AN ABSTRACT OF THE THESIS OF

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Title: A Comparison of the MAST, MAC, and ASI as Diganostic Tools in the Detection of Alcohol Abuse

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Past studies have attempted to determine the effectiveness of the Michigan Alcoholism Screening Test (MAST), the MacAndrew Alcoholism Scale (MAC), and the Addiction Severity Index (ASI) in detecting the severity of alcohol abuse. These studies have resulted in conflicting opinions of these instruments. However, no researchers have compared the effectiveness of these three tests.

The purpose of this study was to determine the effectiveness of the MAST, MAC, and ASI relative to each other when screening for alcohol abuse. Subjects consisted of DUI offenders who had been referred to a mental health center for an evaluation of the severity of their drinking problem. There were 100 subjects in this study. The total subject pool was analyzed. Then males and females were analyzed separately. To determine if these three instruments were more effective when applied to individuals with a severe drinking problem, the subjects with very high

blood alcohol contents (BACs) of .20 or more were then analyzed.

The results of a chi square analysis demonstrated that neither the MAST nor the MAC were useful instruments when screening for alcohol abuse. The ASI was not effective when females only were tested or when the total subject pool was analyzed. However, results did indicate that the ASI was effective when used on males only and when used on subjects with very high BACs (.20>).

These results indicate that in most cases, these three instruments do not correctly identify those individuals who are abusing alcohol. Extreme caution should be used when using the MAST, MAC, or ASI for the detection of alcohol abuse.

A COMPARISON OF THE MAST, MAC, AND ASI AS DIAGNOSTIC TOOLS IN THE DETECTION OF ALCOHOL ABUSE

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TABLE OF CONTENTS

CHAPTER 1

LITERATURE REVIEW

Introduction

Alcohol abuse is a serious problem which is extremely widespread in today's society. Individuals suffering from this disorder commonly deny their condition to themselves and to others. Therefore, it is very important to accurately diagnose alcohol abusers so that effective treatment can be implemented.

There has been increasing dissatisfaction with subjective definitions of alcohol abuse. Combined with the growing numbers of alcohol abusing individuals in this country, this dissatisfaction has resulted in attempts to use psychometric measures to provide a more objective criterion of alcohol abuse for treatment purposes (MacAndrew, 1979).

The need for more discriminating assessment techniques combined with many attempts to avoid the detection of alcohol-related problems suggests the need for the use of more than one type of screening instrument when one is trying to diagnose the presence of alcoholism or alcohol abuse. Among the more widely used screening devices for detecting alcohol abusing individuals are the Michigan Alcoholism Screening Test (MAST), the MacAndrew Alcoholism Scale (MAC), and the Addiction Severity Index (ASI).

Statement of Purpose

To provide statistical evidence indicating the usefulness of the MAST, MAC, and the ASI as valid diagnostic tools for the identification of alcohol abusing individuals. To determine the usefulness of these three instruments when screening for alcohol abuse.

Statement of Significance

Since many alcohol abusers, including those who are DUI offenders attempt to avoid detection, it is important to accurately identify these individuals. The increasing social and economic costs of untreated people with alcohol problems and ineffective therapeutic interventions accentuate the need for the best possible match of the alcohol abuser to treatment strategies (Tulevski, 1989).

If the MAST, MAC, or ASI is found to be effective in detecting the presence of alcohol abuse among individuals who usually attempt to hide their drinking problems, the accuracy of the diagnosis of alcohol abusers and their recommended treatment could be improved. Many people would benefit from a more accurate method of detecting the presence of alcohol abuse since this disorder poses a significant threat to society.

Definitions

There is some disagreement as to the exact definition of alcohol abuse. Alcohol abusers are often diagnosed by the use of the criteria set forth in the Diagnostic and

Statistical Manual (American Psychiatric Association, 1987). This manual lists the diagnostic criteria for psychoactive substance abuse as:

A. A maladaptive pattern of psychoactive substance use indicated by at least one of the following:
   (1) continued use despite knowledge of having a persistent or recurrent social, occupational, psychological, or physical problem that is caused or exacerbated by the use of the psychoactive substance
   (2) recurrent use in situations in which use is physically hazardous (e.g., drives while intoxicated)

B. Some symptoms of the disturbance have persisted for at least one month, or have occurred repeatedly over a longer period of time.

C. Never met the criteria for Psychoactive Substance Dependence for this substance (p. 109).

Blood alcohol content (BAC) is the number of grams in each milliliter of blood. The level of alcohol in the blood gives a reasonable estimation of the amount of alcohol in the brain. Heavy drinkers build up a tolerance to alcohol and require a higher BAC before their performance is impaired than do light drinkers. Thus, an individual who has a high BAC but is still functioning, probably has a

drinking problem. Ray and Ksir (1990) found a BAC of .15 results in large, consistent increases in reaction time and some motor disturbance. For the purpose of this study, subjects with a BAC of .15 or more will be considered to be alcohol abusers.

Literature Review

The Michigan Alcoholism Screening Test (MAST) was developed by Selzer (1971) to assist in detecting alcohol abuse. It is a 25-item self-report questionnaire that takes approximately five minutes to complete. Scores of five and above are usually considered indicative of alcohol abuse. The test items detect symptoms of alcohol abuse and certain facets of interpersonal and social behavior that are very similar to the DSM III-R (1987) criteria for alcohol abuse (Blankfield & Maritz, 1990).

The MAST has been found to be useful in helping clinicians and counselors identify the alcohol abusing person. Blankfield and Maritz (1990) reported the administration of the MAST as a screening device appeared to be more accurate than clinical judgement in detecting unsuspected alcohol abusers. In addition, Moore (1971) concluded a simple screening test like the MAST provides a more sensitive measure of alcohol abuse than clinician's or physician's diagnoses.

Many researchers support the use of a questionnaire such as the MAST when screening for alcohol abuse. Ross,

Gavin, and Skinner (1990) found the MAST to be a useful instrument in detecting the presence of alcohol abuse in patients presenting for treatment of various substance abuse problems and said it has become increasingly clear that if an evaluator asks the right questions, the patient will respond in a way which indicates abuse of alcohol or other substances. The consensus is that self-report methods are very successful in detecting alcohol abuse. In addition to being a sensitive screening tool, the MAST has the added advantage of being cost-effective, as it is easy to administer, simple to score, and is valid and reliable (Dobkin, Dongier, Cooper, & Hill, 1991).

Factors that are not directly related to alcohol consumption have been found to affect MAST scores. For example, Skinner and Shew (1982) found that unfavorable consequences of drinking correlated more strongly with the reported amounts of alcohol consumed and elevated MAST scores than did the number of years spent drinking. In another study, perceived family conflict was found to be related to elevated MAST scores (Pardeck, 1991). Ross, Gavin, and Skinner (1990) stated the MAST items tap not only the presence or absence of alcohol abuse, but various problems associated with alcohol use, including its medical, interpersonal, and legal consequences.

Denial of an existing drinking problem would be expected to reduce the reliability of a self-report

questionnaire such as the MAST. However, Blankfield and Maritz (1990) reported that vague MAST responses from a few subjects with denial did not obscure the average trend in the majority of the subjects. "Findings support the utility of the MAST with individuals who deny alcohol-related problems" (p.486). Selzer (1971) concurred that the effect of denial on MAST responses is negligible.

In contrast to these findings, Dobkin et al. (1991) reported that the MAST is vulnerable to positive dissimulation. "Positive dissimulation may be described as a test-taking set in which examinees attempt to minimize those aspects of their disposition or behavior that they consider problematic and/or accentuate those parts that they think are desirable" (p. 500). When an individual is denying an existing problem, the occurrence of positive dissimulation could be expected. Alcohol abusers readily manipulated their MAST scores which affected their classification as alcoholic or nonalcoholic (Dobkin et al., 1991).

Kaplan, Kanes, Pokorney, and Lively (1974) asked if individuals who were aware they had an alcohol problem would score differently on the MAST than those who did not know or denied to themselves that they had a drinking problem. Alcohol abusers may be able to identify symptoms which classify them as alcohol dependent but may not be able to specify the nature of the problem (Dobkin et al., 1991).

Kaplan et al. (1974) studied 132 subjects from a Veterans Administration Hospital, half of which had voluntarily entered the alcoholism treatment ward (self-identified alcoholics) and half from the psychiatric ward who had been diagnosed alcoholic but were unaware of their diagnosis (non self-identified alcoholics). The comparison between MAST scores achieved by those on the psychiatric ward and those achieved by the subjects on the alcoholism treatment ward revealed that the latter subjects were significantly more likely to achieve higher scores on the MAST. This indicated that individuals who are aware they have a problem with alcohol may receive higher MAST scores than those who are unaware of any existing alcohol related problems.

Underreporting of alcohol use has been a serious problem with self-report questionnaires. Ernhart, Morrow-Tlucak, Sokol, and Martier (1988) stated that the problem with validity of self-reports of alcohol use has long been recognized. They found "evidence of a greater degree of underreporting than had been anticipated" (p. 510). Subjects who scored higher on the MAST reported consuming less alcohol than those who scored lower on the MAST. Those who do report high amounts of alcohol consumption may be less likely to be underreporting the actual amount of alcohol that they consumed than those individuals who report drinking smaller amounts of alcohol (Polich, 1982).

Misrepresentation and score manipulation is a serious

problem when screening for alcohol abuse. Because there is a widespread use of alcoholism inventories in court-referred and self-referred cases and test results can influence serious outcome consequences such as inpatient treatment or incarceration, it is extremely important to know what extent individuals can manipulate their scores (Sinnett, Benton, & Whitfill, 1991). Otto and Hall (1988) found that alcohol abusers readily manipulated their MAST scores and avoided detection whenever they were motivated to do so. Direct alcohol inventories usually have questions that inquire specifically about drinking and related behaviors. This type of inventory has what is called face validity. What kind of information that the test is asking is obvious to the test taker. Because of their obvious nature, assessment inventories with high face validity (such as the MAST) have been highly criticized as being very susceptible to falsification and score manipulation and therefore, being of limited utility. Although the utility of the MAST was very good when alcohol abusers answered honestly, its ability to identify the presence of alcohol abuse suffered greatly when these individuals were motivated to avoid detection (Otto & Hall, 1988).

Not only have problems been encountered when alcohol abusing individuals who are administered the MAST are not identified (false negatives), but the MAST often identifies people with no existing drinking problem as alcohol abusive

(false positives). Ross et al. (1990) evaluated the utility of the MAST in screening for alcohol abuse disorders in a population who had entered a substance abuse treatment clinic. They found that "the optimum cutoff score is 13 for the MAST, much higher than the threshold score of five recommended by Selzer (1971)" (p. 511). An even higher score of 18 was recommended as the cutoff if the patients were to meet all of the DSM-III criteria for alcohol dependence within the past month (Ross et al, 1990). Svikis, McCaul, Turkkan, and Bigelow (1991) found that ambiguity in the wording of certain MAST items can lead to false positive responses and that subjects from alcoholic families might be particularly likely to provide false positive responses because certain items fail to distinguish between alcohol abuse symptoms in subjects versus other family members, or fail to provide objective norms for assessing excessive drinking.

Many questions have been raised as to whether MAST scores are affected by gender or age. Blankfield and Maritz (1990) administerd the MAST to 233 females and 285 males who were diagnosed as alcohol dependent. These subjects were classified into four age categories which were 25-34, 35-44, 45-54, 55 and above. Results showed that males had higher MAST scores than did females, but the average score was the highest in the 25-34 year old age group and decreased with increased age. The conclusion was that age and gender

significantly affect MAST scores. In addition, Ernhart et al. (1988) found that women usually underreport amount and frequency of alcohol consumption much more than men. They assumed that this was due to the gender-related stigma regarding drinking. Underreporting was also found to occur more frequently among females who had histories of alcohol abuse.

There have been many arguments for and against the use of the MAST. Blankfield and Maritz (1990) stated that the utility of the MAST, DSM III-R, and other diagnostic instruments have long been questioned, and that lack of specificity is present in any instrument that is used to measure a disorder in which symptoms may overlap with other existing conditions. "All diagnostic techniques have limitations and detecting the hidden alcoholic lies at the interface of all diagnostic modalities" (p. 486).

The MacAndrew Alcoholism Scale (MAC) was developed by MacAndrew (1965) in an attempt to differentiate male outpatient alcoholics from nonalcoholic male psychiatric outpatients. The MAC was developed from the Minnesota Multiphasic Personality Inventory (MMPI). Forty-nine items were ultimately selected from the MMPI which were found to correlate significantly with the way alcoholic individuals responded to them. Allen, Faden, Rawlings, and Miller (1990) stated, "with the possible exception of the Michigan Alcoholism Screening Test, the MacAndrew Scale has received

more attention than any other biochemical or pencil-and-paper alcoholism-screening measure" (p. 697). The MAC Scale is probably the most widely used and thoroughly researched of the many alcoholism scales derived from the MMPI (Colligan & Offord, 1990). A high score on the MAC is interpreted as indicative of excessive drinking and a low score, of nonexcessive or nonexistent drinking. MacAndrew (1965) recommended a cutoff score of 24 be used in identifying alcohol abusers. The items are true/false and some items which are answered true are given one point while other items which are answered true are given one point.Those who score 24 or above are considered to have a problem with alcohol.

Some research has revealed that the MAC Scale is effective in identifying alcohol abusing individuals. Apfeldorf and Hunkey (1981) said the MAC Scale has yielded the most promising findings of all the MMPI alcoholism scales. The MAC has low face validity since none of the items relate specifically to drinking. Searles, Alterman, and Purtill (1990) stated since none of the MAC items ask directly about alcohol use or drinking-related problems, the MAC may have an advantage over the MAST of being less subject to denial or misrepresentation.

The MAC has been found to measure personality characteristics rather than focusing exclusively on alcohol abuse. For example, people who are aggressive and impulsive

tend to receive high scores on the MAC. Research indicates that the MAC is not influenced by the consequences of alcohol abuse, but instead measures personality characteristics that are associated with alcohol abuse, but are not exclusive to alcohol abusers (Preng & Clopton, 1986). Kranitz (1972) reported that the MAC did not differentiate between alcoholics and substance abusers, concluding that the scale measures a general addictive tendency.

As a result of the focus on the influence of personality characteristics on the MAC Scale, MacAndrew (1979) did a study which led him to conclude that the scale distinguished between two types of substance abusers. He described alcoholics who scored 24 or higher on the MAC as being characterized by a reward-seeking orientation to life, referring to them as primary alcoholics (individuals who apparently do not have a precipitating cause for drinking). Alcoholics who scored below 24 on the scale were seen as people who were motivated to avoid punishment and they were defined as secondary alcoholics (people who drink to cope with problems or stress). Later, MacAndrew (1981) reviewed the research literature and concluded that "the scale is not specific to alcoholism, to misuse of drugs, or even to addiction in it's broadest meaning" (p.605). He concluded that the MAC scale does not measure the addictive or alcoholic traits it was originally intended to measure. He

described high MAC scorers as "bold" individuals who are assertive, pleasure-seeking, and aggressive, stating that these people seem to be uninhibited, self-confident, rebellious, and resentful of authority figures.

However, some evidence conflicts with MacAndrew's (1981) hypothesis that high MAC scores are received by individuals with a reward-seeking orientation. Moore (1981) reported that MAC scores were unrelated to pleasure-seeking drinking among alcohol abusers. He found that alcohol abusers with high scores reported drinking to avoid negative feelings (to avoid punishment) more often than alcohol abusers with low scores and both high and low scoring alcohol abusers were equally likely to report drinking for pleasure.

Additional characteristics such as extroversion and introversion have been found to correlate with MAC scores. Allen, Faden, Rawlings and Miller (1991) reported that high MAC scorers seem reflective of greater extroversion and sensation-seeking, stating that low scorers were more behaviorally and emotionally repressed, and less socially oriented. High scorers were also found to be more hedonistic, aggressive, and impulsive than low scorers. Finney, Smith, Skeeters, and Auvenshire (1971) stated, "The item content of the MAC Scale suggests that high scorers are bold, self-confident people who are sociable, yet somehow rebellious. These people are drawn to religion, and use

repression and faith to temper their delinquent urges" (p. 1059). High MAC scorers have been found to have higher needs for variety, stimulation, and immediate pleasure than low scorers (Allen et al., 1991). Furthermore, Burke (1983) found that the MAC scale was positively related to measures of impulsiveness and negatively related to measures of self-control.

In addition to these characteristics, MacAndrew (1967) identified psychological factors of high scorers such as interpersonal skillfulness, freedom from parental control, feminine identification, religiousness, and guilt. He also noted the existence of physical factors such as blackouts and somatic complaints due to alcohol abuse. In one study, elevated MAC scores were related to the amount of cognitive impairment, school maladjustment, interpersonal competence, risk taking, exhibitionism, and moral indignation that the individual displayed (Schwartz & Graham, 1979).

There has been some question as to whether the MAC Scale measures stable personality characteristics or whether the traits measured are a result of substance abuse. Levenson, Aldwin, Butcher, De Labry, Workman-Daniels, and Bosse (1990) administered the MAC to a community of middle-aged and older men. The findings from their study supported the argument that the MAC is not an alcoholism scale, but rather assesses general personality traits that appear to be directly related to drinking. "The lack of correlation

between MAC Scale score and age suggests the possibility that the scale is assessing a cluster of personality traits that is stable across the lifespan" (p. 461). Evidence was also found by Knowles and Schroeder (1990) that the scale was measuring stable personality characteristics rather than traits that develop only as a consequence of dysfunctional drinking.

Searles et al. (1990) cautioned against using the MAC Scale to identify alcoholics. They administered the MAC to 770 normal subjects and to 436 subjects who had been hospitalized for substance abuse. The average score for the normals was 20 while the average score for the substance abusers was 23, only correctly identifying 26% of the substance abusing group. In light of the results of this study, it was recommended that the MAC should be used with extreme caution when applying it clinically. Holmes, Dungan, and McLaughlin (1982) also cautioned against the use of the MAC scale when assessing problem drinking. They compared the MAC and four other alcoholism scales from the Minnesota Multiphasic Personality Inventory (MMPI) and found all of these scales to be of questionable utility.

Much attention has been directed toward the differences that gender may have on MAC results. Allen et al. (1991) found that the MAC is not as effective for use on women as it is on men. They recommended using a lower cutoff score for women than the traditional 24 point cutoff. In a

previous study, Allen et al. (1990) administered the MAC Scale to 318 male and 59 female patients in an addiction treatment center. Of the males, 91% scored above the 24 point cutoff and 71% of the women scored high enough to be detected as substance abusers. "More importantly, the MAC seems associated with quite different personality constellations for male and female patients" (p. 695). High scoring males had more emotional difficulties while low scoring females had more severe emotional problems. From this study, it was concluded that for male patients, high MAC scores are associated with more severe emotional disturbance and greater impulsivity. For female patients, low MAC scores were suggestive of more depression and introversion as well as more emotional difficulties in general. While confirming prior research that MAC scores are associated with personality differences among alcohol abusing individuals, this study further suggests these differences are sex-specific. Duckworth and Anderson (1986) stated, "Female alcoholics have been studied, but much less frequently than male alcoholics. In general, their MacAndrew scores are lower than the males" (p.309). It may be more useful to use a lower cutoff score for females than the cutoff of 24 that is recommended.

Preng and Clopton (1986) have suggested the need for the use of other diagnostic instruments along with the MAC scale, stating that future research needs to examine the MAC

Scale's effectiveness in comparison to, and in conjunction with other screening measures; in particular, the need for examining the relative effectiveness of several alternative measures. "The MAC scale would be the most useful in a clinical setting if it could detect alcoholism in patients who wish to conceal, or at least minimize, their difficulties with alcohol" (p. 234).

There have been many problems in the area of diagnosing and treating alcohol abusers. Rogalski (1987) stated that one problem is many people view curtailment of alcohol use as the final goal of treatment and that many treatment providers assess only the alcohol use and disregard the personality specific problems of the chemically dependent individual. Substance abuse treatment has long been at a disadvantage due to the lack of a brief, standardized instrument that could be used to screen and assess clients, identifying treatment needs, and assess improvement during and after treatment (Grissom & Bragg, 1992).

Several shortcomings in the way alcohol abusers are diagnosed and treated have been identified. Many assessment measures simply look at the physical factors involved in alcohol abuse. Kosten, Koster, and Rounsaville (1989) found physical dependence is temporary and psychological factors are more important in bringing about relapse to a drug. Most diagnostic instruments and treatments regard alcoholics/addicts as a homogenous group, focusing on the

abuser's substance use. Rogalski (1990) found "evidence that intrapsychic and interpersonal features are relevant in detoxification and that not all addicts are psychologically or behaviorally alike" (p. 192). McLellan, Luborsky, Woody, and O'Brien (1980) stated that emphasis has been traditionally been placed on the amount, duration, and frequency of chemical use but that this classification is not significantly related to treatment outcome. McLellan, Luborsky, and O'Brien (1986) found that the information regarding the patient's substance use, the amount used, and the duration of use was the least useful for planning treatment strategies.

In response to these problems, the Addiction Severity Index (ASI) was developed by McLellan et al. (1980). It was an attempt to provide a more comprehensive and effective method for evaluating the complex problems common to the substance abusing population and to provide better treatment by differentiating individuals on the basis of their treatment needs. McLellan et al. (1980) described the ASI as a design that is based upon the assumption that addiction must be considered in the context of problems that may have contributed to or may be a result of substance use. The ASI produces a severity profile of each subject through an analysis of seven different areas - medical, employment, alcohol, drug, legal, family/social, and psychiatric. "Within the ASI, severity is defined as the need for

additional treatment, and offers a potentially different estimate of severity than other perspectives" (p. 27). In each of the seven areas assessed, objective questions measure the extent and duration of problems over the individual's lifetime and specifically during the 30 days prior to assessment. The subject also supplies a subjective report of the recent severity of problems and indicates his/her feelings about the importance of intervention and treatment in each of these areas (Hodgins & El-Guebaly, 1992).

Authors of the ASI hoped the use of this instrument would allow for comparisons among types of treatment and among geographic locations, and would relate specific therapeutic actions to outcome (McLellan, Luborsky, & O'Brien, 1986). McLellan et al. (1986) concluded that use of the ASI resulted in "more compatible treatment methods and better patient outcomes" (p. 117).

Research has produced much positive information about the ASI. Hodgins and El-Guebaly (1992) found this instrument to be reliable, valid, and very useful in monitoring clients and matching them to specific types of treatment. McLellan et al. (1980) said that the ASI may be particularly helpful in determining a treatment plan for the individual client. "An instrument such as the ASI may permit more effective matching of patients at the start of experimental treatments and a more comprehensive evaluation

of post-test outcome" (p. 33). Grissom and Bragg (1992) stated that the development of the ASI was an important advance in substance abuse treatment and research and concluded that this assessment measure has "proven to be psychometrically sound when administered by trained clinicians" (p. 56).

One of the more positive features of the ASI is that the format can be altered to meet any specific types of client/interviewer needs. Grissom and Bragg (1991) stated, "The ASI is an efficient and comprehensive instrument for both clinical and research applications. Among other desirable characteristics, the ASI is easily adapted" (p. 63). Users can modify the ASI interview by collecting more detailed information in any area significant to the particular client and by clarifying any unclear responses.

Some researchers have questioned the importance of the client's mental attitude in predicting treatment outcome with the ASI. Rogalski (1990) felt this information was relevant to treatment quality and cost effectiveness, as it could improve treatment planning and do away with unwarranted treatment procedures. The sample for this study consisted of 190 self-identified substance abusers who had been admitted to an inpatient detoxification unit. Each subject was administered the ASI and the subject's desire for psychological intervention/treatment was inspected. In this sample, 70% of the subjects felt they had emotional

problems for which they would like to receive therapy. When "discharge type was predicted considering the desire for a relationship with a clinical psychologist, we found an improved ability to predict and a refined understanding of the human aspects operating in stabilization. Psychological, physiological, and sociological factors became more apparent" (p. 192). Specific questions on the ASI address these factors.

Other areas of the ASI have been found to be helpful in predicting treatment outcome. McLellan et al. (1986) concluded that information regarding the pretreatment areas of psychiatric, employment, and legal problems of patients is likely to be essential for developing effective treatment plans for their alcohol abuse problems. The single best predictor of the patients conditions at follow-up was their psychiatric severity rating at treatment admission. "Treatments that target the reduction and elimination of alcohol and/or drug use without strongly addressing the problem areas discussed above, leave the recovering patient at significant risk for relapse" (p. 118).

Some substance abuse problems that are unique to African Americans have also been identified with the use of the ASI. Lee, Mavis, and Stoffelmayer (1991) attempted to determine whether or not the severity of life-problems of African Americans entering a substance treatment program could help explain the higher incidence of alcohol-related

health problems that have been found among African Americans in the general population. Two areas were found in which African Americans had more severe problems than Caucasions. These were employment/support and drug use (besides alcohol). "For this treatment group, employment support problems and other drug use problems may reflect conditions that precede the higher rates of alcohol-related health problems in the general population" (p. 237).

In an attempt to identify some of the perceived strengths and weaknesses of the ASI, Grissom and Bragg (1991) questioned 25 ASI users. Of these subjects, 70% felt that the range of areas covered was important and helpful; 30% said that the ASI has good reliability and validity, that the combination of objective and subjective information was valuable, and that the length of the interview was helpful in collecting large amounts of valuable data. Follow up interviews, widespread use of the ASI in research, and the positive reputation of this instrument were considered as advantageous by 15% of the participants. Of these 25 subjects, 10% cited the ease of administration as important.

Some of the weaknesses of the ASI were described as not enough coverage of important symptoms in the psychiatric section and the questions are not specific enough in the family section. Other drawbacks of the ASI were identified by Grissom and Bragg (1991), such as, it is not appropriate

for use on adolescents or individuals who have been in a controlled environment for any significant length of time. McLellan et al. (1985) concluded that "The ASI is not, and will not be, a totally satisfactory instrument to assess what is arguably the most complex health care problem in the world: substance dependence" (p. 422).

This study will compare the effectiveness of MAST, MAC, and the ASI in the detection of alcohol abuse. In addition, it will look at differences in the three tests when screening for the existence of alcohol problems in males and females.

CHAPTER 2

METHODS

Subjects

The population sample for this study consisted of 60 driving under the influence (DUI) offenders from several counties in Kansas. These individuals had been court referred to a mental health center located in a rural area, for evaluations. Of these 100 subjects, 81 subjects were males and 19 were females. All subjects were administered the Michigan Alcoholism Screening Test (MAST), the MacAndrew Alcoholism Scale (MAC), and the Addiction Severity Index (ASI). All of these DUI offenders had received a test to determine their blood alcohol content (BAC) at the time of their arrest. Out of these 100 subjects, 16 females and 45 males had a BAC of .15 or more. Of those subjects who had a BAC of less than .15, three were females and 36 were males. There were 25 subjects with a BAC of .20 or more.

Instrumentation

The measuring instruments used in this study were the MAST, MAC, and the alcohol section of the ASI. Each subject's BAC at the time of their arrest was used to determine the severity of alcohol abuse. Those individuals with a BAC of .15 or more were considered to have developed a tolerance to alcohol, therefore, to have been abusing this substance. As Ray and Ksir (1990) indicated, a BAC of .15 results in large, consistent increases in reaction time and

noticeable motor disturbance. Heavy drinkers build up a tolerance to alcohol and require a higher BAC before their performance is impaired. Those with a BAC of less than .15 were considered as not having a drinking problem.

Procedure

The subjects attended a group testing session during which each individual filled out a personal information form and completed the MAST and the MAC. The ASI was administered by a trained clinician during each subject's evaluation interview. There were 100 subjects who had valid test scores and an available BAC reading.

The tests were scored by hand. The subjects were divided into 2 groups. Those with a high BAC (.15 or above) and those with a low BAC (less than .15). Those individuals with high BACs were considered to have a more severe drinking problem than those with low BACs. The subjects were categorized in high/low groups according to each test score. A score of five or more on the MAST was considered high and a score of less than five was low. On the MAC, a score of 24 or more was high and those who scored less than 24 were considered low. A score of four or more on the ASI was high and less than four was determined to be low.

The chi square test of independence was applied to determine if the expected test scores of those individuals who had high BACs and those who had low BACs were comparable to the test scores which were actually obtained from the

sample of subjects with high/low BACs. A 2x2 table for each group was utilized to compare high/low BAC and the high/low scores received on each test. When using a 2x2 design, the chi square analysis is subject to considerable error unless a correction for continuity called Yates' correction is applied (Garrett & Woodworth, 1960). Consequently, the Yates' correction was incorporated into the chi square analysis.

All subject's scores were analyzed together. Since several of the studies discussed in chapter one reported differences in male and female responses to the MAST and the MAC, the two genders were analyzed separately after they were studied together. To discover if the MAST, MAC, or ASI are more effective when used to diagnose alcohol abuse in individuals with a higher BAC than the .15 cutoff used in this study, those subjects with a BAC of .20 and above were also analyzed as a separate group after they were studied within the group as a whole.

CHAPTER 3

RESULTS

Statistical Analysis

The chi square test of independence was used to test the null hypothesis which was: There will be no statistical evidence indicating the usefulness of the Michigan Alcoholism Screening Test (MAST), MacAndrew Alcoholism Scale (MAC), or the Addiction Severity Index (ASI) as valid diagnostic tools in the detection of alcohol abuse. Otherwise stated, there will be no significant difference between the test scores of those subjects with high blood alcohol contents (BAC) and the test scores of those with low BACs.

On the basis of the chi square test of independence (Garrett & Woodworth, 1960), no significant difference at the .05 level was found between high BAC/high test scores and low BAC/low test scores when using the MAST or the MAC for any of the groups. Neither the MAST nor the MAC correctly identified alcohol abusers within the group made up of both genders combined, the males only group, the group of females only, or the group which had BACs of .20 or more.

When applying the MAST to both genders combined, 73% of the alcohol abusers (those with a BAC of .15 or more) were correctly identified. However, the MAST identified 69% of those individuals who had BACs of less than .15 as alcohol abusers. When the group of males only were analyzed, 82%

were correctly identified but 69% were misclassified as alcohol abusing individuals. For females only, the MAST correctly identified 50% of the subjects who were abusing alcohol and identified 66% of those who had BACs of less than .15 as alcohol abusers. When analyzing all subjects together and using the BAC of .20 or more, 88% were correctly identified by the MAST and 65% of those with BACs less than .20 were identified as alcohol abusers.

In this study, the MAC correctly identified 22% of the group which consisted of both genders combined as alcohol abusers. From the male only group, 31% of the alcohol abusers were correctly identified. The MAC did not classify any of the female subjects as alcohol abusers. When using the BACs of .20 or more, 28% of the alcohol abusing individuals were correctly classified.

When using the ASI to detect the presence of alcohol abuse, no significant difference between high BAC/high test scores and low BAC/low test scores was found for any of the groups except for the male only group and the group which had BACs of .20 and above. The ASI correctly identified 65% of the alcohol abusers from the group of both genders combined but incorrectly classified 44% of those individuals with BACs of less than .15 as alcohol abusers. The ASI correctly identified 73% of the alcohol abusing individuals in the male only group and incorrectly identified 44% of those individuals with BACs of less than .15 as alcohol

abusers. When the ASI was applied to females only, 43% were correctly identified as alcohol abusers and 33% were incorrectly classified as alcohol abusing individuals. Of the group with BACs of .20 or more, 76% of the alcohol abusing individuals were correctly identified and 50% of those with BACs of less than .20 were classified as alcohol abusers.

CHAPTER 4

DISCUSSION

The present study focused on the effectiveness of the Michigan Alcoholism Screening Test (MAST), the MacAndrew Alcoholism Scale (MAC), and the Addiction Severity Index (ASI) when screening for alcohol abuse. Using the chi square analysis for comparing groups as suggested by Holmes, Dungan, and Davis (1984), the subject's test scores and their blood alcohol content (BAC) were compared. All subjects were analyzed together. Then males and females were analyzed separately. In addition, the subset of subjects with extremely high BACs (.20 or more) were studied.

When using the MAST and the MAC as instruments for the detection of alcohol abuse, no differences were found between the test scores of any individuals with a high BAC and the test scores of those with a low BAC. This may be due to the susceptibility of the MAST for falsification that was indicated by Otto and Hall (1988). Sinnett, Benton, and Whitfill (1991) stated that MAST scores can easily be manipulated and that misrepresentation of alcohol consumption is a serious problem. Regarding the MAC, MacAndrew (1981) stated that the MAC is not effective when utilized to identify the presence of any type of addiction. In addition, Holmes et al. (1984) found the MAC to be of questionable utility when screening for alcohol problems.

Results indicate that the MAST and the MAC may not be effective instruments when used for detecting alcohol abuse.

When using the ASI to detect alcohol abuse, no difference was found between the test scores of subjects with a high BAC and those with a low BAC in any of the groups except for the group made up of males only and group with BACs of .20 or more. McLellan et al. (1985) stated that the ASI is not a totally satisfactory instrument for assessing the presence of alcohol abuse. Ernhart et al. (1988) found that females often underreport their alcohol consumption more so than males, assuming that this difference was due to the gender-related stigma regarding drinking.

The results of this study indicate that the ASI may be ineffective for use with females when screening for alcohol abuse except when the BAC is .20 or more. However, these results indicate that the ASI may be effective for use with males for the detection of alcohol abuse and for both males and females who have BACs of .20 or more.

There is a need for an instrument that can accurately detect the presence of alcohol abuse. The effectiveness of the instruments that are presently available is questionable. When using the MAST, MAC, or the ASI as screening instruments for alcohol abuse, one should use extreme caution. There has been extensive research done on the MAST and the MAC, and studies of both tests have

revealed conflicting results. The effectiveness of the ASI needs to be studied more thoroughly, especially where differences in the responses of males and females are concerned.

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