triglycerides, showing an initial rise and then fall (Gebbie and Prior, 1967; Rappaport, 1969). Saker et al. (1967) found positive correlations between uric acid levels, the presence of gout, and beer consumption. When they compared nongouty drinkers and nongouty abstainers they found that the uric acid levels were significantly lower for the abstainers. It has long been known that attacks of gout frequently are precipitated by the ingestion of large quantities of malt liquor in middle aged men. Since there is a familiar tendency to develop gout, the exact relationship to ethanol is not known (Anderson, 1966).

The liver enzymes, SGPT and in particular SGOT, are frequently elevated following a drinking bout in persons whose livers function normally. The SGOT and SGPT are enzymes found within the liver cells and their presence in the blood in elevated quantities is taken to mean that the liver cells have undergone injury or death. Currently, the question of a direct toxic effect of alcohol upon the liver is a matter of active debate. The evidence is sparse and at times rather contradictory. Rappaport (1969) and Bang et al. (1958) found that alcohol, in moderate quantities, given to healthy nonalcoholic subjects caused no abnormality in the SGOT level. However, when Bang et al. (1958) gave alcohol in quantities sufficient to raise the blood alcohol concentrations between 0.158% and 0.216%, he found

that 27 of the 35 alcoholics tested had SGOT values beyond normal limits. In patients recovering from prolonged alcoholic bouts a single small dose of alcohol was shown to be capable of causing an abrupt rise in serum SGOT and SGPT. After two weeks or more on a good diet the same patients no longer showed a rise in the enzymes with the same doses of alcohol (Bang et al., 1958; Madsen, et al., 1959). These findings suggest that small doses of alcohol in healthy, well nourished subjects are not hepatotoxic (Kalant, 1961). However, with sustained alcohol intake or large quantity insult, ethanol may be directly hepatotoxic. The liver enzymes, therefore, are meaningful only in determining current liver damage and are poorly associated with previous alcohol abuse.

An isolated finding of curious interest was reported by Kamner and Dupong (1969). They noted that when the blood urea nitrogen was below 10 mg per 100 ml there was likely to be an alcoholic problem. This observation was made on a large number of employees reported to company health officials for review regarding a possible alcohol problem. The authors give no theoretical explanation for this finding.

The elevation of triglycerides, cholesterol, uric acid, SGOT and SGPT and the low serum urea nitrogen give considerable insight into the biochemical and physiologic effects of ethanol ingestion but offer little in the way of identification of problem drinking because (1) the magnitude of change is small and would therefore require baseline data to be meaningful, (2) the changes occur in both controls and alcoholics and (3) the alterations are transient returning to normal after short periods of abstinence.

ALCOHOL METABOLISM IN ALCOHOLICS AND NONALCOHOLICS

The earliest studies measuring the rate of alcohol metabolism seemed to indicate that chronic heavy alcohol ingestion

altered the rate of alcohol metabolism. Many of these studies were poorly designed and their techniques inadequate. More recent studies have indicated that the rate of ethanol metabolism in alcoholics and nonalcoholics is not significantly different (Mendelson, 1968; Harger and Hulpieu, 1956; and Jacobson, 1952). Mendelson used ^{14}C-labeled ethanol and measured the output of ^{14}C carbon dioxide, a reliable method for determining ethanol metabolism. Both his alcoholic and nonalcoholic subjects had been abstinent for a period of three weeks prior to the experimental procedures. Unfortunately he used only four subjects in each group. In another experiment Mendelson et al. (1966) measured the metabolic rate following a 14-day drinking phase in four alcoholic and four nonalcoholic subjects. All showed some change in their metabolic rate following the prolonged drinking episode. Five (two alcoholics and three nonalcoholics) demonstrated an increased rate, while three (two alcoholics and one nonalcoholic) decreased their metabolic rate. These data taken together indicate that neither basal metabolic rates nor rates following alcohol priming give reliable or predictive information about the individual's previous drinking behavior.

ENZYMATIC STUDIES RELATED TO ALCOHOL

Considerable research effort has been directed toward finding enzymatic differences between the alcoholic and social drinker but to date no meaningful difference has been established. Alcohol dehydrogenase (ADH) is the principal enzyme in the metabolism of ethanol, converting ethanol to acetaldehyde (White, 1964). An atypical form of this enzyme has been identified and a few persons, who possess this atypical form almost exclusively, have been studied (Edwards, 1967). Unfortunately the number is small and no firm conclusions can be drawn, but there appears to be no significant difference in the overall metabolism using the atypical form versus the more common form.

Ugarte (1967) measured the ADH activity in moderate drinkers, alcoholics without liver damage and in alcoholics with liver damage and found that the activity was significantly lower in the alcoholics, regardless of the presence or absence of liver damage. This finding would be very meaningful if, in fact, the rate limiting step in ethanol metabolism was dependent upon hepatic ADH activity as originally postulated by Westerfeld (1961). Goldstein (1969) has recently demonstrated that ADH is only half saturated at moderate BACs and not fully saturated at even very high BACs. Since ethanol metabolism follows zero-order kinetics (that is, metabolism proceeds at a constant rate independent of the concentration of ethanol) and the ADH is not saturated, there must be some other rate-limiting factor (Mendelson, 1970). Goldstein (1969) postulates that the factor is the coenzyme NAD in its oxidized form. This is consistent with a number of studies showing a significant decrease in hepatic NAD/NADH ratio with metabolism of ethanol (Raiha, 1962; Smith, 1959).

Following this line of reasoning Rappaport (1969) postulated that exogenous administration of NAD might speed the metabolism of ethanol and decrease the accumulation of metabolic products. This, in turn, might decrease the toxic biochemical changes producing physiological and neurophysiological impairment. His results, however, indicated that the blood chemistry changes previously discussed were unchanged with the administration of NAD prior to and during alcohol ingestion.

A number of drugs, such as barbituates, have been shown to induce hepatic enzymatic changes leading to their more rapid metabolism. These induced changes have been used to explain the tolerance to these drugs. By tolerance is meant the observation that increased dosage over time must be used to give effects obtained with the original dose. Without question, prolonged heavy alcohol intake results in tolerance to alcohol

(Mendelson, 1970). Considerable effort has been employed to isolate an induced enzymatic change to account for this. Lieber and DeCarli (1968) isolated one such system, the hepatic microsomal ethanol-oxidizing system. The investigation of this system is still far from complete but it would seem from the data available that the proportion of alcohol metabolized by this system is very small and therefore an increase in this system would not appreciably effect the overall rate of alcohol metabolism (Yephly, 1969). This system does, however, alter the metabolism of other drugs. Kater (1969) showed that an enhanced rate of metabolism of warfarin (anticoagulant), diphenylhydantoin (anticonvulsant) and tolbutamide (hypoglycemic) occurred in heavy drinkers as contrasted with nondrinking subjects. Another enzyme system which has been demonstrated to increase with prolonged alcohol ingestion is the pentobarbital hydroxylase activity (Lieber, 1969). These findings suggest a mechanism for explaining the cross tolerance that alcoholics exhibit for a variety of drugs. However, since other drugs besides alcohol may cause similar changes, a tolerance to any of these drugs (e.g. barbituates) is not diagnostic of a previous heavy use of alcohol.

HORMONAL DIFFERENCES IN ALCOHOLICS AND NONALCOHOLICS

There is a considerable evidence that acute alcohol ingestion profoundly effects the blood level of substances produced in the adrenal gland. The exact mechanisms responsible for the increased circulating levels have not yet been identified nor are all the implications of the increased circulating levels yet known. However, further investigation of the alcohol-adrenal responses may lead to a better understanding of some of the acute and chronic changes induced by alcohol and the phenomena of tolerance and dependence.

Aldosterone, a mineralocorticoid controlling kidney tubular sodium reabsorption, has been shown with prolonged induced intoxi-

cation to have a biphasic secretion curve. During the first few days when the BAC was between 0.10% and 0.14% the aldosterone level was elevated. As the BAC continued to rise to highs of over 0.30% during the next few days the aldosterone secretion fell to normal and remained in the normal range until the BAC began to fall. With the decrease in the blood alcohol, aldosterone again rose returning to normal only with the complete cessation of drinking (Fabre, 1969). This is consistent with the findings (Ogata, 1968) of decreased urinary sodium excretion and increased serum sodium levels in alcoholics during experimentally induced intoxication. Unfortunately these data were only collected on alcoholics and there are no comparison data reported in the literature on aldosterone secretion and sodium retention in the nonalcoholic.

There is considerable information published regarding the effect of alcohol on the catecholamines level. Animal experiments have shown in dogs (Klingman, 1957) cats (Perman, 1960), and rats (VonWartburg, 1961), that there is a marked increase in urinary excretion of epinephrine and norepinephrine following the administration of ethanol. In humans the same observations have been made (Perman, 1958; Garlind et al., 1960; Anton, 1965). With small to moderate dosages of alcohol the catecholamines and their metabolites rose as the BAC increased and then fell to baseline or below as the BAC decreased (Mendelson, 1970). However, when high BACs were achieved in alcoholic subjects during free-choice alcohol consumption the catecholamine levels were observed to increase during the drinking period but remain elevated despite the discontinuance of drinking. The subjects in this experiment experienced withdrawal symptoms following the cessation of drinking and it was observed that the catecholamine levels remained markedly elevated until the remission of the withdrawal symptoms. Many feel that the elevated catecholamines may, in part, account for the symptoms observed during withdrawal. Care-

ful analysis of the major catecholamine catabolites excreted in the urine has demonstrated that acute alcohol ingestion shifts the catabolism of catecholamines in man from oxidative to reductive pathways (Davis et al., 1967). This alteration in metabolism presumably occurs as a function of changes in NAD-NADH ratios in the liver produced by ethanol metabolism or competitive inhibition of aldehyde dehydrogenase or both (Mendelson, 1970).

An adrenal hormone of great interest in relation to alcohol consumption is cortisol. Cortisol is one of the glucocorticoids. The adrenal gland normally is stimulated to secrete cortisol by circulating ACTH from the pituitary gland. There is a pronounced diurnal variation rate of secretion, being maximal in the early morning, slowly declining during the day and minimal at night (White, 1964). Increased blood levels of cortisol occur whenever the body is subjected to marked physical or emotional stress. The biochemical and physiological actions of cortisol are numerous and quite varied.

Elevation of the blood cortisol level following the drinking of alcoholic beverages has frequently been observed. Jenkins and Connolly (1968) using normal healthy subjects, found that the cortisol level remained within normal limits until the blood alcohol level exceeded 0.10% at which time the cortisol would begin to rise. The cortisol levels then fell in association with the decline in ethanol concentration. Four other patients with known hypothalamic or pituitary lesions were tested in the same manner but showed no cortisol response to ethanol, indicating that the probable mediation of the cortisol stimulation is through the hypothalamic-pituitary pathway.

Mendelson et al. (1966) measured blood alcohol and cortisol during a four-day period of experimentally induced intoxication and a three-day post intoxication period in both alcoholic and nonalcoholic groups. His results indicated that there may be

rather basic differences in the cortisol response to ethanol in the two groups. During the four-day drinking period, alcohol was administered in the form of an 86-proof beverage mixture every four hours, day and night. The subjects would ingest up to the equivalent of 4 gm of absolute alcohol per kilogram of body weight per day. This was equivalent to 29 oz of 86-proof alcohol per day for a 70 kg man.

Mendelson found that the nonalcoholic subjects ingested less alcohol than did the alcoholic subjects. This was due to the development of gastrointestinal symptoms characterized by nausea, epigastric pain and vomiting in the nonalcoholic subjects. This illness prevented consumption of the maximum amount of alcohol that these subjects could have ingested per day during the four-day drinking period (Mendelson et al., 1966). None of the alcoholic subjects developed gastrointestinal symptoms, and consequently were able to ingest the maximum amount of alcohol provided. The mean blood alcohol level for the alcoholic group for the four-day period was 0.098% while for the nonalcoholic group it was 0.033%. It is important to note here that the differences in the blood alcohol in the two groups resulted to a large extent from the difference in total alcohol amount consumed and that total alcohol consumption was physiologically not volitionally determined. In this study the nonalcoholic subjects simply could not drink as much as the alcoholic subjects.

The serum cortisol values during the predrinking period were similar for both groups and within normal limits. As the drinking phase began, the cortisol level for both groups rose but the magnitude of rise was greatest for the alcoholic group. While drinking, the cortisol level for all subjects remained elevated. Within the nonalcoholic group, the peak cortisol levels appeared on the day or days when the subjects experienced gastrointestinal distress. In these subjects the cortisol level appeared to correlate well with the physiological stress of gastrointestinal dis-

tress. In the post-drinking phase the serum cortisol level decreased gradually toward the normal predrinking levels.

The cortisol curve for the subjects in the alcoholic group had a very different configuration. It rose as the drinking phase commenced and remained elevated during the ingestion period. However, during the post-drinking period, instead of declining, the cortisol level continued to rise. The post-drinking serum cortisol levels shown by the alcoholic subjects were highest during this phase of the experiment and associated with the appearance of withdrawal symptoms in two and prodromata of such symptoms in the other two. Their cortisol value returned to normal only after the cessation of all withdrawal symptoms. Again it would appear that the peak cortisol elevation corresponded to a period of physiological stress.

Since the alcoholics experienced no gastrointestinal symptoms during the ingestion phase, it remains to be explained why they had significant elevations in their cortisol level during this period. Mendelson feels that it is unlikely that decreased metabolism or utilization of cortisol could account for this because cortisol is degraded in the liver and the liver tests run before and after the experimental period were normal for all subjects. He postulates rather that, in alcoholics, chronic ethanol ingestion leads to an increase rather than a decrease in anxiety levels (Mendelson et al., 1964). Both experimentally induced anxiety (Persky et al., 1956) and anxiety occurring during real life (Hodges, et al., 1962) have been associated with increased levels of serum cortisol in human subjects. Therefore, Mendelson reasons that chronic ethanol ingestion by alcoholics results in a progressive dysphoric state which stimulates the hypothalmic-pituitary complex to increase ACTH secretion. This in turn stimulates the adrenal gland to increase ACTH levels during chronic alcohol ingestion. Research is in progress (Mendelson, 1970) on this topic.

Mendelson's assumption that the increased cortisol levels result from increased production of cortisol rather than decreased degradation is called into question by the findings of Margraf (1967). He measured hydrocortisone rather than cortisol, but the two glucocorticoids are very similar. He found that the alcoholics had a lower metabolic rate for exogenously administered hydrocortisone when compared with nonalcoholics, and that the proportion of the various metabolites excreted by the alcoholics varied from normal. These findings strongly indicate that alcoholics may handle the glucocorticoids in an abnormal manner. Margraf also found that the alcoholics had an elevated fasting plasma hydrocortisone level, in contrast to Mendelson's findings in which the baseline cortisol levels were similar for both groups. Margraf observed a decreased hydrocortisone response in the alcoholics to surgical stress and ACTH stimulation. This finding of an apparent decreased reserve of the gland is consistent with his earlier findings of an increased baseline level in the alcoholics.

Some of the discrepancies between the findings of Mendelson and Margraf may be explained by differences in the subjects used. Mendelson used prisoners who had been incarcerated, and therefore abstinent, for a period of at least two months, while Margraf used patients whose last drinking episodes may have been more recent. It is quite possible that recent alcohol abuse may lead to persistent changes in the adrenal gland or metabolism of the glucocorticoids which only slowly revert to normal after long periods of abstinence.

It is possible that the increased adrenocortical activity associated with chronic drinking is important in modifying the physiologic processes that determine metabolic tolerance for ethanol. High levels of cortisol may increase the metabolism of ethanol. Mendelson found that those subjects who had the highest rise in cortisol level while drinking also showed the greatest increase in ethanol metabolism following the drinking

phase (Mendelson and Stein, 1966). The glucocorticoids alter carbohydrate metabolism and this change effects the NAD-NADH ratio in the liver. If the NAD-NADH ratio is truly the rate limiting factor in ethanol metabolism as discussed before, then changes in the cortisol level could affect the metabolic rate (Mendelson, 1970). There is no direct evidence for this, but it is possible that cortisol may affect the activity of ADH or alcohol dehydrogenase.

Considerable evidence from animal experimentation is accumulating to show that the adrenocortical hormones may be of importance in the degree of adaptation or central-nervous-system tolerance for ethanol. Working with adrenalectomized rats, Rikimaru (1968) showed that these rats when compared with non-adrenalectomized animals had: (1) a statistically significant prolongation of the loss of the righting reflex and postataxic period after ethanol administration, (2) a lower rate of ethanol metabolism. Administration of cortisone to these adrenalectomized rats reversed the deficits. Kakihana et al. (1968) found a correlation between the magnitude of plasma corticosterone response after ethanol ingestion and the level of behavioral tolerance to ethanol in strains of mice that show different degrees of tolerance for ethanol as assessed by behavioral techniques. These data converge to suggest that the effects of ethanol on animal behavior may be related in large part to the responsiveness of the pituitary-adrenal axis to ethanol (Mendelson, 1970).

Certainly a great deal more experimental work is needed before definite statements can be made regarding the role of cortisol in alcoholism but some facts seem rather evident at this time. First, alcoholics, when compared with nonalcoholics, have a gastrointestinal tolerance for orally administered alcohol. This tolerance is associated with a high level of circulating cortisol. The nonalcoholic simply cannot consume and absorb as much ethanol as the alcoholic. This places diagnostic importance

on the high blood alcohol concentrations found at the time of arrest or admission to a hospital. Mendelson's data albeit based on only a few subjects, indicate that it is unlikely that high BACs will be reached by social drinkers in normal drinking situations. Secondly, the cortisol response in alcoholics appears to be heightened and prolonged when measured during an extended drinking period. If the cortisol response can be shown to be different for alcoholics and nonalcoholics after the acute administration of ethanol, then science would have a biochemical differentiation. At the present time cortisol determinations are expensive and are not routine in many laboratories. There is also the problem that cortisol secretion follows a normal diurnal variation and therefore cortisol determinations made while an individual was intoxicated would have to be compared with determinations made at the same time of day when the person was sober. These difficulties would make the assessment of cortisol levels impractical in the every day setting even if they proved to be of diagnostic value.

The clinical entity of alcohol-induced hypoglycemia has recently been described (100 cases) and is now receiving rather extensive investigation. The incidence of this syndrome is low but when it occurs the hypoglycemia is profound and often life threatening. A number of investigators have found it to occur after alcohol ingestion only in fasting subjects (Dorf et al., 1967; Dettwyler, 1967; Verdy and Saliou-Diallo, 1968; Arky et al., 1968). Ethanol interferes with gluconeogenesis (production of glucose) and induces hypoglycemia whenever gluconeogenesis is required to maintain normal glucose levels (Arky et al., 1968). In the fasting state the hepatic glycogen stores are low and gluconeogenesis is essential. Steer et al. (1969) review the literature which describes five cases in which alcoholic hypoglycemia was associated with an ACTH deficiency. In all of these

cases glucocorticoid therapy prevented or dramatically improved the hypoglycemic response to ethanol. Cortisol and the other glucocorticoids stimulate gluconeogenesis and therefore would tend to counterbalance the inhibitory effect of ethanol. If the individual were ACTH deficient he would have low cortisol, and combined with the inhibition induced by the ethanol, the two conditions would tend to aggravate one another. Steer suggests that ACTH deficiency may be common in alcoholic hypoglycemia but tests for it have rarely been made. He also suggests that the ACTH deficiency is caused by chronic alcoholism.

Alcoholic hypoglycemia has also been found to be highly associated with overt or latent diabetes mellitus (Dettwyler, 1967; Verdy and Saliou-Diallo, 1968; Arky et al., 1968; and Hed et al., 1968). The exact mechanism whereby ethanol predisposes diabetics to the development of hypoglycemia is not clear. It would appear from the literature that alcohol-induced hypoglycemia is a syndrome with probable multiple causes. The inhibition of gluconeogenesis by ethanol can exacerbate a number of distinct metabolic defects to produce profound hypoglycemia.

In summary, the tests reviewed above determined:

(1) The changes in blood chemistry associated with acute or chronic ethanol intoxication.

(2) Alcohol metabolism, the various steps in the metabolism, the rate limiting factors and the effects of previous alcohol abuse on the metabolism.

(3) The enzymatic changes induced by heavy alcohol ingestion.

(4) The hormonal changes coincident with alcohol intoxication.

In all of these, heavy ethanol ingestion is associated with distinct alterations in the normal body chemistry. However, a review of this literature does not reveal any changes which are

unique to the alcoholic as compared to the social drinker who has, on a given occasion, heavily indulged in alcohol. Further study of the cortisol response to ethanol intake may show basic differences between the alcoholic and nonalcoholic but the data are too limited at this time to draw any firm conclusions. Presently there are no biochemical diagnostic tests for alcoholism.

REFERENCES: APPENDIX A

Anderson, W. Pathology, 5th Edit. C.V. Mosby Company, St. Louis, 1966.

Anton, A.H. Ethanol and Urinary Catecholamines in Man. Clin. Pharmacol. Ther. 6:462-469, 1965.

Arky, R.A., Veverbrants, E. and Abramson, E.A. Irreversible Hypoglycemia; A Complication of Alcohol and Insulin. J.A.M.A. 206:575-578, 1968.

Bang, N.O., Iversen, K., Jagt, T., and Madsen, S. Serum Glutamic Oxaloacetic Transaminase Activity in Acute and Chronic Alcoholism. J.A.M.A. 168:156-160, 1958.

Davis, V.E., Brown, H., Hoff, J.A., et al. Ethanol-Induced Alterations of Norepinephrine Metabolism in Man. J. Lab. Clin. Med. 69:787-799, 1967.

Dettwyler, W. L'alcool ethylique: cause declenchante d'une hypoglycemie. (Ethyl Alcohol as a Precipitating Cause of Hypoglycemia). Rev. med. Suisse rom. 87:60-70, 1967.

Dorf, G., Tutin, M., Riquois, Y., and Bour, H. L'hypoglycemie post-alcoolique de l'adulte; considerations cliniques, biologiques at physiopathologiques a propos de 6 observations (Postalcoholic hypoglycemia of the Adult; Clinical, Biological and Physiopathological Observations on 6 cases). Pr. med. 75:1831-1834, 1967.

Edwards, J.A. and Prince-Evans, D.A. Ethanol Metabolism in Subjects Possessing Typical and Atypical Liver Alcohol Dehydrogenase. Clin. Pharmacol. Therap. 8:824-829, 1967.

Fabre, L.F., Jr., Farmer, R.W., and Davis, H.W. Effect of Ethanol on Adrenocortical Steroid Secretion. Presented at the Symposium on Biological Aspects of Alcoholism, Houston, Texas, Nov. 18-21, 1969.

Garlind, T., Goldberg, L., Graf, K., et al. Effect of Ethanol on Circulatory, Metabolic and Neurohumoral Functions During Muscular Work in Man. Acta Pharmacol. 17:106-114., 1960.

Gebbie, T. and Prior, I.A.M. Alcoholic Hyperlipaemia. Med. J. Aust. 2:769-772, 1967.

Goldstein, A., Aronow, L., and Kalman, S.M. Principles of Drug Action. Hoeber Medical Division, Harper & Row, New York, 1969.

Harger, R.N. and Hulpieu, H.R. The Pharmacology of Alcohol, Alcoholism. G.N. Thompson (Ed.) Charles C. Thomas, Springfield, Ill., pp. 103-232, 1956.

Hed, R.N. and Sundblad, L. Insulin Response in Chronic Alcoholism. Lancet. 1:145, 1968.

Hodges, J.R., Jones, M.T., and Stockham, M. Effect of Emotion on Blood Corticotropin and Cortsil Concentration in Man. Nature. 193:1187, 1962.

Isselbacher, K. and Greenberger, H. Metabolic Effects of Alcohol on the Liver. New Eng. J. Med. 270:351-356, 402-410, 1964.

Jacobsen, E. The Metabolism of Ethyl Alcohol. Pharmacol. Rev. 4:107-135, 1952.

Jenkins, J.S. and Connolly, J. Adrenocortical Response to Ethanol in Man. Brit. Med. J. 2:804-805, 1968.

Kakihana, R., Noble, E.P., and Butte, J.C. Corticosterone Response to Ethanol in Inbred Strains of Mice. Nature (London). 218:360-361, 1968.

Kalant, H. The Pharmacology of Alcohol Intoxication. Quart. J. Stud. Alc. Suppl. 1:1-23, 1961.

Kallio, V., Saarimaa, H., and Saarimaa, A. Serum Lipids and Postprandial Lipemia in Alcoholics After a Drinking Bout. Quart. J. Stud. Alc. 30:565-569, 1969.

Kamner, M.E. and Dupong, W.G. Alcohol Problems. New York State J. Med. 69:3105-3110, 1969.

Klingman, G.I. and Goodall, M.C. Urinary Epinephrine and Levartherenal Excretion During Acute Sublethal Alcohol Intoxication in Dogs. J. Pharmacol. Exp. Ther. 121:313-318, 1957.

Knott, D.H. and Beard, J.D. Liver Function in Apparently Healthy Chronic Alcoholic Patients. Amer. J. Med. Sci. 252:260-264, 1966.

Lieber, C.S., Jones, D.P., Losowsky, M.S., and Davidson, C.S. Interrelation of Uric Acid and Ethanol Metabolism in Man. J. Clin. Invest. 41:1863-1870, 1962.

Lieber, C.S. and DeCarli, L.M. Ethanol Oxidation by Hepatic Microsomes: Adaptive Increase After Ethanol Feeding. Science. 162:917-918, 1968.

Lieber, C.S., Robin, E., and DeCarli, L.M. Respective Role of Dietary and Metabolic Factors in the Pathogenesis of the Alcoholic Fatty Liver: The Biochemical Basis for the Ethanol-Induced Liver Injury, Biochemical and Chemical and Clinical Aspects of Alcohol Metabolism. Edited by V.M. Sardesai. Charles C. Thomas, Springfield, Ill., pp. 176-188, 1969.

Madsen, S., Bang, N., Iversen, K., and Jagt, T. The Influence of the Diet on the Serum Glutamic Oxaloacetic Transaminase in Acute Intoxication of Chronic Alcoholics. Dan. Med. Bull. 6:33-37, 1959.

Margraf, H.W., Moyer, C.A., Ashford, L.E., and Lavalle, L.W. Adrenocortical Function in Alcoholics. J. Surg. Res. 7:55-62, 1967.

Mendelson, J.H., LaDou, J., and Solomon, P. Experimentally Induced Chronic Intoxication and Withdrawal in Alcoholics. Part 3. Psychiatric Findings. Quart. J. Stud. Alc. (Supp. 2). May 1964.

Mendelson, J.H. and Stein, S. Serum Cortisal Levels in Alcoholic and Nonalcoholic Subjects During Experimentally Induced Ethanol Intoxication. Psychosom. Med. 28:616-626, 1966.

Mendelson, J.J. Ethanol-1-C^{14} Metabolism in Alcoholics and Nonalcoholics. Science. 159:319-320, 1968.

Mendelson, J.H. Biologic Concomitants of Alcoholism (Parts I and II). New Eng. J. Med. 283:24-32, 1970.

Nestch, P.J. Some Clinical and Chemical Manifestations of Alcohol-Induced Hyperlepaemia. Aust. Ann. Med. 16:139-143, 1967.

Ogata, M. Mendelson, J.H., and Mello, N.K. Electrolyte and Osmolality in Alcoholics During Experimentally Induced Intoxication. Psychosom. Med. 30:463-488, 1968.

Perman, E.S. The Effect of Ethyl Alcohol on the Secretion from the Adrenal Medulla in Man. Acta Physiol. Scan. 44:241-247, 1958.

Perman, E.S. The Effect of Ethyl Alcohol on the Secretion from the Adrenal Medulla of the Cat. Acta Physiol. Scan. 48:323-328, 1960.

Persky, H., Grinker, R.R., et al. Adrenal Cortical Function in Anxious Human Subjects. Plasma Level and Urinary Excretion of Hydrocortisone. Arch. Neurol. Psychiat. 76:549, 1956.

Raiha, N.C.R. and Oura, E. Effect of Ethanol Oxidation on Levels of Pyridine Nucleotides in Liver and Yeast. Proc. Soc. Exp. Biol. Med. 109:908-910, 1962.

Rappaport, M. NAD Effects on the Biochemistry and Psychological Performance of Alcoholics Under Ethanol Stress. Quart. J. Stud. Alc. 30:570-584, 1969.

Rikimaru, M.T. The Role of the Adrenal in the Pharmacological Effects of Ethanol. Diss. Abstr. 28(12):5141-B, 1968.

Saker, B.M., Tofler, O.B., Burvill, M.J., and Reilly, K.A. Alcohol Consumption and Gout. Med. J. Aust. 1:1213-1216, 1967.

Scheig, R. and Isselbacher, K.J. Pathogenesis of Ethanol-Induced Fatty Liver. III. In Vivo and In Vitro Effects of Ethanol on Hepatic Fatty Metabolism in Rats. J. Lipid Res. 6:269-277, 1965.

Steer, P. Clinical Alcohol Hypoglycemia and Isolated Adrenocorticotrophic Hormone Deficiency. Ann. of Intern. Med. 71:343-348, 1969.

Ugarte, G., Pino, M.E., and Insunza, I. Metabolismo del etanol en pacientes alcoholicos con y sin dano hepatico. I. Alcohol deshidrogenasa hepatica. (Metabolism of Ethanol in Alcoholic Patients With or Without Hepatic Damage. I. Hepatic Alcohol Dehydrogenase.) Rev. Med. Chile. 95:63-66, 1967.

Verdy, M. and Saliou-Diallo, G. Hypoglycemie et alcool. (Hypoglycemia and Alcohol). Canad. Med. Ass. J. 98:827-830, 1968.

Westerfeld, W.W. The Intermediary Metabolism of Alcohol. Amer. J. Clin. Nutr. 9:426-431, 1961.

White, A. (ed.) Principles of Biochemistry, 3rd Ed. McGraw-Hill Book Co., New York. 1964.

Wilson, D.E. and Arky, R.A. Changes in the Disposition of Alimentary Fat Induced by Ethanol. Diabetes. 17:306, 1968.

Yephly, T.R., Tinelli, F., and Watkins, W.D. Alcohol Metabolism: Role of Microsomal Oxidation in Vivo. Science. 166:627-628, 1969.

Appendix B

REFERENCE SOURCES FOR QUESTIONNAIRE ITEMS

Alcoholics Anonymous. Alcoholics Anonymous World Services, Inc., 1955.

Barmack, J.E. and Payne, D.E. Injury Producing Private Motor Vehicle Accidents Among Airmen. Bulletin 285, Highway Research Board, 1961.

Brown, S.L., Bohnert, P.J., Finch, J.R., Pokorny, A.D. and Smith, J.O. Alcohol Safety Study: Drivers Who Die. Houston, Baylor University College of Medicine, 1968.

Cisin, I.H. and Cahalan, D. A Comparison of Abstainers and Heavy Drinkers in a National Survey. Paper delivered at the Annual Meeting of the American Psychiatric Association, Washington, D.C. 1966.

Curlee, J. Alcoholism and the 'Empty Nest'. Bull. Menn. Clin. 33:165-171, 1969.

Guze, S.B., Tuason, V.B., Gatfield, P., Stewart, M.A. and Picken, B. Psychiatric Illness and Crime with Particular Reference to Alcoholism: A Study of 223 Criminals. J. Nerv. Ment. Dis. 134:512-521, 1962.

Horn, J.L. and Wanberg, K.W. Symptom Patterns of Alcoholics. Quart. J. Stud. Alc. 30:35-58, 1969.

Johnson, L.C., Burdick, J.A. and Smith, J. Sleep During Alcohol Intake and Withdrawal in the Chronic Alcoholic. Arch. Gen. Psychiat. 22:406-418, 1970.

Jones, M.C. Personality Correlates and Antecedents of Drinking Patterns in Adult Males. J. Consult. Clin. Psychol. 32: 2-12, 1968.

MacAndrew, C. Self-Reports of Male Alcoholics: A Dimensional Analysis of Certain Differences from Nonalcoholic Male Psychiatric Outpatients. Quart. J. Stud. Alc. 28:43-51, 1967.

Mortimer, R.G. and Lower, J.S. Development of a Driver Alcoholism Test. Highway Safety Research Institute, University of Michigan, Ann Arbor, 1970 (unpublished document).

Pollack, S. Drinking Driver and Traffic Safety Project. Vol. I. Public Systems Research Institute, University of Southern California, Los Angeles, 1969.

Selzer, M.S., Payne, C.E., Westervelt, F.H. and Quinn, J. Automobile Accidents as an Expression of Psychopathology in an Alcoholic Population. Quart. J. Stud. Alc. 28: 505-516, 1967.

REFERENCES SOURCES FOR ITEM POOL USED BY MORTIMER AND LOWER (1970)

Bailey, M.B., Haverman, P.W. and Sheinberg, J. Identifying Alcoholics in Population Surveys: A Report on Reliability. (Prepublication abstract).
This reference discusses: The Washington Heights Health Survey Questionnaire.

Hampton, P.J. A Psychometric Study of Drinkers. J. Consult. Psychol., 15:501-504, 1951.
This reference discusses: Hampton's 125 Items from the MMPI.

Hampton, P.J. Representative Studies of Alcoholism and Personality. J. Soc. Psychol. 34:203-233, 1951; 35:23-35, 1952.
This reference discusses: The Lentz Expressionnaire.

Holt, N.F. A 16 P-F Profile for Prisoners Convicted of 'Drunk and Disorderly' Behavior. Brit. J. Criminol. 5:196-197, 1965.
This reference discusses: The Holt and Sedlacek Items from the MMPI.

MacAndrew, C. and Geertsma, R.H. A Critique of Alcoholism Scales Derived from the MMPI. Quart. J. Stud. Alc. 25:68-76, 1964.
This reference discusses: The MacAndrew Scale from the MMPI.

Manson, M.P. A Psychometric Differentiation of Alcoholics from Nonalcoholics. Quart. J. Stud. Alc. 9:175-206, 1948.
This reference discusses: ALCADD Test.

Manson, M.P. A Psychometric Analysis of Psychoneurotic and Psychosomatic Characteristics of Alcoholics. J. Clin. Psychol. 5:77-83, 1949.
This reference discusses: The Manson Evaluative Test.

Manson, M.P. A Psychometric Analysis of Psychopathic Characteristics of Alcoholics. J. Consult. Psychol. 13:111-118, 1949.
This reference discusses: Manson's 28 Items from the MMPI Pd Scale.

Appendix C

RATIONALE FOR THE SELECTION OF QUESTIONNAIRE ITEMS

Empirical and eclectic methods were used in choosing the appropriate items to include in the Questionnaire-Form A. The empirical method selects appropriate questions on a topic (e.g. problem drinking) by means of statistics rather than logic. A large number of questions are presented to criterion groups, such as problem drinkers and social drinkers, and the answers are analyzed. The questions that the groups answer differently to a significant degree can then be used as predictors of group membership; at this point such a procedure is termed "initially validated" as it has been tested once for its ability to differentiate groups. If these initially validated questions are then given to new populations of problem drinkers and social drinkers, their ability to significantly differentiate the criterion groups can be reassessed. The questions which the groups answer differently to a significant degree on the second administration, as well as on the first administration, are then said to have been "cross-validated." These questions will then have demonstrated their ability to discriminate on two different samples, whereas initially validated items have only proven their discriminability on one sample. Therefore, more confidence can be placed on cross-validated predictor items than on initially validated predictor items even though they both have shown an ability to differentiate members of one criterion group, from those of another criterion group.

The questions validated by Mortimer and Lower[1] were derived from various psychological studies (see Appendix B for references). Some questions were then cross-validated and included in the questionnaire on that empirical basis. They will not be discussed here but can be found by referring to the following numbers

which correspond to the items in the Questionnaire Form A: 25, 26, 38, 43, 45, 46, 47, 48, 50, 52, 54, 55, 57, 58, 59, 60, 61, 63, 64, 65, 67, 75, 77, 78, 79, 81, 83, 85, 86, 87, 89, 91, 93, 98, 99, 100, 101, 102, 103, 107, 108, 109, 110, 111, 115, 116, 117, 118, 119, 120, 124, 125, and 126.

The associations between the other items and problem drinking were developed through an eclectic method. Items which were found in the literature to correlate with problem drinking were incorporated into the questionnaire. These items are discussed below for those who would like to know the relationships between problem drinking and the items used.

Q.1. What is your present marital status?

Marital status was found to differentiate a random sample group taken from the California Department of Motor Vehicles from a group with three or more drunk driving offenses.[2] Those indicating that they were separated or divorced comprised 5.5% of the random sample compared to 34.4% of the sample with three or more drunk driving convictions.

Q.2. With whom do you live?

Living arrangement was also found to differentiate a random sample from those with three or more drunk driving convictions. Pollack[2] reports persons living with their spouses to comprise 70.3% of the random sample as compared to 41.1% of the sample having three or more drunk driving convictions. Persons living alone comprised 8.7% of the random sample. Of those having three or more drunk driving convictions, 27.9% lived alone.

Q.3. Have you been widowed within the past two years?

In a discussion on stress Pollack[2] states that loss of a loved one through death may be an extremely stressful event.

Such an event could precipitate an excessive drinking pattern. In a study of female alcoholics,[3] 30 women reported "precipitating stress." Twenty-one were found to be facing an identity crisis; five cases of which were brought on by the husband's death.

Q.4. Have you been separated or divorced within the past two years?

Change in marital status in the last two years was included to determine if the relationship found by Pollack[2] between marital status and number of drunk driving convictions holds up upon inspection of recent marital status. Also, stress which may accompany separation or divorce was found to occur with a high degree of frequency in fatalities; most of whom were alcoholics.[4]

Q.5. How many times have you been married?

Pollack[2] found that 18.2% of the random sample reported being married 2 or 3 times compared to 29.6% of the persons with three or more drunk driving offenses.

Q.6. How many times have you and your wife (husband) seriously considered divorce in the last two years?

"That the drinking accidents may be selective of individuals with current marital adjustment problem(s)" is a statement supported by Barmack and Payne (1961).[5] Pollack's results[2] would tend to confirm that there is at least a strong association between marital adjustment problems and drunk driving convictions.

Q.7. Does (did) your wife (husband) cause problems in your marriage?

The marital maladjustment just mentioned is here combined with the paranoia (fear of others), and thus projection (blaming others) that is sometimes associated with alcohol-related driving fatalities.[4]

Q.8. Does (did) your wife (husband) often threaten you with divorce?

Threat of divorce will indicate marital maladjustment which is not necessarily reflected in marital status, living arrangement, or number of marriages.

Q.9. Does (did) your wife (husband) work?

Financial difficulties may be encountered by persons who have lost a working spouse through death (item 3). Financial difficulties are implicated by Pollack's results[2] showing that only 14.8% of the random sample earned $6,000 or under, while 54.4% of those with three or more drunk driving offenses were in this category. Similarly, the percentages were 15.7% and 33.1%, respectively, for those reporting that their income was not sufficient for their basic needs.

Q.10. Do (did) you know her (his) salary?

Spouses' yearly salary was found by Pollack[2] to be unknown by 2.5% of the random sample and 11.1% of those with three or more drunk driving convictions.

Q.11. Is (was) your wife (husband) disabled?
(See item 9)[2]

Q.13. As a driver <u>how many</u> traffic accidents have you been involved in during the last two years?

Number of accidents was taken from the information sheet used by Mortimer and Lower[1] and was updated to include only the last two years to measure current behavior and avoid prejudicial implications from past behavior.

Q.14. About <u>how many</u> moving traffic violations (other than parking tickets) have you had in the last two years?

See item 13.

Q.15. About how many points have you accumulated against your driving license in the last two years?

The item on moving traffic violations was restated to assess the same type of information from persons who are aware of their standing within a point system, but do not recall the number of violations.

Q.16. How many states have you lived in since you were 18 years old?

This restatement of an information item used by Mortimer and Lower[1] divides the number of moves from state to state into pre-adult (i.e., non-voluntary) moves and voluntary moves by using age 18 as a splitting point. Also Guze, et al.,[6] found that there was significantly more wanderlust in alcoholic criminals than non-alcoholic criminals, with differences being 33% of the alcoholic group compared to 18% of the non-alcoholic group, respectively.

Q.17. About how many states did you live in before you were 18?

See item 16.

Q. 18. Did you lose a parent by death, divorce or separation before the age of fifteen?

Loss of parent was included because of its previous use by Mortimer and Lower.[1]

Q.19. Are you employed now?

Present employment was included because of its previous use by Mortimer and Lower.[1]

Q.20. Are you laid off temporarily?

Pollack[2] found differences of 2.9% versus 13.3% among those unemployed when comparing the random sample with the three or more drunk driving offense group.

Q.21. Are you looking for work?

Pollack[2] found those who are looking for work to comprise 18.4% of the random sample compared to 33.3% of those with three or more drunk driving convictions.

Q.22. Are you retired?

Pollack[2] suggests that retirement may be a stressful event. He cites Selzer's work[7] which showed that having one or more stresses was highly over-represented in the alcoholic accident population. These stresses could be of vocational, financial, or other origin. Curlee[3] also associates change in husband's vocational status with a "precipitating stress" leading to alcoholism in women. Brown,[4] reporting on fatalities, 60% of whom were alcoholic, found that 80% of the victims were faced with major stressful events involving personal functions, financial problems, or vocational difficulties.

Q.23. Are you living on a pension?

Whether or not a person is living on a pension may provide a gross estimate of financial problems among retired persons (also see items 9 and 22).

Q.24. Do you smoke?

Non-smokers were found by Pollack[2] to comprise 54.9% of the random sample versus 11.4% of those having three or more drunk driving convictions.

Q.27. About <u>how many</u> packs of cigarettes do you smoke per week?

Pollack[2] has demonstrated the strong relationship between amount of smoking and number of drunk driving convictions.

Q.28. About <u>how many</u> cigars or pipes do you smoke per week?

See item 27.

Q.29. Do you ever go by another name (an alias)?

Use of an alias was found by Pollack[2] among 44% of the drunk drivers as opposed to less than 4% of the driver's license renewal applicants.

Q.30. Were you ever arrested?

The relationship between having been arrested and drunk driving is shown to be substantial.[2] Guze, et al.,[6] also noted the significance of the number of arrests in discriminating alcoholics and reported that criminals arrested only once were significantly more likely to be non-alcoholics.

Q.31. Have you ever been in the service?

This question is a lead in for questions 32 and 33 to reduce the analysis of those items to include only persons who were in the service.

Q.32. Did you ever re-enlist?

Re-enlistment was added, to grossly estimate the amount of time served, so that a time span could then be related to item #33.

Q.33. Were you ever AWOL (Absent Without Leave)?

Guze, et al.,[6] reported that frequency of demotions, AWOL, fines, and court-martials are all significant (.05, .05, .01 and .01 levels, respectively) in differentiating alcoholic criminals from non-alcoholic criminals.

Q.34. Are your relatives upset with the way you live?

"Relative upset" stems from similar ideas in initially validated questions 35, 80, 230, 235 and 240 by Mortimer and Lower.[1] Question 3 on the MAST[8] is also similar.

Q.35. Is your income sufficient for your basic needs?

Insufficient income for basic needs was found by Pollack[2] among 33.1% of those with three or more drunk driving convictions versus 15.7% of the random sample.

Q.36. Are you disabled?

Pollack[2] found that 30% of those having three or more drunk driving convictions were disabled compared to only 1.9% of the random sample.

Q.37. Would you say that your general health is very good?

Lack of very good general health was found among 74.2% of those with three or more drunk driving convictions versus 33.3% of the random sample.[2]

Q.39. Have you recently undergone a great stress (such as something concerning your job, your health, your finances, your family, or a loved one)?

The concept of stress (job, health, finances, family, or death) leading to excessive drinking and driving is supported by Pollack[2]. Also see items 3, 4, and 22.

Q.40. Do you continually fear something tragic will happen to you?

Continual fear of a tragic event is a combination of two items used by Mortimer and Lower.[1]

Q.41. Would you say that you have more problems to worry about than most people?

Having more than one's share of problems may be indicative of paranoia. Brown et al.,[4] reported finding a high percentage of paranoid features, usually secondary characteristics, in his fatality group, 60% of whom were diagnosed as alcoholic. These features included suspicion, hypersensitivity, and feelings of inadequacy, mistreatment, underpayment, and resentment.

Q.42. Is your daily life full of fear or anxiety?

Fear and anxiety are components of paranoia which is related to alcoholism as mentioned in item 41.

Q.44. Do you resent your position in society?

Resentment of one's position in society was found among the paranoid features in the fatalities studied by Brown et al.[4]

Q.49. Within the last year have you gotten into a fist fight or hit anybody?

"Physical fighting" was implicated as a predictor by an initial validation of a similar item by Mortimer and Lower.[1] Also, Guze et al.[6] reported significant differences between alcoholic and non-alcoholic criminals. The significance level for this discrimination was at the .01 level for reported fighting before age 18 and at the .001 level for reported fighting after age 18.

Q.51. Are others overly critical of you?

"Others being overly critical" was implicated as a predictor by an initial validation of a similar item found significant by Mortimer and Lower.[1] This implication is supported by findings connecting alcoholism and paranoid features reported by Brown et al.[4] Also see item 41.

Q.53. Do you feel inferior to others?

"Inferiority feelings" were implicated as a predictor by an initial validation of a similar item found significant by Mortimer and Lower.[1] Also see item 41.

Q.62. Do you feel that you have abnormal problems?

Brown et al.[4] reported on the relationship between fatal accidents, alcohol, and paranoid features. Persons having paranoid features feel that they have abnormal problems because of their persecution by others.

Q.66. Do you have guilt feelings about money?

Horn and Wanberg[9] found that most of their alcoholic subjects felt remorseful about wasting time and money because of drinking. Also see item 9.

Q.68. Do you have guilt feelings about sex?

"Guilt feelings about sex" is a paraphrase of MMPI item 179 used on MacAndrew's 49 item scale.[10] This cross-validated scale correctly classified 81.5% of a combined sample of alcoholics and non-alcoholics.

Q.70. Do social gatherings where you must "watch yourself" bother you?

See item 41.

Q.71. Are you shy with the opposite sex?

"Shy with the opposite sex" is a permutation of an initially validated item regarding shyness with individuals of the same sex found significant by Mortimer and Lower.[1]

Q.72. Do you drink any alcoholic beverages, such as beer, wine, champagne, liquor, spirits, or alcohol?

"Do you drink any alcoholic beverages" is asked as a control question for other questions involving drinking and its affects.

Q.73. Does drinking help you make friends?

This item about using drinking to help make friends is a paraphrase of item 21 of the Drinking History Questionnaire reported by Horn and Wanberg.[9]

Q.74. Are you afraid of any of your acquaintances?

See item 41.

Q.76. Do you think that creditors are much too quick to bother you for payments?

See items 9 and 22.

Q.80. Do you usually perspire at night?

"Usually perspiring at night" was found to be the case for 15.9% of those having three or more drunk driving convictions, but for only 1.7% of a random sample.[2]

Q.82. About how many years has it been since your last out-of-town vacation?

"Time elapsed since last out-of-town vacation" was included as an assessment of financial affairs and long-term stress; both of which are related to alcohol abuse - see items 9 and 22.

Q.84. Would you say that your sexual capacity or power has declined?

This question regarding sexual capacity is used because it paraphrases an initially validated item by Mortimer and Lower.[1]

Q.88. Do you talk in your sleep?

"Talking in one's sleep" may indicate a sleep disturbance. Sleep disturbances were found among chronic alcoholics by Johnson.[11]

Q.90. Have you ever had your driver's license suspended or revoked?

Pollack[2] reported that the difference between those in the three or more drunk driving convictions sample and the random sample for minor traffic violations was 59.0% versus 16.9%, respectively; for major traffic violations this difference was 66.8% versus 0.8%. He also reported that approximately 55% of the drunk driver group had one or more alcohol-related vehicle code convictions, whereas, only approximately 0.5% of the driver's license groups met this conviction criteria. This high incidence of minor and major traffic violations and alcohol-related convictions should be associated with license suspension and revocations.

Q.92. About how many times have you asked for help for your problems (personal, family, marriage, money, or emotional)?

This was asked because the amount of help sought should be indicative of the amount of stress one has undergone. Also, see item 22.

Q.94. Do you know anyone who is an excessive drinker?

This question is used to determine the gross level of social contact with alcoholics. Cisin and Cahalan[12] found that more abstainers and heavy drinkers than average drinkers reported having a close friend with a fairly serious drinking problem.

Q.95. Do you have a relative who is an excessive drinker?

This item is used because Cisin and Cahalan[12] showed that more abstainers and heavy drinkers than average drinkers reported having a close relative with a drinking problem.

Q.96. Is there a history of alcoholism in your family?

Guze et al.[6] reported that 50% of the alcoholic criminals he studied had a "family history" of alcoholism and that this incidence is significantly greater than that of the non-alcoholic criminal population.

Q.97. A heavy drinker or alcoholic is just a regular guy like anybody else and shouldn't be prevented from driving.

This statement is used to measure identification and empathy with the problem drinker.

Q.104. Drinking seems to ease personal problems.

Pollack[2] reported that 29.2% of those with three or more drunk driving convictions admitted drinking to cope with personal problems while only 4.7% of the random sample did so. Of those with three or more drunk driving convictions 48.8% reported drinking to ease tension when worried or upset while only 11.0% of the random sample did likewise.

Q.105. How many drinks can you handle and still drive well?

The number of drinks that one can have and still drive well was found to be a significant discriminator by Pollack.[2] He reported the following differences for those with three or more

drunk driving convictions versus the random sample.

Over 4: 63.9% (3 + DD) versus 36.2% (DMV)
Over 5: 53.2% (3 + DD) versus 25.5% (DMV)
Over 6: 32.7% (3 + DD) versus 8.0% (DMV)
8 or over: 31.1% (3 + DD) versus 7.2% (DMV)

Q.106. In the last year, how many times have you drunk more than you could handle, but still been a good driver when you got behind the wheel?

Drinking more than one can handle, but still being a good driver was found to be a significant discriminator.[2] Those persons answering six or more times a year comprised 52.5% of the three or more drunk driving convictions sample compared to only 11.4% of the random sample. Similarly, those answering "never" comprised only 20.5% of the three or more drunk driving convictions sample compared to 63.5% of the random sample.

Q.112. Do you feel sinful or immoral?

"Feeling sinful or immoral" was implicated as a predictor by an initially validated item found significant by Mortimer and Lower.[1]

Q.113. A drink or two gives me energy to get started.

"Drinking gives me energy" was implicated as a predictor by an initially validated item found significant by Mortimer and Lower.[1]

Q.114. Does drinking help you work better?

"Drinking helps me work better" is a paraphrase of the significantly discriminating item 24 from the Drinking History Questionnaire used by Horn and Wanberg.[9]

Q.122. Would you say that 4 or 5 drinks affect your driving?

See item 105.

Q.123. Even when you're bombed, can you still drive home safely?

See item 106.

Q.127. About how many dreams have you had in the last three months?

Amount of dreaming is questioned in reference to the large number of initially validated questions regarding sleep reported by Mortimer and Lower.[1] The effect of alcohol in inhibiting dreams was also mentioned in the literature.[11]

Q.128. How many times have you been admitted to a hospital?

"Number of hospital admissions" relates to MAST[8] item 21 which found a difference of 44% and 1% between alcoholics and controls, respectively, for having been admitted to a hospital because of drinking.

Q.129. There is very little a person like myself can do to reduce his chances of being in an automobile crash.

A positive response to this statement may reflect a feeling of powerlessness over one's life situations which could either be caused by, or cause problem drinking.[13]

Q.130. More and more I feel helpless in the face of what's happening in the world today.

See item 129.

Q.131. Sometimes I feel all alone in the world.

See items 41 and 62.

Q.132. Many times I feel that I have little influence over the things that may happen to me while driving.

See item 129.

Q.133. Most people live lives of quiet desperation.

See item 129.

Q.134. Do you have any relatives who are severely emotionally disturbed?

Guze et al.[6] reported a family history of suicide in 14% of alcoholic criminals compared to 2% of the non-alcoholic criminals.

Q.135. A man who can't hold his liquor is not a man at all.

This phrase ascertains the gross masculinity implicated to be associated with excessive alcohol intake, especially among younger drinkers.[14]

REFERENCES: APPENDIX C

1. Mortimer, R.G. and Lower, J.S. Development of a Driver Alcoholism Test. Ann Arbor, The University of Michigan, Highway Safety Research Institute, 1970 (unpublished document).

2. Pollack, S. Drinking Driver and Traffic Safety Project. Vol. I, Public Systems Research Institute, Univ. of S. Calif., Los. Angeles, 1969.

3. Curlee, J. Alcoholism and the 'Empty Nest'. Bull. Menninger Clin. 33:165-171, 1969.

4. Brown, S.L., Bohnert, P.J., Finch, J.R., Pokorny, A.D., and Smith, J.P. Alcohol Safety Study: Drivers Who Die. Baylor University College of Medicine, Houston, 1968.

5. Barmack, J.E. and Payne, E.D. "Injury Producing Private Motor Vehicle Accidents Among Airmen." Bulletin 285, Highway Research Board, 1961.

6. Guze, S.B., Tuason, V.B., Gatfield, P., Steward, M.A., and Picken, B. Psychiatric Illness and Crime with Particular Reference to Alcoholism: A Study of 223 Criminals. J. Nerv. and Ment. Dis. 134:512-521, 1962.

7. Selzer, M.S., Payne, C.E., Westervelt, F.H., and Quinn, J. Automobile Accidents as an Expression of Psychopathology in an Alcoholic Population. Quart. J. Stud. Alc. 28:505-516, 1967.

8. Selzer, M.L. The Quest for a New Diagnostic Instrument. Amer. Psychiat. Assoc., Annual Meeting, San Francisco, Calif., May 11-15, 1970.

9. Horn, J.L. and Wanberg, K.W. Symptom Patterns Related to Excessive Use of Alcohol. Quart. J. Stud. Alc. 30:35-58, 1969.

10. MacAndrew, G. Self Reports of Male Alcoholics: A Dimensional Analysis of Certain Differences from Nonalcoholic Male Psychiatric Outpatients. Quart. J. Stud. Alc. 21:43-51, 1967.

11. Johnson, L.C., Burdick, J.A., and Smith, J. Sleep During Alcohol Intake and Withdrawal in the Chronic Alcoholic. Arch. Gen. Psychiat. 22:406-18, May 1970.

12. Cisin, I.H. and Cahalan, D. A Comparison of Abstainers and Heavy Drinkers in a National Survey. Amer. Psychiat. Assoc. Annual Meeting, Washington, D.C. 1966.

13. Alcoholics Anonymous, Alcoholics Anonymous World Services, Inc., 1955.

14. Jones, M.C. Personality Correlates and Antecedents of Drinking Patterns in Adult Males. J. of Consult. Clin. Psychol. 32:2-12, 1968.

Appendix D

HIGHWAY SAFETY RESEARCH INSTITUTE

UNIVERSITY OF MICHIGAN

FORM A
BACKGROUND AND BEHAVIOR QUESTIONNAIRE

We would like to have you complete the following questionnaire as honestly and complete as possible. Due to the personal nature of the information required, your answers will be held in strict confidence. Please *do not* put your name on the questionnaire.

IMPORTANT

Please answer *every* question on the questionnaire. If you feel that any question is very objectionable to you or invades your privacy, please *circle the number* beside the answer spaces. Work as rapidly as possible. Do not spend too much time on individual questions. We would like your first impressions, so try to answer with the first thing that comes to mind. Answer each question in the order in which it appears. An "X" or a check is all that is necessary for the "YES (TRUE)" or "NO (FALSE)" questions. Where a number is called for by a question which asks *how many*, please answer with a number – use a zero (0) if necessary. If a question truly does not apply to you please *draw a line* through the answer spaces.

Go to the next page and begin

Thank you very much for your cooperation.

Appendix D

FOR OFFICE USE ONLY

Form A 1

Serial No. _____ 2

Date _____

1. What is your present marital status?
   1. single
   2. separated
   3. divorced
   4. widowed
   5. married

   Enter number here .....(#) 3

2. With whom do you live?
   1. alone
   2. with friend(s)
   3. with relative(s)
   4. with wife (husband)
   5. with ex-wife (ex-husband)

   Enter number here .....(#) 4

IF YOU HAVE NEVER BEEN MARRIED GO TO THE NEXT PAGE; OTHERWISE GO TO THE NEXT QUESTION BELOW

		TRUE (yes)	FALSE (no)	
3.	Have you been widowed within the past two years?	( )	( )	5
4.	Have you been separated or divorced within the past two years?	( )	( )	6
5.	*How many* times have you been married? .....(#			) 7
6.	*How many* times have you and your wife wife (husband) seriously considered divorce in the last two years? .....(#			) 8
7.	Does (did) your wife (husband) cause problems in your marriage?	( )	( )	9
8.	Does (did) your wife (husband) often threaten you with divorce?	( )	( )	10
9.	Does (did) your wife (husband) work?	( )	( )	11
10.	Do (did) you know her (his) salary?	( )	( )	12
11.	Is (was) your wife (husband) disabled?	( )	( )	13
12.	Would you say (have said) that your wife's (husband's) general health is (was) very good?	( )	( )	14

		TRUE (yes)	FALSE (no)	
13.	As a driver *how many* traffic accidents have you been involved in during the last two years?	(#		) 15
14.	About *how many* moving traffic violations (other than parking tickets) have you had in the last two years?	(#		) 16
15.	About *how many* points have you accumulated against your driving license in the last two years?	(#		) 17
16.	*How many* states have you lived in since you were 18 years old?	(#		) 18
17.	About *how many* states did you live in before you were 18?	(#		) 19
18.	Did you lose a parent by death, divorce or separation before the age of fifteen?	( )	(	) 20
19.	Are you employed now?	( )	(	) 21
20.	Are you laid off temporarily?	( )	(	) 22
21.	Are you looking for work?	( )	(	) 23
22.	Are you retired?	( )	(	) 24
23.	Are you living on a pension?	( )	(	) 25
24.	Do you smoke?	( )	(	) 26
25.	Do you smoke more than the average individual of your sex?	( )	(	) 27
26.	Is smoking important to your happiness?	( )	(	) 28
27.	About *how many* packs of cigarettes do you smoke per week?	(##		) 29
28.	About *how many* cigars or pipes do you smoke per week?	(#		) 30
29.	Do you ever go by another name (an alias)?	( )	(	) 31
30.	Were you ever arrested?	( )	(	) 32
31.	Have you ever been in the service?	( )	(	) 33
32.	Did you ever re-enlist?	( )	(	) 34
33.	Were you ever AWOL (Absent Without Leave)?	( )	(	) 35
34.	Are your relatives upset with the way you live?	( )	(	) 36
35.	Is your income sufficient for your basic needs?	( )	(	) 37
36.	Are you disabled?	( )	(	) 38
37.	Would you say that your general health is very good?	( )	(	) 39
38.	Are you bothered by nervousness (irritable, fidgety, or tense)?	( )	(	) 40
39.	Have you recently undergone a great stress (such as something concerning your job, your health, your finances, your family, or a loved one)?	( )	(	) 41
40.	Do you continually fear something tragic will happen to you?	( )	(	) 42
41.	Would you say that you have more problems to worry about than most people?	( )	(	) 43
42.	Is your daily life full of fear or anxiety?	( )	(	) 44
43.	I am apt to take disappointments so badly that I can't put them out of my mind.	( )	(	) 45
44.	Do you resent your position in society?	( )	(	) 46

		TRUE (yes)	FALSE (no)	
45.	I have long periods of such great restlessness that I cannot sit long in a chair.	( )	( )	47
46.	I must admit that I have been at times worried beyond reason over something that really did not matter.	( )	( )	48
47.	Is your daily life full of interesting things?	( )	( )	49
48.	I eat at regular hours.	( )	( )	50
49.	Within the last year have you gotten into a fist fight or hit anybody?	( )	( )	51
50.	I have had periods of days, weeks or months when I could't take care of things because I couldn't get going.	( )	( )	52
51.	Are others overly critical of you?	( )	( )	53
52.	I believe that my home life is as pleasant as that of most people I know.	( )	( )	54
53.	Do you feel inferior to others?	( )	( )	55
54.	I shrink from facing a crisis or difficulty.	( )	( )	56
55.	I am happy most of the time.	( )	( )	57
56.	Are you often sad or down in the dumps?	( )	( )	58
57.	I often feel wound up.	( )	( )	59
58.	I have had periods in which I carried on activities without knowing later what I had been doing.	( )	( )	60
59.	Do you have a lot of worries?	( )	( )	61
60.	I have trouble sleeping.	( )	( )	62
61.	I am moderate in all my habits.	( )	( )	63
62.	Do you feel that you have abnormal problems?	( )	( )	64
63.	I have lived the right kind of life.	( )	( )	65
64.	My home life is as happy as it should be.	( )	( )	66
65.	I often feel bored and uneasy.	( )	( )	67
66.	Do you have guilt feelings about money?	( )	( )	68
67.	I am looking for something but don't know what it is.	( )	( )	69
68.	Do you have guilt feelings about sex?	( )	( )	70
69.	I was often unhappy because of sadness.	( )	( )	71
70.	Do social gatherings where you must "watch yourself" bother you?	( )	( )	72
71.	Are you shy with the opposite sex?	( )	( )	73
72.	Do you drink any alcoholic beverages, such as beer, wine, champagne, liquor, spirits, or alcohol?	( )	( )	74
73.	Does drinking help you make friends?	( )	( )	75
74.	Are you afraid of any of your acquaintances?	( )	( )	76
75.	Much of the time I feel as if I have done something wrong or evil.	( )	( )	77

		TRUE (yes)	FALSE (no)	
76.	Do you think that creditors are much too quick to bother you for payments?	( )	( )	78
77.	I wish I could be as happy as others seem to be.	( )	( )	79
78.	I know how to relax and take things easy.	( )	( )	80
79.	I sometimes feel that I am about to go to pieces.	( )	( )	81
80.	Do you usually perspire at night?	( )	( )	82
81.	I often feel uncomfortable and down in the dumps.	( )	( )	83
82.	About *how many* years has it been since your last out-of-town vacation?	(#		84
83.	I become sad quickly.	( )	( )	85
84.	Would you say that your sexual capacity or power has declined?	( )	( )	86
85.	I am a high-strung person.	( )	( )	87
86.	Are you the worrying type (a worrier)?	( )	( )	88
87.	I frequently find myself worrying about something.	( )	( )	89
88.	Do you talk in your sleep?	( )	( )	90
89.	I am satisfied with the way I live.	( )	( )	91
90.	Have you ever had your drivers license suspended or revoked?	( )	( )	92
91.	I quickly lose my interest or enthusiams.	( )	( )	93
92.	About *how many* times have you asked for help for your problems (personal, family, marriage, money, or emotional)?	(#		94
93.	I worry quite a bit over possible misfortune.	( )	( )	95
94.	Do you know anyone who is an excessive drinker?	( )	( )	96
95.	Do you have a relative who is an excessive drinker?	( )	( )	97
96.	Is there a history of alcoholism in your family?	( )	( )	98
97.	A heavy drinker or alcoholic is just a regular guy like anybody else and shouldn't be prevented from driving.	( )	( )	99
98.	My hardest battles are with myself.	( )	( )	100
99.	Are you often depressed and moody?	( )	( )	101
100.	I often feel as if I were not myself.	( )	( )	102
101.	I am often afraid I will not be able to sleep.	( )	( )	103
102.	I sometimes become sad or depressed for no good reason.	( )	( )	104
103.	Do you often feel afraid to face the future?	( )	( )	105
104.	Drinking seems to ease personal problems.	( )	( )	106
105.	*How many* drinks can you handle and still drive well?	(#		107
106.	In the last year, *how many* times have you drunk more than you could handle, but still been a good driver when you got behind the wheel?	(#		108
107.	I wish people would stop telling me how to live my life.	( )	( )	109
108.	I often am afraid without knowing why I am afraid.	( )	( )	110

Appendix D

	TRUE (yes)	FALSE (no)	
109. I often worry about things I fear.	( )	( )	111
110. At times I think I am no good at all.	( )	( )	112
111. I often fool myself.	( )	( )	113
112. Do you feel sinful or immoral?	( )	( )	114
113. A drink or two gives me energy to get started.	( )	( )	115
114. Does drinking help you work better?	( )	( )	116
115. My mother worried a great deal over me.	( )	( )	117
116. My daily life is full of things that keep me interested.	( )	( )	118
117. My judgment is better than it ever was.	( )	( )	119
118. I often have feelings of vague restlessness.	( )	( )	120
119. My friends are much happier than I am.	( )	( )	121
120. I often pity myself.	( )	( )	122
121. I often feel tired, have trouble sleeping,and have a poor appetite.	( )	( )	123
122. Would you say that 4 or 5 drinks affect your driving?	( )	( )	124
123. Even when you're bombed, can you still drive home safely?	( )	( )	125
124. I feel tense and anxious most of the time.	( )	( )	126
125. Are you often bored and restless?	( )	( )	127
126. Do you have trouble sleeping?	( )	( )	128
127. About *how many* dreams have you had in the last three months?	(#		129
128. *How many* times have you been admitted to a hospital?	(#		130
129 There is very little a person like myself can do to reduce his chances of being in an automobile crash.	( )	( )	131
130. More and more I feel helpless in the face of what's happening in the world today.	( )	( )	132
131. Sometimes I feel all alone in the world.	( )	( )	133
132. Many times I feel that I have little influence over the things that may happen to me while driving.	( )	( )	134
133. Most people live lives of quiet desperation.	( )	( )	135
134. Do you have any relatives who are severely emotionally disturbed?	( )	( )	136
135. A man who can't hold his liquor is not a man at all.	( )	( )	137

Appendix E

FORM B

CLIENT INTERVIEW

DIRECTIONS FOR INTERVIEWER:

For each item record your judgment by:

1. Circle Y if yes, N if no
2. Place appropriate number in space
3. In the last column:
   a. Draw vertical line ( ) if question is not applicable
   b. Write (R) if client refuses to respond

All items printed in large type are to be asked of the client. Items printed in small type are to be filled in only if applicable and mentioned by the client.

If the respondent does not understand, feel free to rephrase the questions. In the cases where you feel that the respondent is evading the question, you may cautiously inquire, "Can you tell me (more) about it?" or "How much of a problem is this for you?" However, once you have sufficient information to answer the question on your interview form, move on to the next question.

All items should be answered.

Appendix E

Serial # _____ 1

FORM B 2

CLIENT INTERVIEW

I.D. # _____/_____/_____/_____/_____ 3
Driver's License Number

Operator _____ 4

Chauffeur _____ 5

If license # is unavailable write out full name:

6

_____
First Middle Last

Sex: Male_____ Female_____ 7

Date of birth: _____/___/____ 8
month day year

How old were you when you first got a driver's license? _____ 9
age

About how many miles per year have you driven during the past year? _____ 10
miles/year

Place of Interview_____ 11

Date of Interview_____ 12

Interviewer_____ 13

(In order to retain the confidentiality of this interview, this page will be removed and kept in a locked file.)

Serial # _____ (14)

Not applicable or refused to respond [I] [R]

1. How old are you?	Yrs.	___	___	___	15
How much do you weigh?	Lbs.	___	___	___	16
What is your national origin? _____					17
Are you a member of a religious group?		Y	N	___	18
(If yes): What religion? _____					
2. How is your general health? _____		_____		___	19
(Put appropriate # in space)		1,2,3			
1. better than average or very good, excellent					
2. average or good					
3. less than average, fair, poor, bad					
(If less than average): What are the problems?					
_____					
_____		_____		___	20
The client complains of:					
a. being tired or fatigued		Y	N	___	21
b. general weakness		Y	N	___	22
c. just feeling bad all over		Y	N	___	23
d. weight loss or inability to eat		Y	N	___	24
e. inability to concentrate		Y	N	___	25
f. difficulty sleeping		Y	N	___	26
g. increased irritability		Y	N	___	27
h. difficulty doing his job or taking care of his home .		Y	N	___	28
3. Do you have a chronic disease or illness?		Y	N	___	29
(If yes): What? _____					
_____		_____		___	30
Was any disease mentioned spontaneously?		Y	N	___	31
Inquire about the following:					
a. fatty liver		Y	N	___	32
b. cirrhosis		Y	N	___	33
c. pain and/or weakness of legs		Y	N	___	34
d. fluid in the abdomen (ascites)		Y	N	___	35
e. anemia		Y	N	___	36
f. convulsions or epilepsy		Y	N	___	37
g. diabetes		Y	N	___	38
h. ulcers or stomach problems		Y	N	___	39
i. hepatitis		Y	N	___	40
j. mental or emotional illness		Y	N	___	41
k. any severe bleeding problems		Y	N	___	42
l. pancreatitis		Y	N	___	43

			Not applicable or refused to respond	
4. Are you disabled or do you have any physical defect? . . (If yes): What?_____	Y	N	___	44
_____	____		___	45
Does the handicap limit his adjustment or ability to perform:				
a. in his job situation	Y	N	___	46
b. in friendships or in a social setting	Y	N	___	47
c. in his family situation	Y	N	___	48
Has the client made an adequate emotional adjustment to the handicap?	Y	N	___	49
Is the client using the handicap as an excuse for drinking or as an excuse for family or job problems?	Y	N	___	50
5. Have you had a serious injury or illness in the past? (If yes): What was its nature?_____	Y	N	___	51
_____	____		___	52
If any of the diseases listed in Q.3 are mentioned here, record in Q.3.				
Are you completely well from this?	Y	N	___	53
INTERVIEWER PLEASE NOTE: QUESTIONS # 6-10 ARE ONLY TO BE USED WITH COURT SAMPLES OR PERSONS IN PENAL INSTITUTIONS, FOR OTHERS, PLEASE CHECK THE BLANK AT RIGHT	____		___	54
6. Can you tell me about the arrest. When did it happen and what happened? _____				
_____				
_____	____		___	55
What time did the arrest occur?	___	___	___	56
What time did the client say he was arrested?	___	___	___	57
There is more than an hour difference between the Police report and client's report	Y	N	___	58
7. How much did you have to drink before you were arrested and what were you drinking? _____	____		___	59
_____				
1. client gives an exact number of drinks 2. client gives an approximate number of drinks 3. client is unable to give a figure	____		___	60
Number of drinks: . . . . . (Put appropriate # in space)	____		___	61
1. four or less 2. five or six 3. seven or more				

			Not applicable or refused to respond	
What was the kind of liquor? . . . . . (Put appropriate # in space)			____	62
1. beer 2. wine 3. mixed drink 4. combination of the above 5. unknown 6. other _____			____	63
Do you believe this amount is accurate?	Y	N	____	64

8. How long did it take you to drink this? (hrs/day)

_____

Was there more than an hour between the time he stopped drinking and the arrest?	Y	N	____	65
The time the client spent drinking was: . . . . . (Put appropriate # in space)			____	66
1. under 2 hrs. 2. 2-4 hrs. 3. 4-8 hrs. 4. all day or longer				

9. What were you doing that called you to the attention of the police?

_____ ____ 67

_____

Specific behaviors mentioned:				
a. drunk or impaired driving	Y	N	____	68
b. car accident	Y	N	____	69
c. asleep in or near car	Y	N	____	70
d. fighting or argument	Y	N	____	71
e. staggering	Y	N	____	72
f. molesting or bothering people	Y	N	____	73
g. breaking probation	Y	N	____	74
h. noise making	Y	N	____	75
i. other _____			____	76
You would estimate that at the time of arrest the person was:			____	77
1. high or feeling good but still in reasonable control 2. moderately intoxicated: some speech impairment, swaying, difficulty with fine hand movements 3. severely intoxicated: marked speech impairment, stagger, or inability to walk				
Does the person seem to remember the events of the arrest well?	Y	N	____	78
Do you feel that he was in a blackout at the time of arrest?	Y	N	____	79
Does his description of the arrest correspond well to the description given in the police report?	Y	N	____	80

			Not applicable or refused to respond	
10. How do you feel now about being arrested?				
_____			___	81
He feels that the behavior which led to his arrest was wrong	Y	N	___	82
He feels that alcohol contributed to his deviant behavior .	Y	N	___	83
He expresses anger or hostility toward the police or court.	Y	N	___	84
He appears to accept the arrest without much feeling . . .	Y	N	___	85
He expresses the hope that this arrest pattern will not be repeated	Y	N	___	86
He expresses the need for help in order to avoid future arrest	Y	N	___	87
Interviewers' conclusions:				
Do you feel that this drinking situation was unique and unlikely to happen again?	Y	N	___	88
Did the client give you any evidence of a past behavior pattern of heavy drinking?	Y	N	___	89
Do you feel that without any therapeutic intervention he is likely to repeat this drinking behavior within the next five years?	Y	N	___	90
FOR ALL SUBJECTS CONTINUE HERE				
11. Have you ever been arrested for driving under the influence of liquor or for impaired driving?	Y	N	___	91
(If yes): How many times?	#	_____	___	92
12. Have you ever been arrested for being drunk and disorderly or for public intoxication?	Y	N	___	93
(If yes): How many times?	#	_____	___	94
Was driving related to any of these?	Y	N	___	95
(If yes): In how many instances?	#	_____	___	96
13. Have you ever been arrested for reckless driving? . . .	Y	N	___	97
(If yes): How many times?	#	_____	___	98
Was this ever reduced from the original charge?. .	Y	N	___	99
(If yes): What was the original charge? _____		_____	___	100
Was the original charge DUIL or impaired ?_____		_____	___	101
14. Have you ever been arrested for anything else?	Y	N	___	102
(If yes): How many times and for what?_____	#	_____	___	103
(List the charges only if mentioned, plus the number of times charged)				
Kinds of offenses (Plus # for each; put "00" if none, put "01" if one)				
Crimes involving property	#	_____	___	104
Crimes of personal assault	#	_____	___	105
Crimes involving sex	#	_____	___	106
Other (list)_____				

Not applicable or refused to respond

#15 & #16 TO BE ASKED IF CLIENT HAS PREVIOUS RECORD

15. How old were you at the time of your first arrest? Yrs. ___ ___ ___ 107

How long has it been since your last arrest (Mo/Yr)? (The arrest previous to the current arrest) . . . . . ___ ___ ___ 108

16. Are you currently on probation? . . . . . Y N ___ 109
(If yes): Is non-drinking part of the probation? . . Y N ___ 110

17. How many traffic tickets have you received in the past two years? Do not include parking tickets or faulty equipment tickets . . . . . # _____ ___ 111

While driving, have you ever been stopped by police, but not ticketed, when you knew you had been drinking too much? . . . . . Y N ___ 112

18. Has your driver's license ever been suspended or revoked in Michigan or any other state? . . . . . Y N ___ 113
(If yes): How many times? . . . . . # _____ ___ 114
Do you have a valid license now? . . . . . Y N ___ 115
Was drinking related to the suspension(s) or revocation(s)? . . . . . Y N ___ 116

19. Do you feel that your drinking is causing any problems in your life? . . . . . Y N ___ 117
(If yes): Can you tell me what these problems are?

_____

_____ _____ ___ 118

Problems mentioned:

a. marriage . . . . . Y N ___ 119
b. job or employment . . . . . Y N ___ 120
c. health . . . . . Y N ___ 121
d. court . . . . . Y N ___ 122
e. other (list) _____ ___ 123

20. Do you feel that you always drink like a social drinker? Y N ___ 124
(If no): When and how do you differ from the social drinker? _____

_____ _____ ___ 125

Differs from a social drinker in the following ways:

a. drinks more frequently . . . . . Y N ___ 126
b. drinks greater quantity when he drinks . . . . . Y N ___ 127
c. feels worse after drinking . . . . . Y N ___ 128
d. has a compulsion to drink . . . . . Y N ___ 129
e. drinks at unusual times . . . . . Y N ___ 130
f. other _____ _____ ___ 131

			Not applicable or refused to respond	
21. Do you ever find that you drink more than you had intended to drink?	Y	N	___	132
(If yes): Do you ever get drunk without intending to?	Y	N	___	133
22. Do you usually drink every day?	Y	N	___	134
(If no): How many times a week do you usually drink?	#___		___	135
If every day record 7; if less than once a week record 1; if weekends only record 2.				
23. Do you usually drink four or more drinks at one sitting?	Y	N	___	136
What kind of drinks are these?				
_____ (double martini, boilermaker, straight shots, etc.)	___		___	137
24. Where do you usually do your drinking?				
a. own home	Y	N	___	138
b. friend's home	Y	N	___	139
c. party	Y	N	___	140
d. bar or lounge	Y	N	___	141
e. restaurant	Y	N	___	142
f. other (list)_____				143
25. Have you gone on a drinking spree or binge in the last five years?	Y	N	___	144
26. Do you ever get the feeling that you "NEED" or "REALLY WANT" a drink?	Y	N	___	145
(If yes): When do these feelings occur?_____	___		___	146
Has it ever happened after you have gone to bed?	Y	N	___	147
Do you ever feel this way before noon?	Y	N	___	148
Client states he needs a drink when:				
a. angry	Y	N	___	149
b. depressed	Y	N	___	150
c. lonely	Y	N	___	151
d. happy	Y	N	___	152
e. tense or nervous	Y	N	___	153
f. with friends	Y	N	___	154
g. things go wrong	Y	N	___	155
h. at parties	Y	N	___	156
i. at certain times of day	Y	N	___	157
j. other (list) _____	___		___	158
27. Have you ever hidden a bottle of liquor?	Y	N	___	159
28. Do you drink to feel less self-conscious and more at ease around people?	Y	N	___	160
29. Do you ever feel that it is easier to start something after you have had a drink?	Y	N	___	161
30. Does drinking sometimes give you courage or self-confidence?	Y	N	___	162

				Not applicable or refused to respond	
31.	Do you feel more quarrelsome or angry after you have had several drinks?	Y	N	___	163
32.	Have you been told that you become rowdy or noisy when you have had too much to drink?	Y	N	___	164
33.	Have you ever destroyed property or gotten into a physical fight when you were drinking?	Y	N	___	165
34.	Have you ever thought about cutting down on your drinking?	Y	N	___	166
	(If yes): Have you ever stopped drinking for a period of time?	Y	N	___	167
35.	Have you ever felt bad or guilty about your drinking?	Y	N	___	168
36.	Have any of your friends or members of your family suggested that you watch or cut down on your drinking? . .	Y	N	___	169
37.	Have you ever been treated for drinking?	Y	N	___	170
38.	Have you ever taken medicine or pills other than aspirin to help sober up?	Y	N	___	171
39.	Have you ever found that you can't remember or wonder what you did the night before when you were drinking?.	Y	N	___	172
40.	Did you ever fall or seriously injure yourself when you were drinking?	Y	N	___	173
41.	After drinking the night before, have you ever decided not to go to work the next morning?	Y	N	___	174
	(If yes): Does this happen more than twice a year? . .	Y	N	___	175
42.	Have you ever found that your hands shake and tremble in the morning?	Y	N	___	176
	(If yes): Does a drink help this to go away?	Y	N	___	177
43.	Have you ever vomited or been very sick to your stomach, not while drinking, but the morning after drinking?. .	Y	N	___	178
44.	Do you ever drink in the morning before breakfast or before going to work?.	Y	N	___	179
45.	Do you feel that your health would be better if you decreased or stopped your drinking?	Y	N	___	180
46.	Do you take sleeping pills?	Y	N	___	181
	(If yes): Do you take more now than you did a year ago?	Y	N	___	182

			Not applicable or refused to respond	
47. Do you ever take tranquilizers, anti-depressant or pep-up pills?	Y	N	___	183
(If yes): Do you take these regularly or only when you need them? (Put appropriate # in space) 1. regularly 2. when needed	1 or 2		___	184
Are you taking more of these now than when you first started taking them?	Y	N	___	185
48. Have you ever been told that your drinking was injuring your liver?	Y	N	___	186
49. Have you ever had bad stomach or abdominal pain?	Y	N	___	187
(If yes): Did this occur after drinking?	Y	N	___	188
50. In the past two years, how often did you go to your doctor or the emergency room because you injured yourself?	_____		___	189
(If one or more times): Had you been drinking when this happened?	Y	N	___	190

FOR THE FOLLOWING QUESTION, READ THE POSSIBLE CATEGORIES TO CLIENT

51. What is your marital status? (Put corresponding # in space) 1. married 2. single 3. widowed 4. separated 5. divorced	_____		___	191
(If married): How long have you been married?	Yrs. ___	___	___	192
Do you and your wife/husband get along pretty well?	Y	N	___	193
Do you ever have arguments about drinking?	Y	N	___	194
Do you have any children?	Y	N	___	195
(If yes): How many children do you have at home?	# _____		___	196
Do you have any problems with your children?	Y	N	___	197
Are there any other family problems?	Y	N	___	198
Have you ever been married before?	Y	N	___	199
(If single): Have you ever been married?	Y	N	___	200
(If widowed): For how long?	Yrs. ___	___	___	201
Has your drinking increased since you lost your (wife/husband)?	Y	N	___	202

			Not applicable or refused to respond	
(If separated or divorced):				
Did you have family arguments over drinking? . . .	Y	N	___	203
Has your drinking increased since the separation or divorce?	Y	N	___	204
Were there any children?	Y	N	___	205
52. Are you presently employed?	Y	N	___	206
(If yes): What is your present job? (Title plus description) _____				
_____ (Such as carpenter, clerk in grocery store, etc.)			___	207
How long have you had this job? . . . . . Yrs.			___ ___	208
How good do you think your work is at your present job? (Put appropriate # in space)			___	209
1. excellent 2. good 3. fair or poor				
(If no): How long have you been unemployed? . . . . Mo.			___	210
Why did you lose your previous job? _____			___	211
Or: Why are you unemployed? _____			___	212
Reason for unemployment:				
a. laid off previous job	Y	N	___	213
b. fired	Y	N	___	214
c. strike	Y	N	___	215
d. illness	Y	N	___	216
e. other _____				
Did drinking contribute to your job loss? . . .	Y	N	___	217
How do you spend your time now? _____				218
a. working at part-time jobs	Y	N	___	219
b. working around his home	Y	N	___	220
c. in family activities	Y	N	___	221
d. drinking in his home	Y	N	___	222
e. drinking at bars or lounge	Y	N	___	223
f. other _____			___	224
53. Have you ever been fired?	Y	N	___	225
54. How far did you go in school?			___	226
Grammar School 1-8 yrs College 13-16			No. Yrs.	
High School 9-12 yrs Graduate work: 17+				
55. Do you ever want to talk with someone but don't know whom to call?	Y	N	___	227
56. Would you describe yourself as being lonely a good deal of the time?	Y	N	___	228

			Not applicable or refused to respond	
57. Do you feel that your life is difficult to manage and you are not sure how to straighten it out?	Y	N	___	229
(If yes): Would you like us to give you some information about where you may obtain help?	Y	N	___	230
Interviewer's initial diagnosis:				
Drinking pattern:				
1. has client previously exhibited a pattern of controlled drinking?	Y	N	___	231
2. how experienced is this person at drinking? (select a value from 1, very inexperienced to 5 very experienced)				
Example: Inexperienced 1, 2, 3, 4, 5 experienced drinker				
(Put appropriate # in space)	____		___	232
Drinking diagnosis:				
1. client is an abstainer				
2. client is an inexperienced maladaptive drinker				
3. client is a social drinker				
4. client is a heavy social drinker				
5. client is a pre-alcoholic (dependent on alcohol but life resources still relatively intact)				
6. client is an alcoholic				
(Put appropriate # in space)	____		___	233
Problem diagnosis:				
1. client has no problems related to drinking				
2. client doesn't show a pattern of problem drinking in relation to society				
3. client shows a pattern of problem drinking in relation to society				
(Put appropriate # in space)	____		___	234
Interviewer's physical observation of client:				
a. looks older than stated age	Y	N	___	235
b. looks younger than stated age	Y	N	___	236
c. looks ill	Y	N	___	237
d. smells of alcohol	Y	N	___	238
e. has a hand tremor	Y	N	___	239
f. has bloodshot or glassy eyes	Y	N	___	240
g. has flushed face	Y	N	___	241
h. has language difficulty	Y	N	___	242
i. appears to be markedly below average intelligence.	Y	N	___	243

			Not applicable or refused to respond	
58. How old were you when you first started drinking?			____	244
59. Do you feel that you are a problem drinker?	Y	N	___	245

REFERENCES

Alcoholics Anonymous, Alcoholics Anonymous World Services, Inc., 1955.

Alexander, C.S. Idiopathic Heart Disease. Analysis of 100 Cases with special Reference to Chronic Alcoholism. Amer. J. Med. 41:213-228, 1966.

Alexander, C.S. Idiopathic Heart Disease. Electron Microscopic Examination of Myocardial Biopsy Specimens in Alcoholic Heart Disease. Amer. J. Med. 41:229-234, 1966.

Aspects of Alcoholism, Vol. 2, J.B. Lippincott and Co., Philadelphia, 1966.

Barchha, R. Stewart, M.A. and Guze, S.B. The Prevalence of Alcoholism Among General Hospital Ward Patients. Amer. J. Psychiat. 125:681-684, 1968.

Barmack, J.E. and Payne, E.D. Injury Producing Private Motor Vehicle Accidents Among Airmen. Bulletin 285, Highway Research Board, 1961.

Bates, R.C. The Diagnosis of Alcoholism. Appl. Ther. 1965, 1966.

Bellows, R.M. and Estep, M.F. Employment Psychology: The Interview. Holt, Rinehart & Winston, New York, 1954.

Bingham, W.V.D. Moore, B.V. and Gustad, J.V., 4th ed. How to Interview, Harper & Brothers, New York, 1959.

Bingham, W.V. Today and Yesterday. Personnel Psychol. 2:267-275, 1949

Birrell, J. Blood Alcohol Levels in Drunk Drivers, Drunk and Disorderly Subjects and Moderate Social Drinkers. Med. J. Aust. 6:949-953, 1965.

Bjerver, K.B. Goldberg, L. and Linde, P. Blood Alcohol Levels in Hospitalized Victims of Traffic Accidents. Proceedings, 2nd Int. Conf. Alc. Rd. Traffic, Sept. 1953, Toronto. Garden City Press Cooperative, Toronto, 1955.

Bolster, B.I. and Springbett, B.M. The Reaction of Interviewers to Favorable and Unfavorable Information. J. Appl. Psychol. 45:97-103, 1961.

Borg, E. and Moller, A.R. Effect of Ethyl Alcohol and Pentobarbital Sodium on the Acoustic Middle Ear Reflex in Man. Acta Oto-Laryng., 64:415-426, 1967.

Borkenstein, R.F. Crowther, R.F. Shumate, R.P. Ziel, W.B. and Zylman, R. The Role of the Drinking Driver in Traffic Accidents. Department of Police Administration, Indiana University, Bloomington, 1964.

Brown, S.L. Bohnert, P.J. Finch, J.R. Pokorny, A.D. and Smith, J.P. Alcohol Safety Study; Drivers Who Die, Baylor University College of Medicine, Houston, 1968.

Cahalan, D. Problem Drinkers; A National Survey, Jossey-Bass, Inc., San Francisco, 1970.

Cahalan, D. and Cisin, I.H. American Drinking Practices: Summary of Findings from a National Probability Sample. I. Extent of Drinking by Population Subgroups. Quart. J. Stud. Alc., 29:130-151, 1968.

Carroll, J.L. and Fuller, G.B. The Self and Ideal-Self Concept of the Alcoholic as Influenced by Length of Sobriety and/or Participation in Alcoholics Anonymous. J. Clin. Psychol., 25:363-364, 1969.

Carson, D.J. Pathologic Findings Following Alcohol. Anesth. Analg., 48:670-675, 1969.

Chafetz, M.E. Clinical Syndromes of Liquor Drinkers, Alcohol and Alcoholism, University of Toronto Press, Toronto, 1970.

Cisin, I.H. and Cahalan, D. A Comparison of Abstainers and Heavy Drinkers in a National Survey. American Psychiatric Association, Annual Meeting, Washington, D. C., 1966.

Clark, W. Operational Definitions of Drinking Problems and Associated Prevalence Rates. Quart. J. Stud. Alc., 27:648-688, 1966.

Coldwell, B. and Grant, G.L. Some Characteristics of Suspected Drinking Drivers. Proceedings, 3rd Int. Conf. Alc. Rd. Traffic, Sept. 3-7, 1962, London. London British Medical Association, 1963.

Crancer, A., Jr. and Quiring, D.L. The Chronic Alcoholic as a Motor Vehicle Operator. Northwest Med., 68:42-47, 1969.

Curlee, J. Alcoholism and the 'Empty Nest'. Bull. Menninger Clin., 33:165-171, 1969.

Drew, L.R. Alcoholism as a Self-Limiting Disease. Quart. J. Stud. Alc., 29:956-967, 1968.

Dunnette, M.D. and Bass, B.M. Behavioral Scientists and Personnel Management. Industr. Relations, 2:115-130, 1963.

Eelkema, R.C. Brosseau, J. Koshnick, R. et al. A Statistical Study on the Relationship Between Mental Illness and Traffic Accidents--A Pilot Study. Amer. J. Public Health, 60:459-469, 1971.

English, O. and Finch, S. Introduction to Psychiatry. W.W. Norton and Co., Inc., New York, 1964.

Fear, R. The Evaluation Interview: Predictions of Job Performance. McGraw-Hill, New York, 1958.

Filkins, L.D. and Geller, N.K. (ed.) Proceedings of a Conference on Community Response to Alcoholism and Highway Crashes, Highway Safety Research Institute, University of Michigan, Ann Arbor, 1970.

Filkins, L. D. Clark, C.D. Rosenblatt, C.A. Carlson, W.L. Kerlan M.W. and Manson, H. Alcohol Abuse and Traffic Safety: A Study of DWI Offenders, Alcoholics and Court Related Treatment Approaches, Highway Safety Research Institute, University of Michigan, Ann Arbor, 1970.

Foulks, J.D. and Webb, J.T. Temporal Orientation of Diagnostic Groups. J. Clin. Psychol., 26:155-159, 1970.

Freed, E.X. Interpersonal Values of Hospitalized Alcoholic Psychiatric Patients. Psychol. Rep., 22:403-406, 1968.

Garrett, A. Interviewing, Its Principles and Methods. Family Service Association of America, New York, 1950.

Gillespie, J.A. Vasodilator Properties of Alcohol. Brit. Med. J., 2:274-277, 1967.

Goldberg, L. Drunken Drivers in Sweden. Proceedings, 2nd Int. Conf. Alc. Rd. Traffic, Sept. 1953, Toronto. Garden City Press Cooperative, Toronto, 1955.

Goldberg, L. Quantitative Studies on Alcohol Tolerance in Man. The Influence of Ethyl Alcohol on Sensory, Motor and Psychological Functions Referred to Blood Alcohol in Normal and Habituated Individuals. Acta Physical. Scand. 5 (Suppl. 16) 1-128, 1943.

Goldberg, L. Tolerance to Alcohol in Moderate and Heavy Drinkers and Its Significance to Alcohol and Traffic. Proceedings 1st Int. Conf. Alc. Rd. Traffic, 30 Aug.-1 Sept., 1950, Stockholm. Kugelbergs, Boktryckeri, Stockholm, 1951.

Goodwin, D.W., et al. Alcoholic 'Blackouts': A Review and Clinical Study of 100 Alcoholics. Amer. J. Psychiat., 126:191-198, 1969.

Gorden, R.L. Interviewing Strategy, Techniques, and Tactics. The Dorsey Press, Homewood, Ill., 1969.

Green, J.R. The Incidence of Alcoholism in Patients Admitted to Medical Wards of a Public Hospital. Med. J. Aust., 1:465-466, 1965.

Guilford, J.P. Psychometric Methods. McGraw Hill, New York, 1954.

Guze, S.B., et al. The Drinking History: A Comparison of Reports by Subjects and Their Relatives. Quart. J. Stud. Alc., 249-260, 1963.

Guze, S.B. Tuason, V.B. Gatfield, P. Stewart, M.A. and Picken, B. Psychiatric Illness and Crime with Particular Reference to Alcoholism: A Study of 223 Criminals. J. Nerv. Ment. Dis., 134:512-521, 1962.

Haertzen, C.A. Hooks, N.T. Monroe, J.J. et al. Nonsignificance of Membership in Alcoholics Anonymous in Hospitalized Alcoholics. J. Clin. Psychol., 24:99-103, 1968.

Harrison, T.R. Principles of Internal Medicine. (5th Ed.), McGraw-Hill Book Co., New York, 1966.

Hart, R.H. The "Saturday Night Syndrome". Canad. Med. Assn. J., 100:779, 1969.

Highway Safety Research Institute, Final Report, Alcohol Safety, Vol. 1, University of Michigan, Ann Arbor, 1969.

Hill, H.E. Haertzen, C.A. Walback, A.B., Jr. and Miner, E.G. The Addiction Research Center Inventory: Standardization of Scales Which Evaluate Subjective Effects of Morphine, Amphetamine, Penobarbital, Alcohol, LSD-25, Pyrahexyl and Chlorpromazine. Psychopharmacologia, 4:167-183, 1963.

Holcomb, R.L. Alcohol in Relation to Traffic Accidents. JAMA, 11:1076, 1938.

Hollingworth, H.L. Vocational Psychology and Character Analysis. D. Appleton, New York, 115-119, 1923.

Horn, J.L. and Wanberg, K.W. Symptom Patterns Related to Excessive Use of Alcohol. Quart. J. Stud. Alc., 30:35-58, 1969.

Horsey, W. and Akert, K. The Influence of Ethyl Alcohol on the Spontaneous Electrical Activity of the Cerebral Cortex and Subcortical Structures of the Cat. Quart. J. Stud. Alc., 14:363-377, 1953.

Hovland, C.I. and Wonderlic, E.F. Prediction of Success from a Standardized Interview. J. Appl. Psychol., 33:537-546, 1939.

Hunter, G. Alcoholism and the Family Agency. Quart. J. Stud. Alc., 24:61-79, 1963.

Jellinek, E.M. The Disease Concept of Alcoholism. Hillhouse Press, New Jersey, 1960.

Jellinek, E.M. Estimating the Prevalence of Alcoholism: Modified Values in the Jellinek Formula and an Alternative Approach. Quart. J. Stud. Alc., Vol. 20, 1959.

Jellinek, E.M. Phases of Alcohol Addiction. Quart. J. Stud. Alc., 13:673-684, 1952.

Johnson, L.C. Burdick, J.A. and Smith, J. Sleep During Alcohol Intake and Withdrawal in the Chronic Alcoholic. Arch. Gen. Psychiat., 22:406-418, 1970.

Jones, M.C. Personality Correlates and Antecedents of Drinking Patterns in Adult Males. J. Con. Clin. Psychol., 32:2-12, 1968.

Kaestner, N. Howard, V. and Warmoth, E. Oregon Study of Drinking Drivers. Motor Vehicles Division, Oregon Department of Transportation, Salem, 1969.

Kahn, R.L. and Cannell, C.F. The Dynamics of Interviewing, Theory, Technique and Cases. John Wiley & Sons, Inc., London, 1957.

Kearney, T.R. Bonime, H. and Cassimatis, G. The Impact of Alcoholism on a Community General Hospital. Community Ment. Health J., 3:373-376, 1967.

Keating, E. Patterson, D.G. and Stone, H.C. Validity of Work Histories Obtained by Interview. J. Appl. Psychol., 34: 6-11, 1950.

Keller, M. and McCormick, M. A Dictionary of Words About Alcohol. Rutgers Center of Alcohol Studies, Pub. Div., New Jersey, 1968.

Kirkpatrick, J.R. Blood Alcohol Levels of Home Accident Patients. Quart. J. Stud. Alc., 28:734-737, 1967.

Kerr, A., Jr. Myocardiopathy, Alcohol, and Pericardial Effusion. Arch. Intern. Med., 119:617-619, 1967.

Klinkerfuss, G. Bleisch, V. Dioso, M.M. and Perkoff, G.T. A Spectrum of Myopathy Associated with Alcoholism. II. Light and Electron Microscopic Observations. Ann. Intern. Med., 67:493-510, 1967.

Koller, K.M. and Castanos, J.N. Family Background and Life Situation in Alcoholics. A Comparative Study of Parental Deprivation and Other Features in Australians. Arch. Gen. Psychiat., 21:602-610, 1969.

Lieber, C.S. Robin, E. and DeCarli, L.M. Respective Role of Dietary and Metabolic Factors in the Pathogenesis of the Alcoholic Fatty Liver: The Biochemical Basis for the Ethanol-Induced Liver Injury, Biochemical and Chemical and Clinical Aspects of Alcohol Metabolism. Edited by V.M. Sardesai, Charles C. Thomas, Springfield, Ill., 176-188, 1969.

Little, J.W. Michigan Driver Profile. Highway Safety Research Institute, University of Michigan, Ann Arbor, 1968.

Lucas, G.H.W. Kalow, W. McColl, J.D. Griffith, B.A. and Smith, H.W. Quantitative Studies of the Relationship Between Alcohol Levels and Motor Vehicle Accidents. Proceedings, 2nd Int. Conf. Alc. Rd. Traffic, Sept., 1953, Toronto. Garden City Press Cooperative, Toronto, 1955.

MacAndrew, G. Self Reports of Male Alcoholics: A Dimensional Analysis of Certain Differences from Nonalcoholic Male Psychiatric Outpatients. Quart. J. Stud. Alc., 21:43-51, 1967.

McCarroll, J.R. and Haddon, W., Jr. A Controlled Study of Fatal Automobile Accidents in New York City. J. Chron. Dis., 15:811-826, 1961.

McDermott, P.H. et al. Myocardosis and Cardiac Failure in Men. JAMA, 198:253-256, 1966.

McMurrey, R.N. Validating the Patterned Interview. Personnel, 23:270-271, 1947.

Marjot, D.H. The Length of the Drinking Bout Preceding Alcohol Withdrawal States. Brit. J. Addict., 64:307-13, 1970.

Maxwell, M.A. Early Identification of Problem Drinkers in Industry. Quart. J. Stud. Alc., 21:655-678, 1960.

Mayfield, E.C. The Selection Interview--A Re-Evaluation of Published Research. Personnel Psychol., 17:239-260, 1964.

Michigan Traffic Accident Facts. Department of State Police, Lansing, Michigan, 1969.

Morris, N. Alcoholism in Relation to Crime and Punishment. In Alcoholism, Foundation for Research and Treatment of Alcoholism, Sydney, p. 152, 1960.

Mortimer, R.G. and Lower, J.S. Development of a Driver Alcoholism Test. Highway Safety Research Institute, University of Michigan, Ann Arbor, 1970 (unpublished document).

Mortimer, R.G. and Lower, J.S. Development of a Questionnaire to Identify the Problem-Drinking Driver. Amer. Assoc. for Automotive Medicine, Annual Meeting, Ann Arbor, 1970.

Nathan, P.E. Titler, N.A. Lowenstein, L.M. et al. Behavioral Analysis of Chronic Alcoholism. Interaction of Alcohol and Human Contact. Arch. Gen. Psychiat., 22:419-30, 1970.

Nestch, P.J. Some Clinical and Chemical Manifestations of Alcohol-Induced Hyperlepaemia. Aust. Ann. Med., 16:139-143, 1967.

Nolan, J.P. Alcohol as a Factor in the Illness of University Service Patients. Amer. J. Med. Sci., 249:135-142, 1965.

Ott, B. Paralysis Due to Nerve Pressure "Without" Trauma. Landarzt., 42:1632-1635, 1966.

Pashalian, S. and Crissy, W.J.E. The Interview, IV. The Reliability and Validity of the Assessment Interview as a Screening and Selection Technique in the Submarine Service. MLR Report No. 216, Vol. 12, 1953.

Park, P. Problem Drinking and Social Orientation. Doctoral Dissertation, Yale Univ., 1958.

Parker, F.B. Self-Role Strain and Drinking Disposition at a Prealcoholic Age Level. J. Soc. Psychol., 78:55-61, 1969.

Pearson, W.S. The "Hidden" Alcoholic in the General Hospital. N. Carolina Med. J., 23:6-10, 1962.

Pelz, D.C. and Schuman, S.H. What is the Dangerous Age for Young Drivers? Traffic Safety, 70:24-36, 1970.

Perkoff, G.T. Dioso, M.M. Bleisch, V. and Klinkerfuss, G. A Spectrum of Myopathy Association with Alcoholism. I. Clinical and Laboratory Features. Ann. Intern. Med., 67: 481-492, 1967.

Perman, E.S. The Effect of Ethyl Alcohol on the Secretion from the Adrenal Medulla in Man. Acta Physiol. Scand., 44: 241-247, 1958.

Pittman, D.J. The Chronic Drunkenness Offenders: An Overview. In The Court and the Chronic Inebriate, Dept. of Health, Education and Welfare, Washington, D.C., 1965.

Plaut, T.F. Alcoholism and Community Caretakers: Programs and Policies. Soc. Work , 12:42-50, 1967.

Pollack, S. Drinking Driver and Traffic Safety Project. Vol. I & II, Public Systems Research Institute, University of Southern California, Los Angeles, 1969.

Rhodes, R.J. The MacAndrew Alcoholism Scale-A Replication. Clin. Psychol., 25:189-91, 1969.

Rich, C.C. and Davis, H.G. Concurrent Validity of MMPI Alcoholism Scales. J. Clin. Psychol., 25:425-6, 1969.

Richardson, G.A. et al. Interviewing, Its Forms and Functions. Basic Books, Inc., New York, 1965.

Roman, P.M. and Trice, H.M. The Development of Deviant Drinking Behavior. Occupational Risk Factors. Arch. Environ. Health, 20:424-35, 1970.

Rosenberg, N. Comparative Validity for a Composite MMPI Alcoholism Key. American Psychological Association, Annual Meeting, Miami Beach, 1970.

Rushing, W.A. Suicide and the Interaction of Alcoholism (Liver Cirrhosis) with the Social Situation. Quart. J. Stud. Alc., 30:93-103, 1969.

Saker, B.M. Tofler, O.B. Burvill, M.J. and Reilly, K.A. Alcohol Consumption and Gout. Med. J. Aust., 1:1213-1216, 1967.

Schaffarzick, R. Anti-Convulsive Action of Isopropyl Alcohol. Proc. Soc. Exp. Biol., 74:211-215, 1950.

Schmidt, W.S. and Smart, R.G. Alcoholics, Drinking and Traffic Accidents. Quart. J. Stud. Alc., 20:631-644, 1959.

Selzer, M. Payne, C.E. Gifford, J.D. and Kelly, W.L. Alcoholism, Mental Illness and the "Drunk Driver." Amer. J. Psychiat., 120:326-331, 1963.

Selzer, M.L. and Weiss, S. Alcoholism and Traffic Fatalities: Study in Futility. Amer. J. Psychiat., 122:762-767, 1966.

Selzer, M.L. Payne, C.E. Westervelt, F.H. and Quinn, J. Automobile Accidents as an Expression of Psychopathology in an Alcoholic Population. Quart. J. Stud. Alc., 28:505-516, 1967.

Selzer, M.L. The Quest for a New Diagnostic Instrument. American Psychiatric Association, Annual Meeting, San Francisco, Calif., May 11-15, 1970.

Siegel, L. Industr. Psychol. Revised Edition. Richard D. Irwin, Homewood, Ill., 1969.

Smart, R.G. Future Time Perspectives in Alcoholics and Social Drinkers. J. Abnormal Psychol., 73:81-83, 1968.

Smart, R.G. and Schmidt, W. Responsibility, Blood Alcohol Levels, and Alcoholism. Traff. Safety Res. Rev., 11:112-116, 1967.

Smith, F. Blood Alcohol Level and Other Selected Factors As Indicators of the Problem Drinking Driver. (Ph.D. Thesis), Michigan Department of Secondary Education and Curriculum, Michigan State University, 1970.

Springbett, B.M. Factors Affecting the Final Decision in the Employment Interview. Canad. J. Psychol., 12:13-22, 1958.

Sullivan, H.S. The Psychiatric Interview. W.W. Norton and Co., New York, 1954.

Sullivan, J.F. et al. Myocardiopathy of Beer Drinkers: Subsequent Course. Ann. Intern. Med., 70:277-282, 1969.

Thelin, M.H. Modalites Clinques et Recherches de Laboratorie dans les Cas d'Ivresse Comme Causes d'Accident de la Circulation. Acta Med. Lig. Social, 1:387, 1948.

Tiffin, J. and McCormick, E.J. Industr. Psychol. 5th Edition, Prentice-Hall, Inc., Englewood Cliffs, N. J., 1965.

Tobin, J.R., et al. Primary Myocardial Disease and Alcoholism: The Clinical Manifestations and Course of the Disease in a Selected Population of Patients Observed for Three or More Years. Circulation, 35:754-764, 1967.

Uecker, A.E. Kish, G.B. and Ball, M.E. Differentiation of Alcoholism from Psychopathology by Means of Two MMPI Scales. J. Clin. Psychol., 25:287-289, 1969.

U. S. Civil Service Commission. Employment Interviewing. Personnel Methods Series No. 5, Washington, D. C., Superintendent of Documents, 1955.

Vamosi, M. Experiences with Non-Alcoholic Road Traffic in Czechoslovakia. In: Proceedings 2nd Int. Conf. Alc. Rd. Traffic, Sept. 1953, Toronto. Garden City Press Cooperative, Toronto, 1955.

Wagner, R. The Employment Interview: A Critical Summary. Personnel Psychol., 2:17-46, 1949.

Waller, J. Identification of Problem Drinking Among Drunken Drivers. JAMA, 200:114-120, 1967.

Wanberg, K.W. and Horn, J.L. Alcoholism Symptom Patterns of Men and Women: A Comparative Study. Quart. J. Stud. Alc., 31: 40-61, March 1970.

Wanberg, K.W. and Knapp, J. Differences in Drinking Symptoms and Behavior of Men and Women Alcoholics. Brit. J. Addict., 64:347-55, 1970.

Wanberg, K.W. Prevalence of Symptoms Found Among Excessive Drinkers. Int. J. Addict., 4:169-185, 1969.

Webster, E.C. Factors Pertaining to Decision Making in the Personnel Interview. Final Report, Canadian Defense Research Board Grant 9435-53, 1962.

Wechsler, H. Kasey, E.H. Thum, D. and Demone, H.W. Alcohol Level and Home Accidents. Pub. Health Rep., 84:1043-50, 1969.

Weiss, D.J. and Dawis, R.V. An Objective Validation of Factual Interview Data. J. Appl. Psychol., 40:381-385, 1960.

Weiss, D.J. Dawis, R.B. England, G.W. and Lofquist, L.H. Validity of Work Histories Obtained by Interview. Minnesota Studies in Vocational Rehabilitation, No. 12, Univ. of Minnesota, Minneapolis, 1961.

Wenners, A.C. Responding to the Emotional Needs of the Alcoholic. Soc. Casework, 38:189-193, 1957.

Wentworth, P. How To Improve Employment Interviews. Personnel J., 32:46-49, 1953.

Williams, A.F. Self-Concepts of College Problem Drinkers: II. Heilbrun Need Scales. Quart. J. Stud. Alc., 28:267-276, 1967.

Williams, A.F. Validation of a College Problem-Drinking Scale. J. Project. Tech., 31:33-40, 1967.

Yonge, K.A. The Value of the Interview: An Orientation and a Pilot Study. J. Appl. Psychol., 40:25-31, 1956.

Zucker, R.A. Sex-Role Identity Patterns and Drinking Behavior of Adolescents. Quart. J. Stud. Alc., 29:868-84, 1968.

Zylman, R. and Bacon, S.D. Police Records and Accidents Involving Alcohol. Quart. J. Stud. Alc., Suppl. No. 4, pp. 178-211, 1968.

BIBLIOGRAPHY

Agostoni, A. Vergani, C. Stabilini, R. and Petrella, A. Thyroxine-binding prealbumin in alcoholic cirrhosis. Lancet 1:926-927, 1968.

Alcoholism: diagnosis, treatment. Reprinted from Patient Care & distributed as a service by Ayerst Laboratories, New York, N.Y., 10017.

Allen, I.R. and Dootjes, I. Some Personality Considerations of an Alcoholic Population. Perceptual and Motor Skills 27:707-712, 1968.

Archibald, H.C. Parker, D.E. Smith, M.K. and Tuddenham, R.D. Who Seeks Treatment. J. Psychol. 72:151-7, 1969.

Aschan, G. Habituation to Repeated Rotary Stimuli (Cupulometry) and the Effect of Antinausea Drugs and Alcohol on the Results. Acta oto-laryng., 64:95-106, 1967.

Augustine, J.R. Laboratory Studies in Acute Alcoholics. Canad. Med. Ass. J. 96:1367-1370, 1967.

Bailey, M.B. Epidemiologic Studies and Control Programs in Alcoholism. VI. Some Issues in Epidemiologic Surveys of Alcoholism. Amer. J. Publ. Hlth. 57:987-991, 1967.

Bailey, M.D. and Stewart, J. Normal Drinking by Persons Reporting Previous Problem Drinking. Quart. J. Stud. Alc. 28:305-315, 1967.

Ball, G.V. and Morgan, J.M. Chronic Lead Ingestion and Gout. Sth. Med. J. 61:21-24, 1968.

Barry, Jr. Anderson, H.E. Jr. and Thomason, O.B. MMPI Characteristics of Alcoholic Males Who are Well and Poorly Adjusted in Marriage. J. Clin. Psychol. 23:355-60,1967.

Beard, J.D. and Knott, D.H. Fluid and Electrolyte Balance During Acute Withdrawal in Chronic Alcoholic Patients. J. Amer. Med. Ass. 204:135-139, 1968.

Becker, K.L. Matthews, M.J. Winnacker, J. and Higgins, G.A., Jr. Sequential Histological Study of the Regression of Gynecomastia in a Patient with Alcoholic Liver Disease. Amer. J. Med. Sci. 254:685-691, 1967.

Bell, A.H., et al. Measuring Adjustment in Patients Disabled with Alcoholism. Quart. J. Stud. Alc. 30:634-9, 1969.

Bennett, R.M. Buss, A.H. and Carpenter, J.A. Alcohol and Human Physical Aggression. Quart. J. Stud. Alc. 30:870-876, 1969.

Borg, E. and Moller, A.R. Effect of Ethyl Alcohol and Pentobarbital Sodium on the Acoustic Middle Ear Reflex in Man. Acta Oto-Laryng. 64:415-426, 1967.

Brenner, Berthold. Alcoholism & Fatal Accidents. Quart. J. Stud. Alc. 28:517-528, 1967.

Brenner, Berthold and Selzer, Melvin L. Risk of Causing a Fatal Accident Associated with Alcoholism, Psychopathology, and stress. Further Analysis of Previous Data. Behavioral Science 14:490-495, 1969.

Browne-Mayers An, Seelye, E.E. Alcoholism. Progr. Neurol. Psychiat. 24:440-51, 1969.

Burdick, J.A. A Field-Independent Alcoholic Population. J. Psychol. 73:163-6, 1969.

Campbell, H.E. Studies of Driving and Drinking. Quart. J. Stud. Alc. 30:457-8, 1969.

Camps, F.E. and Dobb, B.E. Increase in the Incidence of Non-secretors of ABII Blood Group Substances Among Alcoholic Patients. Brit. Med. J. 1:30-31, 1967.

Carneiro-DeMoura, M. Pinto-Correia, J. and Maderia, F. Clinical Alcohol Hypoglycemia. Ann. Inter. Med. 66:893-905, 1967.

Carpenter, J.A. Effects of Alcohol on Some Psychological Processes. A Critical Review with Special Reference to Automobile Driving Skill. Quart. J. of Stud. on Alc. 23:274-314, 1962.

Carson, J.E. Diagnostic Treatment Trends. Maryland Med. J. 18:89, 1969.

Chafetz, Morris E. Alcoholism Prevention and Reality. Quart. J. Stud. on Alc. 28:345-348, 1967.

Chey, W.Y. Kusakcioglu, O. Dinoso, V. and Lorber, S.H. Gastric Secretion in Patients with Chronic Pancreatitis and in Chronic Alcoholics. Arch. Intern. Med. 21:399-403, 1968.

Chomet, B. and Gach, B.M. Lobar Pneumonia and Alcoholism. An Analysis of Thirty-seven Cases. Amer. J. Med. Sci. 253:300-304, 1967.

Churkin, E.A. Elektroforeticheskoye Issledovaniye Belkov Syvorotki Krovi Pri Alkogolizme. (Electrophoretic Study of Blood Serum Proteins in Alcoholism) Zh. Nevropat. 67:280-284, 1967.

Cohen, G. and Collins, M. Alkaloids from Catecholamines in Adrenal Tissue: Possible Role in Alcoholism. Science 167:1749-1751, 1970.

Cosper, R. and Mozersky, K. Social Correlates of Drinking and Driving. Quart. J. Stud. Alc., Supple. No. 4, pp. 58-117, 1968.

Cox, W.D. and Gillesby, W.J. Longitudinal Pancreaticojejunostomy in Alcoholic Pancreatitis. Arch. Surg., 94:469-475, 1967.

Craddick, R.A. and Leipold, W.D. Note on the Height of Draw-A-Person Figures by Male Alcoholics. J. Project Techn. 32:486, 1968.

Crancer, A. Involvement of the Problem Driver in Fatal Motor Vehicle Accidents - 1966 Data. Traffic Quarterly, 21:601-610, 1967.

Crouse, J.R. Gerson, C.D. DeCarli, L.M. and Lieber, C.S. Role of Acetate in the Reduction of Plasma Free Fatty Acids Produced by Ethanol in Man. J. Lipid Res. 9:509-512, 1968.

Crutcher, J.C. Lead Intoxication and Alcoholism: A Diagnostic Dilemma. J. Med. Ass. Ga. 56:1-4, 1967.

Cutter, Henry S. Alcohol, Drinking Patterns, and the Psychological Probability of Success. Behavioral Sci., 14:19-27, 1969.

Dajani, R.M. and Kouyoumajian, C. Alcohol Dehydrogenase: In Vitro Studies of its Relationship to Hepatic Lipid Syntehesis in the Rat. Quart. J. Stud. Alc. 30:295-311, 1969.

Davis, V.E. Brown, H. Huff, J.A. and Gashaw, J.L. The Alteration of Serotonin Metabolism to 5-Hydroxytryptophol by Ethanol Ingestion in Man. J. Lab. Clin. Med. 69:132-140, 1967.

Davis, V.E. Brown, H. Huff, J.A. and Cashaw, J.L. Ethanol-Induced Alterations of Norepinephrine Metabolism in Man. J. Lab. Clin. Med. 69:787-799, 1967.

Davis, V.E. Cashaw, J.L. Huff, J.A. Brown, H. and Nicholas, N.L. Alteration of Endogenous Catecholamine Metabolism by Ethanol Ingestion. Proc. Soc. Exp. Biol. 125:1140-1143, 1967.

Davis, V.E. Walsh, M.J. Alcohol, Amines, and Alkaloids: A Possible Biochemical Basis for Alcohol Addiction. Science (in press).

Derrick, E.H. A Survey of the Mortality Caused by Alcohol. Med. J. Aust. 2:914-9, 1967.

Dimberg, R. Hed, R. Kallner, G. and Nygren, A. Liver-muscle Enzyme Activities in the Serum of Alcoholics on a Diet Poor in Carbohydrates. Acta. Med. Scand. 181:227-232, 1967.

Dittmann, J. Mayer, J.B. and Huber, P. Zum Stoffwechsel des Bacterium bifidum (Lactobacillus bifidus). X. Bildung von Athanol. (On the Metabolism of Bacterium bifidum (Lactobacillus bifidus). X. Formation of Ethanol)) Z. Kinderheilk, 99:115-118, 1967.

Doleys, Ernest J., et al. Varying Amounts of Alcohol and Personality Inventory Performance. J. of Clin. Psychol. 23:484-486, 1967.

Dzyak, V.N. and Borovskii, P.A. Osobennosti belkovo-lipoidnogo obmena i koronarnogo krovoobrashcheniya u lits, stradayushchikh khronicheskim alkogolizmom (The Peculiarities of Albumin-lipid Metabolism and Cornonary Circulation in Persons Suffering from Chronic Alcoholism). Zh. Nevropat. 68:590-592, 1968.

Duritz, G. Truitt, E.B. Jr. Importance of Acetaldehyde in the Action of Ethanol on Brain Norepinephrine and 5-hydroxytryptamine. Biochem. Pharmacol. 15:711-721, 1966.

Edmondson, H.A. Peters, R.L. Frankel, H.H. and Borowsky, S. The Early Stage of Liver Injury in the Alcoholic. Medicine. 46:119-129, 1967.

Edwards, J.A. and Price, J. Metronidazole and Human Alcohol Dehydrogenase. Nature. 214:190-191, 1967.

Emory, M.L. Medical Management of the Effects of Alcohol and Alcoholism. J. Louisiana Med. Soc. 121:279-83, 1969.

Erlander, S.R. Explanation of the Common Relationships of Diabetes Mellitus and Atherosclerosis with Consumption of Carbohydrates, Saturated Fats, Alcohol, and with Smoking. Starke. 19:179-188, 1967.

Feinman, L. and Lieber, C.S. Effect of Ethanol on Plasma Glycerol in Man. Amer. J. Clin. Nutrit. 20:400-403, 1967.

Feldstein, A. Hoagland, H. Freeman, H. and Williamson, O. The Effect of Ethanol Ingestion on Serotonin-C^{14} Metabolism in Man. Life Sci., 6:53-61, 1967.

Fowler, R.D. Jr. and Coyle, F.A. Jr. A Comparison of Two MMPI Actuarial Systems Used in Classifying an Alcoholic Out-Patient Population. J. of Clin. Psychol., 24:434-435, 1968.

Friedman, M.M. An Eclectic Technique to Interview Alcoholics. J. Amer. Osteopath. Ass. 67:1066-8, 1968.

Fuller, G.B. Lunney, G.H. and Naylor, W.M. Role of Perception in Differentiating Subtypes of Alcoholism. Perceptual and Motor Skills, 23:735-743, 1966.

Gadrat, J., Douste-Blazy, L., Ribet, A., Pascal, J.P. and Frexinos, J. Syndrome de Zieve Associe a une Pancreatite Calcifiante; le role du Pancreas et des Lysolecithines Dans L'anemie. (Zieve's Syndrome Associated with Calcifying Pancreatitis; The role of the Pancreas and Lysolecithins in Anemia). Pr. Med. 75:789-792, 1967.

Gallus, H. Blood to Cerebrospinal Fluid Sugar Index in Chronic Alcoholics (Wakaznik cukrowy krew--plyn mozgowo-rdzeniowy u przewleklych alkoholikow). Przegl. Lek. 23:675-676, 1967.

Gardiner, R.J. and Stewart, H.B. Blood Alcohol and Glucose Changes After Ingestion of Ale, Wine and Spirit. Quart. J. Stud. Alc. 29:313-322, 1968.

Gibbens, T.C. Psychosomatic Aspects of the Recidivist Population. J. Psychosom. Res. 13:253-6, 1969.

Gillespie, J.A. Vasodilator Properties of Alcohol. Brit. Med. J. 2:274-277, 1967.

Goldberg, L. et al. Inhibition of Ethanol Metabolism in Vivo by Administration of Pyrazole. Biochem. Pharmacol. 18:1749-62, 1969.

Goldstein, G., Chotlos, J.W., McCarthy, R.J. and Neuringer, C. Recovery from Gait Instability in Alcoholics. Quart. J. Stud. Alc. 29:38-43, 1968.

Goldstein, Steven G. and Linden, James. D. Multivariate Classification of Alcoholics by Means of the MMPI. J. Abnorm. Psychol. 74:661-669, 1969.

Golightly, Carole and Reinehr, Robert C. 16 PF Profiles of Hospitalized Alcoholic Patients; Replication and Extension. Psychological Reports. 24:543-545, 1969.

Goodwin, D.W., Johnson, J., Mahler, C., Rappaport, A. and Samuel, B. Why People Do Not Drink: A Study of Teetotalers. Comprehensive Psychiatry, 10:209-214, 1969.

Gomberg, E.S. Etiology of Alcoholism. J. Consulting Clin. Psychol. 32:18-20, 1968.

Goss, A. and Morosko, T.E. Alcoholism and Clinical Symptoms. J. Abnorm. Psychol. 74:682-4, 1969.

Haertzeu, C.A. and Panton, J.H. Development of a "Psychopathic" Scale for the Addiction Research Center Inventory (ARCI). Int. J. Addict. 2:115-127, 1967.

Halsted, C.H., Griggs, R.C. and Harris, J.W. The Effect of Alcoholism on the Absorption of Folic Acid (H^3-PGA) Evaluated by Plasma Levels and Urine Excretion. J. Lab. Clin. Med. 69:116-131, 1967.

Hoff, E.C. The Etiology of Alcoholism. Quart. J. Stud. Alc. Suppl. No. 1, 23:57-65, 1962.

Hudolin, V. and Gubarev, N. The Characteristics of the Alpha Rhythm in Chronic Alcoholics. Brit. J. Addict. 62:55-60, 1967.

Hyman, M.M. Accident Vulnerability and Blood Alcohol Concentrations of Drivers by Demographic Characteristics. Quart. J. Stud. Alc. Suppl. No. 4, pp. 34-57, 1968.

Itil, T.M., Holden, J.M.C., Keskiner, A. and Shapiro, D. Central Effects of Metronidazole. Psychiat. Res. Rep. 24:148-165, 1968.

Jackson, J.K. and Kogan, K.L. The Search for Solutions: Help-seeking Patterns of Families of Active and Inactive Alcoholics. Quart. J. Stud. Alc. 24:449-472, 1963.

Jenkins, J.A. and Conolly, J. Adrenocortical Response to Ethanol in Man. Brit. Med. J. 2:804-805, 1968.

Jepson, R.P., Young, J.F. and Zaikos, A. The Natural History of "Acute Pancreatitis". Aust. N.Z. J. Surg. 37:27-31, 1967.

Jessor, R., Carman, R.S. and Grossman, P.H. Expectations of Need Satisfaction and Drinking Patterns of College Students. Quart. J. Stud. Alc. 29:101-116, 1968.

Kastl, A.J. Changes in Ego Functioning Under Alcohol. Quart. J. Stud. Alc. 30:371-383, 1969.

Kater, M.H., Tobon, F. and Iber, F.L. Increased Rate of Tolbutamide Metabolism in Alcoholic Patients. J. Amer. Med. Ass. 207: 363-365, 1969.

Keehn, J.D. Reinforcement of Alcoholism: Schedule Control of Solitary Drinking. Quart. J. Stud. Alc. 31:28-39, 1970.

Kelly, N.L. Alcoholism and Social Experience; An Exploratory Analysis of the Social Histories of 250 Alcoholics. (North Carolina Alcoholism Rehabilitation Program Project, No.3) Raleigh, 1954.

Kershaw, P.W. Blood Thiamine and Nicotinic Acid Levels in Alcoholism and Confusional States. Brit. J. Psychiat. 113:387-393, 1967.

Kish, G.B., Donnenwerth, G.V. The Similes Preference Inventory - The Unsuccessful Search for Construct Validity in a Clinical Setting. J. Clin. Psychol. 25:439-42, 1969.

Knupfer, G. The Epidemiology of Problem Drinking. Amer. J. Pub. Health, 57:973, 1967.

Kristianson, P. A Comparative Study of Two Alcoholic Groups and a Control Group. Brit. J. Med. Psychol. 43:161-75, 1970.

Laessig, R.H. and Waterworth, K.J. Involvement of Alcohol in Fatalities of Wisconsin Drivers. Public Health Reports, 85: 535-549, 1970.

Lieber, C.S. Metabolic Derangement Induced by Alcohol. Ann. Rev. Med. 18:35-54, 1967.

Lieberman, F.L. and Bateman, J.R. Megaloblastic Anemia Possibly Induced by Triamterene in Patients with Alcoholic Cirrhosis; Two Case Reports. Ann. Intern. Med. 68:168-173, 1968.

Lelbach, W.K. Zur leberschadigenden Wirkung verschiedener Alkoholika. (On the Liver-damaging Effect of Various Alcoholic Beverages.) Dtsch. Med. Wschr. 92:233-238, 1967.

Lester, D., Keolosky, W.Z., Felzenberg, F. Effect of Pyrazoles and Other Compounds on Alcohol Metabolism. Quart. J. Stud. Alc. 29:449-454, 1968.

Levendel, L., Mezei, A., Nemes, L. and Mezei-Erdely, E. Some Data Concerning the Personality Structure of Alcoholic Patients. Brit. J. Addict. 62:317-30, 1967.

Lennon, B.E., Rekosh, J.H., Patch, V.D. and Howe, L.P. Self-reports of Drunkenness Arrests. Assessing Drinking Problems Among Men Hospitalized for Tuberculosis. Quart. J. Stud. Alc. 31:90-6, 1970.

Lisansky, E.S. Alcoholism in Women: Social and Psychological Concomitants. I. Social History Data. Quart. J. Stud. Alc. 8:588-623, 1957.

Lovald, K. and Neuwirth, G. Exposed and Shielded Drinking. Drinking as Role Behavior and Some Consequences for Social Control and Self-Concept. Arch. Gen. Psychiat. 19:95-103, 1968.

Lundvall, O., Weinfeld, A. and Lunden, P. Iron Stores in Alcohol Abusers. I. Liver Iron. Acta. Med. Scand. 185:259-69, 1969.

Lundvall, O., Weinfeld, A. and Lunden, P. Iron Stores in Alcohol Abusers. II. As Measured with the Desferrioxamine Test. Acta. Med. Scand. 185:271-7, 1969.

MacAndrew, C. Self-reports of Male Alcoholics; A Dimensional Analysis of Certain Differences from Nonalcoholic Male Psychiatric Out-Patients. Quart. J. Stud. Alc. 28:43-51, 1967.

McCarthy, K., Lovenberg, W. and Sjoerdsma, A. The Mechanism of Inhibition of Horse Liver Alcohol Dehydrogenase by Thyroxine and Related Compounds. J. Biol. Chem. 243:2754-2760, 1968.

McGonnell, P.C. and Beach, H.D. The Effects of Ethanol on the Acquisition of a Conditioned GSR. Quart. J. Stud. Alc. 29:845-855, 1968.

Masserman, J.H. and Wigdahl, L.C. The Neuroses. Progr. Neurol. Psychiat. 23:482-95, 1968.

Mendelson, J.H., Stein, S., Mello, N.K. Effects of Experimentally Induced Intoxication of Metabolism of Ethanol-1-C^{14} in Alcoholic Subjects. Metabolism. 14:1255-1266, 1965.

Menon, I.S. Effect of Alcohol on Blood Fibrinolytic Activity. Lab. Practice. 17:44-45, 1968.

Metz, R. and Berger, S. Islet Priming Effect of Ethanol. Diabetes. 17:298, 1968.

Miller, B.A., Pokorny, A.D., Walles, J. and Cleveland, S.E. Biased Sampling in Alcoholism Treatment Research. Quart. J. Stud. Alc. 31:97-107, 1970.

Miller, B.A., Bentinck, C.A., Pokorny, A.D. Factor Analysis of Psychiatric Symptoms-Alcoholics Compared with Schizophrenics. Psychol. Rep. 21:942-4, 1967.

Milton, R.B. and Lee, R. A Severity of Drinking Scale in Chronic Alcoholics. Alc. Clinic. Royal Brisbane Hosp. and Wacol. Rehab. Clinic, Queensland.

Mulford, H.A. Iowa's Drinking Driver, 1961; with a Method for Identifying Drinking Drivers in a Survey Sample. Social Probl. 12:196-211, 1964.

Mulford, H.A. and Miller, D.E. Drinking in Iowa. Quart. J. Stud. Alc. 21:26-39, 1960.

Mulford, H.A. and Miller, D.E. The Prevalence and Extent of Drinking in Iowa, 1961; a Replication and an Evaluation of Methods. Quart. J. Stud. Alc. 24:39-53, 1963.

Murphree, H.B., Greenberg, L.A. and Carroll, R.B. Neuropharmacological Effects of Substances Other than Ethanol in Alcoholic Beverages. Fed. Proc. 26:1468-1473, 1967.

Nocks, J.J., Brandley, D.L. Self-Esteem in an Alcoholic Population. Dis. Nerv. Systm. 30:611-7, 1969.

Norris, J.L. Research in Alcoholism--a Report. Arch. Environ. Health 19:257-60, 1969.

Nygren, A. Serum Creatine Phosphokinase in Chronic Alcoholism. Acta. Med. Scand. 182:383-387, 1967.

Opaleva-Stegantseva, V.A. O roli alkogolya v nastuplenii skoropostizhnoi smerti ot ostroi koronarnoi nedostatochnosti i infarkta miokarda pri ateroskleroze i gipertonicheskoi bolezni (On the Role of Alcohol in the Onset of Sudden Death Due to Acute Coronary Insufficiency and Myocardial Infarct in Atherosclerosis and Hypertension) Kardiologiya, Mosk. 8:145-147, 1968.

Ott, B. Nervendrucklahmungen "ohne" Trauma (Paralyses Due to Nerve Pressure "Without" Trauma) Landarzt 42:1632-1635, 1966.

Pfeffer, A.Z. Alcoholism. Modern Monographs in Industrial Medicine. 1958.

Plaut, A. Transference Phenomena in Alcoholism. Brit. J. Med. Psychol. 42:313-22, 1969.

Pokorny, A.D., Miller, B.A. and Cleveland, S.E. Response to Treatment of Alcoholism. A Follow-up Study. Quart. J. Stud. Alc. 29:364-81, 1968.

Popper, H., Davidson, C.S., Leevy, C.M., et al. The Social Impact of Liver Disease. New Eng. J. Med. 281:1455-8, 1969.

Predescu, V., Roman, I., Cristian, C., Vianu, I. and Terzi, A. Electro-clinical Correlations in Chronic Alcoholism With Psychial Disturbances. Electroenceph. Clin. Neurophysiol. 22:576, 1967.

Primary Myocardial Disease and Alcoholism. Nutr. Rev. 25:278-280, 1967.

Pryer, M.W. et al. Further Evaluation of the EPPS With Hospitalized Alcoholics. J. Clin. Psychol. 26:205, 1970.

Rakklainen, V. and Turunen, S. From Unrestrained to Moderate Drinking. Acta. Psychiat. Scand. 45:47-52, 1969.

Robins, L.N., Murphy, G.E. and Breckenridge, M.B. Drinking Behavior of Young Urban Negro Men. Quart. J. Stud. Alc. 29:657-684, 1968.

Rohan, W.P., Tatro, R.L. and Rotman, S.R. MMPI Changes in Alcoholics During Hospitalization. Quart. J. Stud. Alc. 30:389-400, 1969.

Rosenberg, C.M. Young Alcoholics. Brit. J. Psychiat. 115:181-8, 1969.

Rubin, E. and Lieber, C.S. Alcohol-Induced Hepatic Injury in Nonalcoholic Volunteers. New Engl. J. Med. 278:869-876, 1968.

Rubin, E. and Lieber, C.S. Early Fine Structural Changes in the Human Liver Induced by Alcohol. Gastroenterology. 52:1-13, 1967.

Sands, P.M., Hanson, P.G. and Sheldon, R.B. Recurring Themes in Group Psychotherapy with Alcoholics. Psychiat. Quart. 41:474-82, 1967.

Sanua, V.D. Religion, Mental Health, and Personality - A Review of Empirical Studies. Amer. J. Psychiat. 125:1203-13, 1969.

Schneider, E.W. and Carpenter, J.A. The Influence of Ethanol on Auditory Signal Detection. Quart. J. Stud. Alc. 30:357-370, 1969.

Schuckit, M., Pitts, F.N., Jr., Reich, T., King, L.J. and Winokur, G. Alcoholism, I. Two Types of Alcoholism in Women. Arch. gen. Psychiat. 20:301-306, 1969.

Shaw, D.M., Camps, F.E., Robinson, A.E., Short, R. and White, S. Electrolyte Content of the Brain in Alcoholism. Brit. J. Psychiat. 116:185-93, 1970.

Shelton, J., Hollister, L.E. and Gocka, E.F. The Drinking Behavior Interview. (An Attempt to Quantify Alcoholic Impairment). Dis. Nerv. Syst. 30:464-7, 1969.

Siegenthaler, W. and Filippini, L. Zur Diagnostik des Zieve-Syndroms. (The Diagnosis of Zieve's Syndrome). Dtsch. Med. Wschr. 92:977-978, 1967.

Shimojyo, S., Scheinberg, P. and Reinmuth, O. Cerebral Blood Flow and Metabolism in the Wernicke-Korsakoff Syndrome. J. Clin. Invest. 46:849-854, 1967.

Smark, G. and Schmidth, W. Physiological Impairment and Personality Factors in Traffic Accidents of Alcoholics. Quart. J. Stud. Alc. 30:440-445, 1969.

Smuckler, E.A. The Ultrastructure of Human Alcoholic Hyalin. Amer. J. Clin. Path. 49:790-797, 1968.

Spaventi, S., Hudolin, V., Rudar, M., Gabelic, I. and Metzger, G. Damage to the Liver of Alcoholics in Gamma-scintigraphic Pictures. Brit. J. Addict. 62:61-69, 1967.

Stokes, P.E. and Lasley, B. Further Studies on Blood Alcohol Kinetics in Man as Affected by Thyroid Hormones, Insulin and D-glucose. In: Maickel, R.P. ed. Biochemical Factors in Alcoholism; pp. 101-114, New York; Pergamon; 1967.

Strasser, H., Marki, H.H., Whurmann, F., Niggli, S. and Wick, A. Korrelationen zwischen Ekg. - Befunden und Leberschddigung bei chronischen Alkoholkranken (Correlations Between ECG Findings and Liver Damage in Chronic Alcoholics). Schweiz. Med. Wschr. 97:46-48, 1967.

Tamerin, J.S., Weiner, S., Mendelson, J.H. Alcoholics' Expectancies and Recall of Experiences During Intoxication. Amer. J. Psychiat. 126:1697-704, 1970.

Tamerin, J.S. and Mendelson, J.H. The Psychodynamics of Chronic Inebriation-Observations of Alcoholics During the Process of Drinking in an Experimental Group Setting. Amer. J. Psychiat. 125:886-99, 1969.

Tygstrup, N., Winkler, K., Lundquist, F. The Mechanism of the Fructose Effect on the Ethanol Metabolism of the Human Liver. J. Clin. Invest. 44:817-830, 1965.

Ugarte, G., Pino, M.E. and Insunza, I. Hepatic Alcohol Dehydrogenase in Alcoholic Addicts with and Without Hepatic Damage. Amer. J. Dig. Dis. 12:589-592, 1967.

Vanderpool, J.A. Alcoholism and the Self-Concept. Quart. J. Stud. Alc. 30:59-77, 1969.

Vel'shikayev, R. Kh. K voprosu o dinamike uglevodnogo obmena pri alkogol'nom abstinentnom sindrome. (On the Dynamics of Carbohydrate Metabolism in the Alcohol Abstinence Syndrome). Zh. Nevropat. 67:262-268, 1967.

Wahl, C.W. Some Antecedent Factors in the Family Histories of 109 Alcoholics. Quart. J. Stud. Alc. 17:643-654, 1956.

Waller, J.A. and Turkel, H.W. Alcoholism & Traffic Deaths. New Eng. J. Med. 275:532-536, 1966.

Waller, J.A. Patterns of Traffic Accidents and Violations Related to Drinking and to Some Medical Conditions. Quart. J. Stud. Alc. Suppl. 4-118-37, May 1968.

Tomsovic, M. A Follow-up Study of Discharged Alcoholics. Hosp. Community Psychiat. 21:94-7, 1970.

Walton, H.J. Personality as a Determinant of the Form of Alcoholism. Brt. J. Psychiat. 114:761-6, 1968.

Warembourg, H., Biserte, G., Bertrand, M., Jaillard, J. and Sezille, G. Les acides gras du serum dans diverses affections pathologiques; a propos de 156 observations (Serum Fatty Acids in Various Pathological Conditions; (Concerning 156 Observations). Pr. Med. 75:523-526, 1967.

Wartburg, J.P. von and Schurch, P.M. Atypical Human Liver Alcohol Dehydrogenase. Ann. N.Y. Acad. Sci. 151:936-946, 1968.

Wasiljew, E.A. and Kimbarowskij, J.A. O przydatnosci barwej reakcji osadu moczu wg Kimbarowskiego (BROMK) dla rozpoznawania spozycia alkoholu (On the Usefulness of the Color Reaction of Urinary Sediment According to Kimbarowskij (BROMK) for Detection of Alcohol Ingestion). Polsk. Tyg. lek. 22:790-792, 1967.

Witte, M.H., Cole, W.R., Burton, D.F., Alvarez, L. and Dumont, A.E. Thoracic duct cannulation and differential diagnosis of obstructive jaundice. J. Amer. Med. Ass. 204:366-370, 1968.

Woodruff, R.A. Jr., Clayton, P.J., Guze, S.B. Hysteria - An Evaluation of Specific Diagnostic Criteria by the Study of Randomly Selected Psychiatric Clinic Patients. Brit. J. Psychiat. 115:1243-8, 1969.

Zinneman, H.H., Seal, U.S. and Doe, R.P. Plasma and Urinary Amino Acids in Laennec's Cirrhosis. Amer. J. Dig. Dis. 14:118-126, 1969.

Zylman, R. Accidents, Alcohol and Single-Cause Explanations; Lessons from the Grand Rapids Study. Quart. J. Stud. Alc. Suppl. No. 4, pp. 212-233, 1968.