RACIAL VARIATIONS ON THE MACANDREW ALCOHOLISM SCALE OF THE MMPI

by

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ABSTRACT

Special alcoholism scales have been developed using the MMPI in an attempt to achieve a more accurate identification of alcoholics than is possible with the standard MMPI scales. One such MMPI-derived alcoholism scale is the 49-item MacAndrew Alcoholism Scale (MAC: MacAndrew, 1965). Research has consistently supported the efficacy of the MAC in a variety of settings. However, the influence of moderator variables like age, sex, and race on the MAC have yet to receive sufficient empirical investigation. This study was conducted in order to determine the effect of one of these moderator variables (i.e., race) on the MAC performance of alcoholic and nonalcoholic inpatients.

Subjects for this study were 73 (27 black, 46 white) male alcoholic inpatients and 73 (27 black, 46 white) male nonalcoholic psychiatric inpatients. Two independent variables, race (black, white) and abuse status (alcoholic, nonalcoholic) were investigated by means of a 2X2 factorial design in order to determine their effect on the dependent measure, MAC scores. The behavioral/personality correlates of the MAC were determined separately for black and white patients.

Black and white alcoholics did not differ significantly on the MAC (both in terms of group mean MAC scores and

accurate identification of patients using cutting scores). Black nonalcoholics, on the other hand, scored significantly higher than white nonalcoholics on the MAC and were less accurately identified by means of MAC cutting scores. As a result, the MAC was observed to successfully discriminate between white alcoholics and nonalcoholics (66.3%) but not between black alcoholics and nonalcoholics (55.5%). This study also found that black and white patients demonstrated similar behavioral/personality correlational patterns with the MAC.

The inability of the MAC to discriminate between black alcoholics and nonalcoholics suggests that it may not be as useful with black patients as it has been with white patients. The results of the present investigation are consistent with Gynther's (1972) contention that significant racial variations exist on the MMPI, in this case on a special MMPI scale, the MAC. It was concluded, therefore, that clinically significant black-white differences were observed on the MAC.

LIST OF ILLUSTRATIONS

CHAPTER I
INTRODUCTION

Alcoholism is a major source of concern in contemporary American society. A survey by the National Institute of Alcoholism and Alcohol Abuse (NIAAA, 1972) revealed that nearly ten percent of the 95 million Americans who consume alcoholic beverages experience problems to such a degree as to be considered alcoholic. Alcoholism is reported to be the fourth most frequent health problem in the United States, ranking behind cancer, heart disease, and mental illness. Alcoholism is responsible for thousands of deaths annually and is believed to shorten the life expectancy of the average alcoholic by about 10 to 12 years (NIAAA, 1972). Accordingly, such issues as the development, identification, and treatment of alcoholism deserve further investigation.

Research concerned with the identification and detection of alcoholism presents several problems. Two of these problems will be discussed at length. First, one needs to select an appropriate measure to be used as the predictor. In this study the MacAndrew Alcoholism Scale (MAC: MacAndrew, 1965) of the MMPI was selected as the predictor variable. Second, one must identify and, if necessary, control important moderating variables (e.g., age, sex, race) which may be influencing the predictor (MAC)--criterion (alcoholism) relationship. In the present investigation potential moderating variables like age and education were restricted within a range and/or controlled statistically by means of

analysis of covariance. The variable of sex, on the other hand, was controlled by using male subjects, and the variable of race was studied as one of the independent variables. The purpose of the present study was to explore the ability of the MAC to identify alcoholism in groups of black and white subjects.

Alcoholism and the MMPI

The Minnesota Multiphasic Personality Inventory (MMPI: Hathaway & McKinley, 1940) is the objective personality measure encountered most frequently in the literature on alcoholism. Clopton (1978) has identified four areas of research in the study of alcoholism with the MMPI: marital interaction and alcoholism, prediction of response to treatment, alcoholic profile configurations, and special alcoholism scales. Only the last two areas are relevant within the context of this study since, unlike the earlier two, they deal with the identification of alcoholism.

MMPI Configurations

MMPI studies have consistently demonstrated that an elevation on Scale 4 (Psychopathic Deviate) is characteristic of alcoholics (Button, 1956; Goldstein & Linden, 1969; Hampton, 1953; Hoyt & Sedlacek, 1958; Lisansky, 1967; MacAndrew & Geertsma, 1963; Patrick, Connolly, & Overall, 1970; Rosen, 1960; Whitelock, Overall, & Patrick, 1971), although Scale 2 (Depression) also tends to be quite high (Brown, 1950; Hodo & Fowler, 1976; Overall, 1973). It has also been reported

that elevations on Scale 7 (Psychasthenia) are correlated with the severity of the alcohol abuse (Overall, 1973; Patrick et al., 1970).

The two most highly elevated MMPI scales in a profile are frequently interpreted together. This procedure, commonly referred to as the high-point pair, can provide a wealth of information about a patient. Several studies have identified the group average MMPI profile in alcoholics to be characterized by a 2-4/4-2 high-point pair (Hodo & Fowler, 1976; Hoffmann & Nelson, 1971; Huber & Danahy, 1975; Kammeier, Hoffmann, & Loper, 1973; Overall, 1973; Schroeder & Piercy, 1979; Sutker & Archer, 1979; Sutker, Brantley, & Allain, 1980). While some researchers have established the presence of high-point pairs other than the 2-4/4-2 in alcoholics, these high-point pairs typically incorporate either Scale 2 or 4 as one of the high points in the pair. For example, Tomsovic (1970) discovered the 1-2/2-1 and 2-7/7-2 high-point pairs to be as frequent in his sample of alcoholics as the 2-4/4-2 high-point pair. This finding suggests that more than one MMPI high-point pair is associated with alcoholism.

Clopton (1978) points out that a group average high-point pair procedure--which in alcoholics produces a 2-4/4-2 high-point pair--may serve to obscure important differences between subclassifications of alcoholic MMPIs. Recently, researchers have endeavored to specify subclasses of MMPI configurations commonly observed in alcoholics.

This trend appears justified in the sense that only 12 to 21% of all alcoholic MMPI profiles can be classified as 2-4/4-2 high-point pairs (Hodo & Fowler, 1976; Schroeder & Piercy, 1979). Brown (1950) administered the MMPI to 80 hospitalized male alcoholics and then rationally sorted the profiles into two groups, one labeled "chronic alcoholic, neurotic" and the other "chronic alcoholic, psychopathic." He reported that the neurotic profiles evidenced high elevations on Scale 2, followed by a peak on Scale 4, while elevations on Scales 4 and 9 (Hypomania) characterized the psychopathic group. Button (1956) also noticed two clusters of MMPI profiles in a group of alcoholics; one characterized by insight, the other by defensiveness. Consequently, it appears that alcoholic MMPI profiles tend to group themselves into two clusters, a neurotic group and a psychopathic group.

Several studies have successfully attempted to construct MMPI typologies into which alcoholics can be grouped (Goldstein & Linden, 1969; Whitelock, Overall & Patrick, 1971). Using multivariate procedures, Goldstein and Linden (1968) discovered four types of alcoholic MMPI protocols. Group I was characterized by a 2-4/4-2 high-point pair. Group II appeared to follow the pattern of a 2-7-8 high-point triad. Groups III and IV fell into a 4-9/9-4 pattern, although Group III seemed to involve sub-clinical elevations (below a T-score of 70) and included an elevation on Scale 2 as well. It could be hypothesized that further analysis

of this data (second-order factor analysis) might reduce the groups into two basic categories of alcoholic MMPI configuration (i.e. neurotic and psychopathic), a finding similar to that observed by Brown (1950) and Button (1956). Whitelock et al. (1971) noted that cluster analysis uncovered two basic MMPI profiles in a sample of alcoholics; a depressed, psychoneurotic group and a series of profiles characterized by psychopathy and poor impulse control. A number of other researchers also have observed a dichotomous breakdown of alcoholic MMPIs into psychopathic and neurotic groups, both on the standard MMPI (Donovan, Chaney, & O'Leary, 1978; Eshbaugh, Tosi, & Hoyt, 1978) as well as on the MMPI-derived MacAndrew Alcoholism Scale (MacAndrew, 1979a, 1980). Interestingly enough, this research indicates that the neurotic group tends to misuse alcohol more frequently relative to the psychopathic group (Donovan et al., 1978; Whitelock et al., 1971). In general the research in this area reveals two subgroups of alcoholics as measured by the MMPI, one neurotic, the other psychopathic.

The Development of MMPI Alcoholism Scales

Special alcoholism scales derived from the MMPI item pool have been developed in an attempt to identify alcoholism. During the 1950's three special alcoholism scales were developed empirically by contrasting the MMPI responses of groups of alcoholics with the responses of normal individuals. Hampton (1953) developed and validated his scale by con-

trasting the response patterns of a group from Alcoholics Anonymous with the response of a group seeking vocational guidance. The literature offers very little support for the validity of this scale (Apfeldorf & Hunley, 1975; Rich & Davis, 1969; Rotman & Vestre, 1964; Uecker, Kish, & Ball, 1969). For example, Uecker et al. (1969) observed a mean difference between alcoholic and nonalcoholic patients of only 1.5 raw score points, with a standard deviation of 13, which suggests the absence of any reliable difference between the two groups. Although several studies found that the Hampton scale successfully discriminated between alcoholics and normals (Apfeldorf & Hunley, 1975; Rich & Davis, 1969; Vega, 1971), only one study supports its efficacy for use in a psychiatric setting (Vega, 1971).

Hoyt and Sedlacek's (1958) alcoholism scale has not fared much better than Hampton's scale. Rich and Davis (1969) evaluated the efficiency of the Hoyt/Sedlacek scale in groups of alcoholic inpatients, psychiatric inpatients, and normal controls. They noted that the scale significantly differentiated between male alcoholics and groups of psychiatric inpatients and normal controls (accuracy of classification varied between .64 and .71), but failed to discriminate between female alcoholics and normal controls (accuracy of classification was .50). Uecker et al. (1969) found that the Hoyt/Sedlacek scale successfully contrasted alcoholics and nonalcoholic psychiatric inpatients at a

statistically significant level. Rotman and Vestre (1964), on the other hand, found no significant differences between newly admitted psychiatric patients with and without alcohol problems on the Hoyt/Sedlacek scale. When more stringent criteria for defining the alcoholic group were employed (all three criteria -- social history, self-report, diagnosis--rather than just one were required to be classified as alcoholic), a significant difference surfaced. This procedure presents two problems. First, when using the more stringent criteria less than one-third of the original alcoholic sample was included in the data analysis. Second, the alcoholics in the smaller sample were likely to be chronic alcoholics with a history of severe alcohol abuse, an observation which could be made without the aid of a psychological test. Hence, the scale may have little clinical utility. Several other studies also have observed that the Hoyt/Sedlacek scale fails to discriminate between inpatient alcoholics and nonalcoholics (Apfeldorf & Hunley, 1975; Vega, 1971).

Holmes (see Button, 1956) developed his alcoholism scale by contrasting the MMPI responses of institutionalized alcoholics with the response patterns of the original MMPI normative sample. The classification accuracy (alcoholic - nonalcoholic) of the Holmes scale has been found to vary between 62 and 78% (Apfeldorf & Hunley, 1975; Atsaides, Neuringer & Davis, 1977; Rhodes & Chang, 1978; Rich & Davis

1969; Rotman & Vestre, 1964; Vega, 1971). A study which exemplifies the research on this scale (Vega, 1971) compared alcoholics enrolled in a Veterans Administration alcoholism treatment program with two nonalcoholic control groups, a group of psychiatric inpatients, and a sample of medical inpatients. The Holmes scale reliably differentiated between the alcoholic inpatients and inpatients found in the other two conditions. Navarro (1979) applied the Holmes scale to three groups of females: Alcoholics Anonymous members, psychiatric inpatients, and normal controls. She found no significant differences between these three groups on the Holmes scale. Although the Holmes scale has received more empirical support than did its predecessors, this has only been reliably demonstrated with inpatients (Atsaides et al., 1977; Navarro, 1979).

MacAndrew and Geertsma (1964) administered the MMPI to a group of male alcoholics and a group of male nonalcoholic psychiatric outpatients in order to determine the discriminatory power of the Hampton, Hoyt/Sedlacek, and Holmes scales. They noted that all three scales were incapable of discriminating between these two outpatient groups. Similar results were reported by Hoffmann, Loper, and Kammeier (1974). MacAndrew and Geertsma (1964) concluded that since these alcoholic scales were developed by means of alcoholic-normal comparisons, the scales were, in fact, measuring general psychological maladjustment rather

than alcoholic tendencies. This explanation is probably correct in the case of the Hampton scale, which correlates .89 with the Welsh A Scale, a measure of general psychological maladjustment (Rosenberg, 1972). However, it is unlikely that this explanation accounts for all three of these alcoholism scales since the scale intercorrelations tend to be small (Clopton, 1978). Nevertheless, these studies challenge the usefulness of the Hampton, Hoyt/Sedlacek, and Holmes scales, at least for use in an outpatient setting. In general, the research evidence indicates that the Hampton and Hoyt/Sedlacek alcoholism scales are of questionable validity for use in psychiatric settings. While the Holmes scale may be useful, this has only been demonstrated with psychiatric inpatients.

The MacAndrew Alcoholism Scale

Taking note of the limitations present in earlier MMPI alcoholism scales, MacAndrew (1965) developed and validated a scale designed to measure alcoholism. He selected 300 male outpatient alcoholics and 300 male psychiatric outpatients who exhibited no problems with alcohol and compared their relative response patterns on the MMPI. In this initial study MacAndrew (1965) found 51 items which reliably separated the two groups. However, the MacAndrew alcoholism scale (MAC), as it is typically used, consists of 49 items with the two items which refer directly to alcohol usage being eliminated from the scale. These two items were eliminated primarily for two reasons: (1) it was

thought to decrease the likelihood of "fake-good" (i.e., subject avoids endorsing many "deviant" items) and "fake-bad" (i.e., subject endorses a large number of "deviant" items) response sets, and (2) it emphasized the contention that the MAC measures addictive proneness rather than merely being an estimate of alcohol intake (Butcher & Owen, 1978). MacAndrew subjected his scale to cross-validation with very little shrinkage in accuracy. Upon cross-validation the accuracy went down from 81.75% to 81.5%. MacAndrew acknowledged that minority group individuals were poorly represented in his original and cross-validation samples, although he failed to provide the actual racial breakdown.

MacAndrew (1965) originally suggested that a cutting score of 24 be used with the MAC, at or above which an individual should be considered likely to abuse alcohol. However, other studies have ascertained that more appropriate cutting scores can be derived depending upon such factors as treatment setting (DeGroot & Adamson, 1973; Huber & Danahy, 1973; Uecker, 1970; Vega, 1971; Whisler & Cantor, 1966), age (Apfeldorf & Hunley, 1975), and sex (Rich & Davis, 1969; Schwartz & Graham, 1979). The major studies which have investigated the MAC, along with suggested cutting scores and accuracy of classification ratings, can be found in Table 1.

The initial empirical investigation of the MAC yielded disappointing results. Utilizing a domiciliary population,

Table 1

Research Studies on the MacAndrew Alcoholism Scale

Study	Subjects	Cutting Score	Overall Accuracy	False Negatives	False Positives
MacAndrew (1965) (cross-validation)	Male alcoholic and psychiatric outpatients.	24	81.5%	8.5%	10%
Whisler & Cantor (1966)	Male alcoholic and normal domiciled patients.	24	55%	7.9%	37.1%
		28	61.5%	17.8%	20.7%
Rhodes (1969)	Male alcoholic and psychiatric outpatients.	24	76%	10%	14%
Rich & Davis (1969)	Male and female alcoholics, psychiatric patients, and normals.	Not Reported	73-77%		
Uecker (1970)	Male alcoholic and psychiatric inpatients.	24	69.5%	10.2%	20.3%
Vega (1971)	Male alcoholics, psychiatric inpatients, and normals.	26	71%	9.6%	19%
DeGroot & Adamson (1973)	Male alcoholic and psychiatric inpatients.	22	81%	11.5%	7.5%
Hoffmann, Loper, & Kammeier (1974)[2]	Male prealcoholics and normal controls.	26	72.3%	4%	23.7%
Apfeldorf & Hunley (1975)	Male alcoholics, offenders, and psychiatric inpatients.	27	62%	7%	30%
Atsaides, Neuringer, & Davis (1977)	Male alcoholic and neurotic inpatients.	28	67%	17%	16%
Burke & Marcus (1977)	Male alcoholics and psychiatric inpatients.	24	74%	10%	16%
Clopton & Klein (1978)	Male and female alcoholic & psychiatric outpatients.	M-25	59.8%		
		F-27	60%		
Rhodes & Chang (1978)	Male alcoholic and neurotic inpatients.	24	80.8%		
MacAndrew (1979c)	Male adolescent and alcoholic offenders, college students, and adolescent psychiatric outpatients.	24	82.1%	7.3%	10.6%
Schwartz & Graham (1979) (female data only)	Male and female alcoholic antisocial and general psychiatric inpatients.	28	76%	3%	21%
Clopton, Weiner, & Davis (1980) (cross-validation)	Male alcoholic and psychiatric inpatients.	27	66%	8%	25%

[1]Only studies reporting the percentage of patients accurately identified by the MAC are included in this table.

[2]The 51-item MacAndrew alcoholism scale was used.

Whisler and Cantor (1966) discovered that while the mean MAC scores were significantly higher in the alcoholic group, a cutting score of 24, as suggested by MacAndrew (1965), accurately classified only 55% of the sample; well below the figures reported by MacAndrew. However, a cutting score of 28 correctly classified 61.5% of these patients. Whisler and Cantor (1966) concluded that a higher cutting score may be necessary when studying domiciled patients. However, it may be that nonpsychiatric control subjects (i.e., "normals," domiciled patients, medical patients) tend to record higher MAC scores than nonalcoholic psychiatric patients (Vega, 1971) and thus are a poor choice as a control group. Although Uecker (1970) disclosed that the MAC was capable of discriminating between alcoholics and nonalcoholics in an inpatient setting, he witnessed a high rate of false positives (nonalcoholics incorrectly identified by the MAC as alcoholic). Rhodes (1969), in a replication of MacAndrew's original study, determined that a cutting score of 24 achieved a classification accuracy of 76%, while a cutting score of 28 only correctly classified 69% of the sample. Therefore, the MAC appears valid for use with subjects comparable to MacAndrew's original sample (i.e., psychiatric outpatients), although its usefulness with other types of individuals has been questioned by some researchers (i.e., Uecker, 1970; Whisler & Cantor, 1966).

While several studies have questioned the utility of

the MAC in a domiciliary (Whisler & Cantor, 1966) or inpatient (Uecker, 1970) population, a number of more recent studies have strongly supported its validity in a variety of settings. The percentage of accurate classifications (alcoholic-nonalcoholic) using the MAC has fluctuated between 60 and 82% (Apfeldorf & Hunley, 1975; Clopton, Weiner, & Davis, 1980; Conley & Kammeier, 1980; DeGroot & Adamson, 1973; Hoffmann et al., 1974; MacAndrew, 1965, 1979b; Rhodes, 1969; Rhodes & Chang, 1978; Uecker, 1970; Vega, 1971; Whisler & Cantor, 1966). Studies on the MAC in state hospitals (Clopton et al., 1980; Rich & Davis, 1969; Williams, McCourt, & Schneider, 1971; Willis, Wehler, & Rush, 1979), Veterans Administration hospitals (Apfeldorf & Hunley, 1975; Rohan, 1972; Rosenberg, 1972; Vega, 1971), general hospitals (DeGroot & Adamson, 1973) and special alcohol treatment facilities (Conley & Kammeier, 1980) have demonstrated its validity with psychiatric inpatients. Research on the MAC suggests that it is quite effective in discriminating between alcoholics and nonalcoholics in a wide variety of settings, although different cutting scores may be required based on knowledge of certain subject characteristics.

A group of researchers (Hoffmann et al., 1974; Kammeier, Hoffmann, & Loper, 1973; Loper, Kammeier, & Hoffmann, 1973) studied the MMPI scores of a group of male alcoholics tested during their freshman year in college, who had an average elapsed time of 13 years between college entrance and

commencement of treatment for alcoholism. They reported that the MAC accurately identified college freshmen who later became alcoholic; a cutting score of 26 classified 72% of the prealcoholic sample and 28% of their nonalcoholic peers as alcoholic. These results seem to suggest that the MAC is measuring stable personality traits which are important in the development of alcoholism. Moreover, these studies imply that alcoholics can be identified by the MAC prior to having their drinking behavior labeled as problematic.

In several studies the MAC has been found inadequate in differentiating alcoholics from normal controls (Navarro, 1979; Vega, 1971; Whisler & Cantor, 1966), criminal offenders (Ruff, Ayers, & Templer, 1975; Schwartz & Graham, 1979), and neurotics (Atsaides et al., 1977). Ruff et al. (1975) failed to obtain a difference between alcoholics and criminally-charged nonalcoholics on the MAC and concluded that the scale measures acting out behavior rather than addictive tendencies. Clopton (1978) questions this conclusion for two reasons: (1) while a group of noncriminal psychiatric patients, a group which tends to score well below alcoholics on the MAC, were included in this study, their MAC scores were not reported; and (2) a more equitable comparison would contrast alcoholic criminals with nonalcoholic criminals, since an alcoholic-criminal comparison entails a number of variables other than the presence or absence of alcoholism. Nonetheless, Schwartz and Graham (1979) also

reported that the MAC failed to reliably dicriminate between groups of alcoholic and disciplinary offender males.

While Atsaides et al. (1977) failed to detect a difference between alcoholics and neurotics on the MAC, the literature review they use to support this claim was restricted to a single negative study and neglects the vast majority of relevant research, most of which supports the efficacy of the scale (Clopton, 1978). Moreover, they employed a cutting score of 28, as suggested by Whisler and Cantor (1966), and failed to report the MAC classification accuracy using a cutting score of 24. Rhodes and Chang (1978) replicated their study, and by using a cutting score of 24 witnessed an appreciable increase (67% to 80.8%) in the classification accuracy of the MAC over that acheived in the Atsaides et al. (1977) study.

Finally, Navarro (1979) found no significant differences on the MAC between female Alcoholics Anonymous members, nonalcoholic psychiatric inpatients, and normal controls. However, the mean scores were unusually low (alcoholic--9.53; psychiatric inpatient--10.45; normal--7.78), suggesting that females may score lower than males on the MAC. Rich and Davis (1969) also have demonstrated a similar sex-dependent relationship on the MAC, although other factors, such as the ability of Alcoholics Anonymous members to function independently and their wealth of support systems, may also have contributed to the results obtained by Navarro

(1979).

One way to evaluate the validity of the MAC is to contrast the predictions derived from the MAC with those derived from a discriminant function constructed from the standard 13 MMPI scales. Clopton and Klein (1978) utilized this approach to contrast alcoholic and nonalcoholic outpatients. They discovered that the discriminant function outperformed the MAC with a classification accuracy of 100% for females and 91.1% for males, compared with 60% (females) and 59.8% (males) as achieved by the MAC. Clopton et al. (1980) employed a similar procedure with a group of male inpatients, but this time the two predictors were cross-validated. Although in the original sample the discriminant analysis achieved more accurate results than did the MAC (83% vs 68%), upon cross-validation the accuracy of the discriminant function shrunk to chance level (50%) while the MAC demonstrated remarkable stability (66%). This study not only highlights the importance of cross-validation procedures when using multivariate techniques, but also supports the contention that the MAC provides information not available from the standard MMPI scales.

MMPI studies have consistently shown that the MAC fails to discriminate between alcoholics and drug addicts (Burke & Marcus, 1977; Fowler, Note 1; Kranitz, 1972; Lachar, Berman, Grisell, & Schooff, 1976; Rathus, Fox, & Ortins, 1980). As an illustration of this, Kranitz (1972)

discerned that inpatient alcoholics, outpatient alcoholics, and institutionalized heroin addicts produced similar MAC scores. Lachar et al. (1976) also observed that the MAC failed to differentiate alcoholics from both heroin addicts and polydrug users. Only one study has ascertained differences between alcoholics and drug abusers on the MAC (Sutker, Archer, Brantley, & Kilpatrick, 1979). Sutker et al. (1979) commented that alcoholics produced higher MAC scores, although both groups achieved mean scores which exceeded 28. The research in this area suggests that the MAC, rather than measuring alcoholism per se, assesses propensity for addiction (Kranitz, 1972) or substance abuse (Greene, 1980). If it can be assumed that tobacco smoking is a form of addiction, then the addiction hypothesis is supported in a study by Willis et al. (1979) which demonstrated that smoking male alcoholics scored higher than nonsmoking male alcoholics on the MAC.

Another consistent finding on the MAC is that it demonstrates little change over time (Hoffmann et al., 1974) or as a function of treatment (Chang, Caldwell, & Moss, 1973; Huber & Danahy, 1973; Lanyon, Primo, Terrell, & Wener, 1972; Rohan, 1972; Rohan, Tatro, & Rotman, 1969; Vega, 1971). This stability effect has been found immediately after treatment (Huber & Danahy, 1975; Lanyon et al., 1972; Rohan, 1972; Rohan et al., 1969), as well as from three months to one year post-treatment (Chang et al., 1973; Lanyon et al., 1972;

Vega, 1971). The stability of the MAC clearly demonstrates that it is measuring more than just alcohol consumption. Instead, the scale seems to be an estimate of relatively enduring personality traits associated with alcohol and drug abuse, traits which do not appear amenable to change as a function of treatment or the passage of time.

An issue which has received little attention in the literature involves the behavioral correlates of the MAC. For example, Finney, Smith, Skeeters, and Auvenshine (1971) discerned that high scorers on the MAC are uninhibited, brash, sociable individuals who employ religiosity and repression in order to exert control over their delinquent, rebellious impulses. MacAndrew (1967) investigated the factor structure of the MAC by means of principle-components analysis and uncovered factors which reflect interpersonal skillfullness, school difficulties, freedom from parental control, female identification, religiosity and guilt, chronic deterioration, blackouts, and somatic complaints. In a large sample of U.S. Air Force psychiatric patients (N=363) Lachar et al. (1976) reported that high scores on the MAC (> 23) were correlated with excessive alcohol use, marital conflict, assaultiveness, and immaturity. High scores were much less likely to be associated with withdrawal, talkativeness, ambivalence, anxiety, and depression in this sample.

Schwartz and Graham (1979) found that individuals elevating the MAC tended to exhibit impulsive behavior, high

energy levels, interpersonal shallowness, and general psychological maladjustment, but not necessarily general antisociality. They also examined the factor structure of the MAC and found six factors: cognitive impairment, school maladjustment, interpersonal competence, risk taking, extroversion/exhibitionism, and moral indignation. Merenda and Sparadeo (1981) offer several criticisms of the manner in which the data in the Schwartz and Graham study was treated statistically. However, as Graham and Schwartz (1981) point out in response to these criticisms, Merenda and Sparadeo's rebuttal appears to overlook the practical utility of their findings.

Studies investigating the construct validity of the MAC suggest that high scorers on the MAC display: (1) facile, yet shallow, interpersonal styles; (2) poor impulse control; and (3) rigid defensive maneuvers such as repression and externalization (i.e., acting out, religiosity) in an attempt to control rebellious impulses. MacAndrew (1981), on the other hand, postulates that the MAC is measuring a bipolar dimension of character, with reward seeking at one pole and avoidance of punishment at the other.

Moderator Variables

There are a number of variables which may moderate the MMPI responses of alcoholics. The potential effects of variables like age, sex, intelligence, education, marital

status, treatment setting, and race will be discussed. Other variables which may be important, such as religious affiliation, socioeconomic status, occupation, and psychopathology, have not yet been studied sufficiently to be reviewed here.

Age

Research studies on "normal" subjects suggest that elderly males (above the age of 60) may score 10 T-score points higher on Scales 1, 2, and 3, 5 T-score points higher on Scales 5 and 0, and 5 T-score points lower on Scale 9 (Brozek, 1955; Leon, Gillium, Gillium, & Grouze, 1979; Swenson, 1961). However, adult subjects under the age of 45 or 50 are believed to manifest few, if any, age-dependent MMPI response patterns (Greene, 1980). Research on MMPI differences in adolescents reveals that Scales 4, 8, and 9 may be elevated 10 T-score points or more in groups of normal adolescents (Ball, 1962; Baughman & Dahlstrom, 1968). These studies indicate that there is probably very little variation in MMPI scores in the 18-45 age range, although persons outside this range may vary somewhat in terms of their performance on the MMPI.

Research suggests that older alcoholics (somewhere over the age of 45-60) tend to score lower on Scales K (McGinnis & Ryan, 1965), 2 (McGinnis & Ryan, 1965), 4 (Hoffmann, Jansen, & Wefring, 1972; Hoffmann & Nelson, 1971; McGinnis & Ryan, 1965), 7 (Hoffmann et al., 1972; Hoffmann & Nelson, 1971; McGinnis & Ryan, 1965), 8 (McGinnis & Ryan,

1965), and 9 (Hoffmann et al., 1972). Discordant results have been witnessed on Scale 1 (Hypochondriasis). Hoffmann et al. (1972) discerned greater elevations on Scale 1 in elderly alcoholics, whereas McGinnis and Ryan (1965) observed that scores on this scale tend to decrease with age. Perhaps these contradictory results can best be explained by the greater chronicity found in McGinnis and Ryan's institutionalized sample. Wilson, Mabry, Khavari, and Dalpes' (1977) younger alcoholics demonstrated fewer somatic complaints but registered higher scores on MMPI Scales L, 3 and 8.

Several studies have dealt directly with the effects of age on the MAC. Apfeldorf and Hunley (1975) found the MAC quite effective in contrasting older domiciled alcoholics and problem drinkers with nonalcoholics. These investigators also witnessed a negative correlation between age and MAC scores, which suggests that scores on this scale tend to decline with age. However, Friedrich and Loftsgard (1978) observed a positive correlation between age and MAC scores. Rathus, Fox and Ortins (1980) suggest that the MAC may not be as sensitive to adolescent alcoholism as it is to the adult condition. However, they conducted their study with a short form of the MAC (20 items). For a discussion of the problems inherent in the use of MMPI short forms the reader is referred to Greene (1980). Moreover, MacAndrew (1979c) compared youthful male alcohol offenders with groups

of male college students and adolescent psychiatric outpatients and discovered that the MAC reliably discriminated between alcoholics and nonalcoholics in an adolescent population. The major problem with the research on age and the MAC is the paucity of direct comparisons between alcoholics of different ages.

Sex

Research indicates that male-female differences exist on the MMPI, although the clinical significance of these differences is uncertain. In a sample of "normal" individuals, Colligan and Osborne (1977) discovered that females achieved higher scores on Scale L, while omitting a greater number of items relative to male subjects. Males, on the other hand, earned higher scores on Scales F, K, and 2 (Depression).

In an early study contrasting the MMPI performance of male and female alcoholics, Hewitt (1943) discovered that female alcoholics recorded higher scores on Scales 4 (Psychopathic Deviate), 6 (Paranoia), and 8 (Schizophrenia), while achieving lower scores on Scales 1 (Hypochondriasis) and 3 (Hysteria) relative to male alcoholics. Several other studies examining male-female differences on the MMPI have discerned that male alcoholics achieve significantly higher scores than female alcoholics on Scales L (Curlee, 1970; Zelen, Fox, Gould, & Olsen, 1966), 1, 2, and 7 (Jansen & Hoffmann, 1973), while females tend to earn higher scores on Scale 0 (Curlee, 1970; Jansen & Hoffmann, 1973). Eshbaugh,

Tosi, and Hoyt (1980), on the other hand, found few MMPI differences between female and male alcoholics sampled from the same setting but at different times (see Eshbaugh et al., 1978). Eshbaugh et al. (1980) discovered the most frequent high-point pair in the female population to be the 2-4/4-2 profile. In addition, they reported that the female profiles seemed to organize themselves into two groups--psychopathic and neurotic--a pattern which has already been documented with male alcoholics. A consistent research finding has been that male alcoholics exhibit more sex-role identity problems than female alcoholics (Curlee, 1966; McLachlan, 1975; Zelen et al., 1966). It has been discerned that male alcoholics exhibit a greater degree of somatic concern, while female alcoholics display more neurotic symptomatology, predominantly of a depressive/hysteroid nature (McLachlan, 1975; Zelen et al., 1966).

Several studies on the MAC indicate that female alcoholics attain lower scores than male alcoholics (Navarro, 1979; Rich & Davis, 1969). Schwartz and Graham (1979) observed that while female alcoholics achieved higher MAC scores than male alcoholics, this relationship was reversed in the group of nonalcoholics. They also reported that the MAC was successful in discriminating between female alcoholics and nonalcoholics, but was incapable of differentiating alcoholics from nonalcoholics in the male sample. While these differences, which tend to be on the order of from

two or three MAC items, may be statistically significant, their clinical relevance is uncertain. The MMPI research on age and sex variations in alcoholics, as well as in "normal" subjects, seems to reflect the conclusion arrived at by Curlee (1970) that the similarities far outweigh the differences.

Socioeconomic Status, Intelligence, and Education

Socioeconomic status has been found to be an important moderating variable of MMPI peformance in "normal" individuals. It has been reported that more highly educated respondents tend to endorse fewer deviant items on the MMPI clinical scales, although they do tend to elevate Scale 5 (Masculinity-Femininity) more frequently than subjects possessing less education (Dahlstrom, Welsh, & Dahlstrom, 1972; Greene, 1980). It has been ascertained that more highly educated and intelligent subjects also tend to earn higher Scale K scores, reflecting an unwillingness on their part to acknowledge unfavorable characteristics in themselves (Meehl & Hathaway, 1946).

Intellectual ability also has been found to modify the relationship between alcoholism and the MMPI. Hoffmann and Nelson (1971) examined the MMPI configurations of 143 hospitalized alcoholics and found Scales L and 1 (Hypochondriasis) inversely related and Scale 4 (Psychopathic Deviate) positively correlated with measured IQ. Similarly, Hoffmann et al. (1972) discovered that Scales 4, 5 (Masculinity-

Femininity), 8 (Schizophrenia), and 9 (Hypomania) were higher in alcoholics with more education, while Scales L and O (Social Introversion) were lower in such individuals. Friedrich and Loftsgard (1978) observed a significant inverse relationship between education and MAC scores, more highly educated subjects recording lower MAC scores.

Marital Status

It has been discerned that unmarried alcoholics obtained higher scores on Scales F, 8 (Schizophrenia), and O (Social Introversion) relative to married and separated/divorced alcoholics, while the married group earned lower scores on Scale 4 (Psychopathic Deviate) in comparison with the other two groups (Hoffmann et al., 1972).

Treatment Setting

English and Curtin (1975) compared alcoholics in three different treatment settings (state hospital, V.A. hospital, halfway house) and found setting-dependent MMPI variations. More specifically, alcoholics residing in the halfway house earned higher scores on Scales L and K and lower scores on Scale 2 while patients in the V.A. hospital tended to score higher on Scales 2, 8, and 9. Nerviano, McCarty, and McCarty (1980) found that inpatient and outpatient alcohol treatment programs attracted different types of patients. Individuals who voluntarily entered a Veterans Administration inpatient treatment program demonstrated moderate to severe neurotic disorders, whereas patients entering an agency referred

outpatient program tended to be characterologically disturbed. Thus, both the type of facility (inpatient or outpatient) and degree to which the individual enters the treatment program voluntarily may be playing an important role in the types of MMPI profiles produced by alcoholics.

Race

MMPI scores have been found to vary according to ethnic status. The response patterns of blacks, Mexican-Americans, and several additional ethnic groups on the MMPI have been explored. Since the MMPI literature on black-white differences is fairly extensive it will be reviewed in four parts based on the population studied: normals, criminal offenders, psychiatric patients, and drug abusers.

Normal Subjects. In an early investigation of black-white differences on the MMPI using normal subjects, Ball (1960) noted that black adolescent males earned higher scores on Scale 1 (Hypochondriasis) relative to their white counterparts, while black adolescent females scored significantly higher than white females on Scales F, K, 3 (Hysteria), 8 (Schizophrenia), and 0 (Social Introversion). McDonald and Gynther (1962, 1963) administered the MMPI to black and white high school students and found that even when socioeconomic status is controlled (McDonald & Gynther, 1963), substantial racial differences persist. More specifically, McDonald and Gynther (1963) discovered that Scales L, F, 1, 2 (Depression), 5 (Masculinity-Femininity),

and 9 (Hypomania) were higher and Scale 3 (Hysteria) lower in black students compared with white students; no effect was found for socioeconomic status. Butcher, Ball, and Ray (1964) examined the MMPI performance of black and white college students in order to determine the effects of age, sex, education, and socioeconomic status. They made two black-white comparisons, one with the moderating variables controlled for and the other without such controls. They observed that while these variables do contribute to the MMPI racial variations, subcultural factors also account for a significant percentage of the between group variance since the number of significant differences in the male sample increased when subjects were matched on the moderating variables. A number of other studies (Baughman & Dahlstrom, 1968; Erdberg, 1970; Harrison & Kass, 1967, 1968; Hokanson & Calden, 1960; King, Carroll, & Fuller, 1977) have also determined that statistically significant differences exist on the MMPI's of black and white normals, particularly in reference to Scales F, 8 (Schizophrenia), and 9 (Hypomania), all of which tend to be higher in black subjects. However only about 30% of all racial comparisons involving these three scales have resulted in statistically significant differences (Pritchard & Rosenblatt, 1980a). Moreover, even when these comparisons are statistically significant the actual difference does not typically exceed five T-score points (Greene, 1980; Pritchard & Rosenblatt, 1980a).

Criminal Offenders. Several early MMPI studies have noted the presence of black-white differences in groups of criminal offenders (Fry, 1949; Murphree, Karabelas, & Bryan, 1962; Panton, 1959). On the other hand, Cooke, Pogany, and Johnston (1974) found no MMPI differences between black and white offenders, and Flanagan and Lewis (1969) noted that only Scale 8 differentiated the two groups with blacks registering higher scores. Elion and Megargee (1975) discerned that Scale 4 (Psychopathic Deviate) is capable of differentiating black criminals and noncriminals, although blacks tend to score an average of five T-score points higher than whites on this scale. Finally, Holland (1979) reported that black incarcerated offenders achieved significantly higher scores on Scales F, 8, and 9 in comparison with a group of white incarcerated offenders.

Psychiatric Patients. Miller, Wertz, and Counts (1961) examined the differential endorsement of MMPI items in black and white psychiatric outpatients. They reported that black patients scored higher than white patients on Scales L, 1 (Hypochondriasis), 3 (Hysteria), 8 (Schizophrenia), and 9 (Hypomania), but scored lower on Scale 5. MMPI studies reveal that black psychiatric patients display more somatozation, projection, and denial of anxiety than white patients (Miller, Knapp, & Daniels, 1968). Costello and his associates (Costello, Fine, & Blau, 1973; Costello, Tiffany, & Gier, 1972) administered the MMPI to black

and white psychiatric outpatients and found a number of significant racial differences on individual scales and high-point pairs. For example, blacks were found to elevate Scales F, 1, 5, 8, and 9 higher than whites, while achieving a greater number of 8-6 and 2-4 high-point combinations. White subjects, on the other hand, earned higher scores than blacks on Scale 3 and produced a larger percentage of 2-7 and 4-7 high-point pairs.

Genthner and Graham (1976) found Scales F, 8, and 9 to be higher in blacks at time of admission to a psychiatric hospital but noted very few differences at discharge. Possibly the treatment served to stimulate an acculturation process in the black patients. This hypothesis is supported, in part, by the finding that the only measures demonstrating change following treatment indicated that blacks had changed in the direction of the white admission scores. Strauss, Gynther, and Wallhermfechtel (1974) found the MMPI incapable of differentiating between black psychotics and those suffering from behavior disorders, while experiencing little difficulty classifying white patients into these categories. However, Shore (1976) pointed out that a computational error was present in this study and concluded that when this error was corrected the black-white discrepancies disappeared. Clark and Miller (1971) tested the validity of the 8-6 profile type (Gilberstadt & Duker, 1965) in a sample of black V.A. inpatients. They found the cardinal features of black paranoid schizophrenics to be

very similar to those of the original (white) standardization group, although some of the surface symptoms differed between the races. While a whole host of studies reveal the presence of MMPI racial variations in psychiatric patients (Davis, 1975; Davis & Jones, 1974; Gynther, Altman, & Warbin, 1973; Klinge & Strauss, 1976), others question whether such differences exist (Marks, Bertelson, & May, Note 2; Pritchard & Rosenblatt, 1980a, 1980b). The arguments of both positions will be presented later in this paper.

Drug Abusers. Where research on black-white differences in groups of normals, criminal offenders, and psychiatric patients illustrates that blacks tend to score higher than whites on several MMPI scales, the relationship is reversed with drug abusers. Penk and Robinowitz (1974), for example, found that white opiate and nonopiate drug abusers achieved higher scores on Scales F and 3 (Hysteria) relative to black drug abusers. In a later study, Penk, Woodward, Robinowitz, and Hess (1978) established that black heroin users scored lower than whites on MMPI Scales F, 2 (Depression), 4 (Psychopathic Deviate), 7 (Psychasthenia), 8 (Schizophrenia), and 0 (Social Introversion), when age, IQ, and socioeconomic status were controlled with the aid of analysis of covariance. A number of other researchers have found similar results (Patalano, 1978; Penk, Robinowitz, Roberts, Dolan, & Atkins, 1981; Sutker, Archer, & Allain, 1978). Only one study (Hill, Haertzen, & Glaser, 1960) failed to follow this basic pattern.

They found that white drug addicts attained higher scores on Scale 2, but that black addicts registered higher Scale 1 (Hypochondriasis) scores. Some have speculated that these MMPI results suggest that white individuals who develop drug problems are more disturbed than are blacks who become addicted to drugs (Gynther & Green, 1980).

One viewpoint concerning the origin of black-white differences on the MMPI holds that these variations are real, significant, and constitute bias against nonwhite respondents (Gynther, 1972; Gynther & Green, 1980; Powell & Johnson, 1976). However, other researchers take the position that the MMPI variations commonly observed between racial groups may be more a function of differences in education, intelligence, or psychopathology than a function of race or culture (Davis & Jones, 1974; Pritchard & Rosenblatt, 1980a, 1980b; Rosenblatt & Pritchard, 1978). Four issues relevant to racial variations on the MMPI will be discussed: education, intelligence, psychopathology, and methodology.

Costello, Tiffany and Gier (1972) matched black and white outpatients on sex, socioeconomic status, age, hospital status, and duration of illness. They then collapsed their analysis over the individual MMPI scales and ascertained a statistically significant difference between the two racial conditions even when the moderator variables were controlled for by matching. However this difference was the equivalent

of less than two T-score points. Furthermore, the significant interaction between race and MMPI scales makes interpretation of the significant main effect for race difficult. Costello et al. (1972) concluded that although education may interact with race to produce differential MMPI configurations, the primary source of variance between the groups can be accounted for by race. However, a study by Cowan, Watkins, and Davis (1975) failed to support this claim. Cowan et al. (1975) administered the MMPI to several groups of black and white psychiatric patients stratified by educational level, and then employed a two-step decision rule designed to classify subjects as either schizophrenic or nonschizophrenic (Rule 1: Scale 8> T-score of 70; Rule 2: Scale 8> Scale 7). They concluded that racial variations on the MMPI may be more a function of education rather than cultural factors, since the MMPI successfully discriminated between schizophrenic and non-schizophrenic patients in both white conditions and in the high education black condition. However, it failed to differentiate between black schizophrenics and nonschizo-phrenics with less than 12 years of education. Cowan et al. (1975) speculated that education may serve to reduce the enculturating effects associated with race which tend to be more prominent in less educated blacks. Davis and Jones (1974) performed a similar study and also established that the MMPI was capable of discriminating schizophrenics from

nonschizophrenics in all conditions except for the less educated black group. Davis, Beck, and Ryan (1973) compared age-equivalent groups of black and white schizophrenics on two levels of education ($\geq$12, $\leq$11). The only noteworthy discovery was that whites scored higher on Scale 2 (Depression) relative to their black counterparts. However, more poorly educated subjects earned higher scores on Scales 1 (Hypochondriasis), 4 (Psychopathic Deviate), 6 (Paranoia), and 8 (Schizophrenia). McGill (1980) also reported that education may account for many of the black-white differences found on the MMPI.

In an investigation of black-white differences on the MMPI, Roen (1960) concluded that many of the racial effects he observed could be attributed to the wide spread in intellectual ability characteristic of his sample. Murray, Heritage, and Holmes (1976) failed to detect any black-white differences on the Mini-Mult in a group of delinquent adolescents matched for IQ. They surmised that this demonstrated that the Mini-Mult is less biased against nonwhite subjects than is the standard MMPI. However, another explanation is also feasible. This study may highlight the role played by intelligence in the development of racial discrepancies on the MMPI, since the adolescents were matched on IQ. Rosenblatt and Pritchard (1978) conducted a study to investigate the effects of levels of intelligence ($<$94, $\geq$94) on black-white differences on the MMPI. They

discovered that while the MMPI was able to discriminate between blacks and whites with IQs less than 95, it failed to do so at the higher IQ level. Hence, intelligence is a potential moderator of racial variations on the MMPI. The MMPI literature concerning the influence of education and intelligence upon black-white MMPI variations suggests that racial differences exist predominantly when subjects with IQs below 95 or less education are compared across ethnic groups. Otherwise, the putative "differential validity" of the MMPI according to racial groups is minimal.

Another variable which may moderate racial differences on the MMPI is psychopathology. Pritchard and Rosenblatt (1980a, 1980b) postulate that differences in the degree of psychopathology may account for many of the MMPI variations traditionally attributed to race. They suggest that unless racial groups are matched for psychopathology, mean differences between the groups on various MMPI scales can not justifiably be attributed to race.

Several methodological issues have been raised concerning research on ethnic status and its impact on the MMPI. Pritchard and Rosenblatt (1980a) suggest that contrasting mean scores of different racial groups, an approach used frequently in research on racial differences, is inadequate for three reasons: (1) there are differences in the slope of the regression line for each racial group; (2) there is a lack of specificity since factors like

education and psychopathology cannot be ruled out; and (3) significant mean differences are not necessarily clinically relevant. They recommended use of the "accuracy test" in which the accuracy of behavioral predictions made by the MMPI are evaluated for each racial group separately. For example, rather than comparing black and white alcoholics simply on mean MAC scores, it would seem more appropriate to compare racial groups in terms of how the MAC ($\geq$24) scale correlates with such behaviors as impulsivity, defensiveness and alcohol abuse. A second methodological issue concerns the dependent measures employed. Costello et al. (1972) ascertained that different dependent measures--mean scores, proportion of scales over T-score of 70, high-point pairs--are not always comparable since the interaction term (Race X Dependent Measures) was found to be statistically significant. Finally, it has been established that different selection criteria (e.g., not including a profile because of high validity scale elevations vs inclusion of all profiles regardless of validity scores) also tends to influence the outcome of research in the area of race and the MMPI. The last two points suggest that caution should be exerted by investigators in defining dependent measures and selection criteria and in generalizing their results to other research situations.

Research has also been conducted on the MMPI performance of racial groups other than blacks. In reviewing the MMPI literature on Mexican-

Americans, Greene (1980) noted that Mexican-Americans tend to score higher on Scales L and K and lower on the clinical MMPI scales relative to white respondents. He speculated that Mexican-Americans are either experiencing less distress or else are more guarded in terms of its expression. There have also been a few studies which have explored the MMPI responses of Chinese and Japanese individuals.

Gynther and Green (1980) concluded that racial variations, in general, and black-white differences in particular, are evident on the MMPI, are more pronounced in normal compared with psychiatric/criminal populations, and mostly involve Scales F, 8 (Schizophrenia),and 9 (Hypomania). Witt and Gynther (1975) hypothesized that these racial variations are a result of subcultural differences in the interpretation of MMPI materials. While this conclusion is partially supported by research which has demonstrated subcultural influence on MMPI variations (Gynther, Fowler, & Erdberg, 1971; Harrison & Kass, 1968), Witt and Gynther compared blacks and whites on a subset of individual MMPI items. Their conclusion, therefore, can be contested on two grounds. First, although racial differences do exist at the item level (Harrison & Kass, 1967; Jones, 1978; Costello, 1973), these differences tend to cancel each other out at the scale level (Harrison & Kass, 1967). Second, the MMPI was developed in the spirit of empiricism, with little regard for item content, and so conclusions based on the interpretation of MMPI

content are highly suspect. Another group of researchers (Davis & Jones, 1974; Pritchard & Rosenblatt, 1980a, 1980b) maintain a skeptical view of the position held by Gynther and his supporters, suggesting instead that factors like education, intelligence, and psychopathology can account for the racial relationship observed on the MMPI. One should keep in mind that a compromise position is possible; that is, that the MMPI variations between racial groups are a result of an interaction between subcultural and moderating variables. Greene (1980) notes that the MMPI differences found between racial groups are typically no greater than five T-points and comments that while such differences may be statistically significant, their clinical implications are limited.

Racial Differences in Alcoholism on the MMPI

A thorough review of the research literature uncovered seven studies relevant to the issue of racial differences in alcoholics on the MMPI. In a pair of master's theses, Epstein (1970) and Hugo (1970) found few black-white differences between groups of alcoholics and the similarities seemed to outweigh the differences. Hugo (1970) reported that only Scale L differentiated these two groups, with blacks earning higher scores. Epstein (1970), on the other hand, discovered that Scales 2 (Depression) and 4 (Psychopathic Deviate) were the two most highly elevated scales in both samples, although whites achieved higher scores on

Scale 2 and blacks earned higher scores on Scale 9 (Hypomania). However, these racial differences only ranged between two and six T-score points.

Ludmar (1979) examined the MMPI profiles of 50 white and 30 black male alcoholics who were voluntarily enrolled in an alcohol treatment program. She noted that the black alcoholics registered higher scores on Scale 9 and lower scores on Scale 0 (Social Introversion) compared with the white alcoholics. Using a large sample of DWI (driving while intoxicated) offenders, Sutker et al. (1980) failed to find a relationship between race and the MMPI.

In a recent study Patterson, Charles, Woodward, Roberts, and Penk (1981) compared black and white alcoholics on the standard MMPI scales. White alcoholics scored significantly higher on Scale 3 and significantly lower on Scale 9 relative to black alcoholics. A multivariate analysis of variance (MANOVA) approached statistical significance. When age, education, and socioeconomic status were controlled for by means of multivariate analysis of covariance, black-white differences were even smaller, although whites continued to score higher on Scale 3. In this study there was also a trend witnessed in which black alcoholics presented as less disturbed, achieving lower mean scores on seven of the ten clinical scales. Patterson et al. (1981) concluded that there was no consis-

tent evidence for the "racial bias hypothesis" in the sample of alcoholics studied.

Uecker, Boutilier, and Richardson (1980) compared the MMPI performance of 40 American Indian veterans with that of 40 white veterans admitted to a Veterans Administration alcoholism treatment program. The samples were matched on age, education, and severity of alcoholism. There were no significant group differences noted on the MAC, and a cutting score of 24 on the MAC correctly identified 85% of the Indians and 80% of the whites as alcoholics.

In addition, Lachar et al. (1976) failed to observe any significant black-white differences on the MAC in a sample of drug abusers. False positive estimates could not be derived, however, since nonalcoholic control groups were not used in any of the studies reviewed. The absence of nonalcoholic controls is a major methodological flaw evident in each of these studies. Only by contrasting nonalcoholic control subjects with an alcoholic population can the true discriminative power of the MAC be realized. Although MacAndrew (1981) concluded that the MAC is insensitive to racial differences, he acknowledges that the empirical support for this hypothesis is sparse.

The purpose of the present study was to evaluate the effects of race (black, white) on the MAC performance of alcoholics and nonalcoholics. Based upon past research, the MAC should be able to discriminate between alcoholics

and nonalcoholics regardless of whether they are black or white. However, the efficiency of the MAC with nonwhite subjects cannot be taken for granted, given that nonwhite subjects were grossly underrepresented in MacAndrew's (1965) normative sample.

Three hypotheses were investigated in the present study. First, it was predicted that black and white alcoholics should not differ significantly in terms of mean MAC scores. Second, it was hypothesized that the MAC should be capable of discriminating between alcoholics and nonalcoholics in separate samples of black and white inpatients. Third, it was speculated that black and white patients would exhibit similar behavioral and personality correlational patterns with the MAC.

CHAPTER II
METHOD

Subjects

In order to determine the number of subjects needed to adequately fill each experimental cell a power analysis of the MAC was performed (Cohen, 1969; Keppel, 1973). Eleven studies which provided descriptive (means and standard deviations) data on male alcoholic-nonalcoholic comparisons within a psychiatric setting were included in this analysis. Using the procedure outlined in Keppel (1973), a power value of .80, and the squared mean standard deviation as an estimate of the pooled error variance, the optimal number of subjects in each cell ranged from six (DeGroot & Adamson, 1973; MacAndrew, 1965; Rhodes, 1969; Rich & Davis, 1969; Vega, 1971) to 85 (Whisler & Cantor, 1966). Averaged over all eleven studies the optimal cell size was calculated to be 9 for a power of .80 and 10 for a power of .90. A more conservative estimate of cell size was used, however, to compensate for the fact that these eleven studies included very few minority subjects. Since the power analysis revealed that a cell size of 14 achieved a power of .99, a cell size of 15 was established as the minimum value. It was determined that the cell size used in the present investigation (black cells = 27, white cells = 46) produced a power of .94. This level of power suggests that the cell sizes used were sufficient in terms of drawing meaningful conclusions from the results.

The subjects in the present study were 73 (27 black, 46 white) male alcoholic inpatients and 73 (27 black, 46 white) male nonalcoholic psychiatric inpatients. This sample was restricted to active duty military males between the ages of 18 and 45 with 9 to 16 years of education. Furthermore, only patients achieving estimated IQs of at least 75 were included in the study. If there was no intellectual measure available on a patient, nine years of education was used as the cutting point for inclusion in this study.

The alcoholic subjects were male inpatients hospitalized in the Alcohol Treatment Unit (ATU) at William Beaumont Army Medical Center. All patients in the alcoholic condition exhibited an extensive history of alcohol abuse and met the DSM III (APA, 1980) criteria for alcohol dependence or alcohol abuse. These patients were detoxified on a medical ward prior to being placed in the ATU. They were administered the MMPI approximately three weeks after admission to the unit with a range of from two to four weeks. Administration of the MMPI at least two weeks post-detoxification seemed appropriate since research suggests that before, during, and shortly after detoxification alcoholics exhibit a greater than usual number of psychotic features on the MMPI (Libb & Taulbee, 1971). A two week period seemed more than sufficient since Claiborn & Greene (1981) observed few "toxic" neuropsychological effects attributable to alcohol in a group of recovering alcoholics

one week after hospitalization.

Since MMPIs were unavailable for psychiatric inpatients at William Beaumont Army Medical Center, the nonalcoholic control group was sampled from the inpatient psychiatric ward at Dwight Eisenhower Army Medical Center. These patients completed the MMPI approximately 10 days after admission the inpatient service with a range of from 4 days to 4 weeks. Each nonalcoholic patient's clinical chart was inspected in order to rule out the presence of alcohol or drug abuse. Additionally, subjects with organic brain syndrome diagnoses were eliminated from the nonalcoholic psychiatric sample.

In order to determine whether the Dwight Eisenhower Army Medical Center inpatients were comparable to psychiatric patients hospitalized at William Beaumont Army Medical Center a series of statistical analyses were computed between these two groups. There were no significant differences noted between the Dwight Eisenhower psychiatric inpatients used in the present investigation (N = 73) and a sample of William Beaumont psychiatric inpatients (N = 27) on several demographic characteristics: age, F (1, 98) = 1.67, $p>.10$; education, F (1, 98) = .01, $p>.10$; military rank, F (1, 98) = 1.77, $p>.10$; marital status, $\chi^2(2) = 2.57$, $p>.10$; diagnosis, $\chi^2(3) = 6.02$, $p>.10$; and previous psychiatric history, $\chi^2(1) = .01$, $p>.10$.

Measures

MMPI

The Minnesota Multiphasic Personality Inventory (MMPI)

was developed by Hathaway and McKinley (1940) as a measure designed to detect various forms of psychopathology. The MMPI consists of 550 statements to which the subject responds either true or false in terms of whether or not the statement is characteristic of him/her. The MMPI scales were derived empirically by contrasting the response patterns of various criterion groups (e.g., hypochondriacs, schizophrenics) with the endorsement patterns of normal control subjects. This procedure produced three validity scales, L, F, and K, and ten clinical scales, 1 (Hypochondriasis), 2 (Depression), 3 (Hysteria), 4 (Psychopathic Deviate), 5 (Masculinity-Femininity), 6 (Paranoia), 7 (Psychasthenia), 8 (Schizophrenia), 9 (Hypomania) and 0 (Social Introversion).

Numerous special scales have been developed from the 550 MMPI items in an attempt to answer more specific diagnostic questions. One such scale is the MacAndrew Alcoholism Scale (MAC). The MAC consists of 51 items which were found to significantly differentiate between alcoholic and nonalcoholic psychiatric outpatients (MacAndrew, 1965). However, the present investigation employed the 49-item MAC scale with the two items which refer directly to alcohol usage (i.e., 215 & 460) being eliminated. A copy of the MAC items is included in Appendix B.

Measures of Intelligence

Since this study employed data which were already routinely collected at the institutions involved, no one

measure of intellectual ability was available for all subjects. The William Beaumont alcoholic inpatients were administered the Cattell Culture Fair Intelligence Test, whereas psychiatric inpatients at Dwight Eisenhower were administered either the Wechsler Adult Intelligence Scale (WAIS) or Shipley-Hartford Institute of Living Scale. The interested reader is referred to Cronbach (1970) for more detailed information on the WAIS and Cattell test. The utility of the Shipley-Hartford as an estimate of the WAIS Full Scale IQ has been documented in several studies (cf. Bartz & Loy, 1970; Paulson & Lin, 1970; Sines & Simmons, 1959). Due to the lack of a single IQ measure and since several subjects were administered no intelligence test at all, these IQ estimates were used solely as a basis for eliminating subjects whose limited intellectual resources (i.e., IQ<75) may have invalidated the MMPI results.

Chart Audit Form

The chart audit form was used to record demographic and behavioral information (see Appendix A). The information collected using the chart audit form included age, education, ethnicity (black, white), military rank (junior enlisted, NCO, junior officer, field grade officer), current marital status (single, married/widowed, divorced/separated), and diagnosis (schizophrenic spectrum, personality disorder, neurotic spectrum, other). The behavioral correlates also were collected on the chart audit form.

Behavioral correlates were gathered from the patient's clinical chart, which included a detailed psychiatric history, current mental status, and present ward behavior. One of four raters entered the relevant information on a modified version of Marks, Seeman, and Haller's (1974) "checklist of descriptive terms." Only those behavioral correlates attained by at least 15%, but no more than 85%, of the entire sample were analyzed in order to eliminate very low and very high base-rate behaviors. Twenty-one of the original 42 categories met these requirements (see Table 7). In order to achieve an estimate of inter-rater agreement, the charts of 36 randomly selected patients (18 alcoholics, 18 nonalcoholics) were independently analyzed by two raters. Agreement between raters for items checked present ranged between 15.4 and 87% with a median value of 57.1%. When both items checked and items not checked were considered, the median inter-rater agreement was found to be 83.3%. These estimates seem reasonable for at least a moderate degree of reliability in the ratings.

Procedure

Two independent variables, race (black, white) and abuse status (alcoholic, nonalcoholic), were investigated by means of a 2X2 factorial design in order to determine their effect on the dependent measure, the MAC scale. In most cases, Form-R of the MMPI and a measure of intellectual ability were administered individually and handscored either by the

experimenter or an Army Behavioral Science Technician trained in psychometrics. The MAC, 13 standard validity and clinical scales of the MMPI, and a variety of special MMPI scales, which included the 13 Wiggins (1966) Content scales, the Welsh (1956) Anxiety (A) and Repression (R) scales, Dependency scale (Dy: Navran, 1954), Dominance scale (Do: Gough, McClosky, & Meehl, 1951), and Overcontrolled-Hostility scale (O-H: Megargee, Cook, & Mendelsohn, 1967), were scored for the purposes of this study. The interested reader should consult Greene (1980) for a description of these scales.

The criteria used to define an MMPI protocol as invalid or unusable tends to vary from study to study and the research evidence in this area is also unclear. Several of these criteria will be discussed in turn. Clopton and Neuringer (1977) discovered that if a subject leaves 30 or more items unanswered (Scale ?) the clinical scales may be suppressed and the high-point pair will often be inaccurate. Greene (1980), on the other hand, feels that as few as 10 omitted items may significantly influence the configuration of an MMPI profile.

An inconsistent or erratic response set on the MMPI can be as detrimental as the omission of a large number of responses. An MMPI scale designed to detect such inconsistency is the TR Index (Dahlstrom, Welsh, & Dahlstrom, 1972). This index contains the number of repeated items

(out of a total of 16) which are endorsed inconsistently. Greene (1980) reports that a score of 5 or more on the T-R index reflects inconsistent responding.

A great deal of controversy surrounds elevations on Scale F and the meaning to be attached to such elevations. For instance, Hathaway and Meehl (1951) and MacAndrew (1965) maintain that a protocol should be considered invalid once F reaches or exceeds a raw score of 16. Apeldorf and Hunley (1976), however, report that such a procedure eliminates important data on problem drinkers and alcoholics with no appreciable gain in statistical precision or power. For this reason, and also because F tends to be higher in blacks than whites (Gynther, 1972), this scale was not used to define profiles as invalid.

MacAndrew (1979b) suggests that scores greater than eight or nine on Scale L of the MMPI identify a profile as possibly invalid. This observation appears reasonable and finds support in the work of other MMPI researchers (cf. Greene, 1980).

The following three rules (each employing raw score values as cutting points) were used to classify MMPI profiles as invalid for the purposes of the present study. If a protocol satisfied any one of the following three criteria it was considered invalid and discarded from the experimental sample. The criteria are as follows:

Rule 1: Scale ? > 10.

Rule 2: Scale L > 9.

Rule 3: TR Index > 4.

Eleven potential subjects (3 alcoholics, 8 nonalcoholics) were eliminated from the experimental design because they satisfied one or more of these criteria.

CHAPTER III
RESULTS

Preliminary Analyses

Table 2 provides descriptive data on the age, education, military rank, and marital status of the subjects in each of the race (black, white) by abuse status (alcoholic, non-alcoholic) groups. Significant age, education, military rank, and marital status differences were noted between alcoholics and nonalcoholics. However, none of these variables was significantly correlated with the MAC, as the final column in Table 2 illustrates. Although age and MAC scores are uncorrelated when black and white patients are considered together, they are negatively correlated in black patients, r (52)= -.32, $p<.05$, and positively correlated, although at a nonsignificant level, in white patients, r (90)= .16, $p=.11$. Furthermore, age and the MAC were found to correlate -.34 ($p=.08$) in the black alcoholic group and -.43 ($p<.05$) in the black nonalcoholic group. Due to the significant alcoholic-nonalcoholic age differences and the fact that age was inversely correlated with the MAC in black patients, age variations were statistically controlled. However, the results of these analyses are reported only when they differ from the findings provided by the standard, uncorrected analyses.

In an attempt to explore further the racial variations witnessed in the correlation between age and the MAC, age was dichotomized at the median (<30, ≥30) and set against race

Table 2

Age, Education, Military Rank, and Marital Status Differences Between Black and White Alcoholics and Nonalcoholics

	Black Alcoholics (N-27)		Black Nonalcoholics (N=27)		White Alcoholics (N=46)		White Nonalcoholics (N=46)		Race	Abuse Status	RaceX Status Interaction	Correlation
	M	SD	M	SD	M	SD	M	SD	F	F	F	r
Age	33.41	5.51	24.41	4.80	34.89	5.26	26.26	7.41	2.63	77.95***	.03	.01
Education	12.37	1.18	12.11	1.25	12.98	1.39	11.91	1.55	.75	11.23***	2.89	.00
Military Rank	1.81	.48	1.48	.51	2.17	.74	1.59	.62	4.78*	23.10***	1.42	.03

	FREQUENCY				χ^2	χ^2	r_{pb}
Marital Status					1.23	18.42***	
Single	18.5%	55.6%	13.0%	43.5%			-.01
Married/Widow.	59.2%	33.3%	63.0%	43.5%			.06
Divorced/ Sep.	22.2%	11.1%	23.9%	13.0%			-.07

[1]For military rank: field grade officer=4, junior officer=3, NCO=2, junior enlisted=1.

* p<.05
** p<.01
*** p<.001

(black, white) in a factorial analysis of variance design with MAC scores serving as the dependent measure. While the main effects for race, F (1, 142)= 2.49, $p>.10$, and dichotomized age, F (1, 142)= .62, $p>.10$, failed to achieve significance, the interaction between these two variables did, F (1, 142)= 4.62, $p<.05$. This finding suggests that age and race interact at a statistically significant level in their relationship with the MAC.

Primary Analyses

The results of a two-way analysis of variance (race x abuse status) of MAC scores can be found in Table 3. Table 4, on the other hand, provides the mean MAC scores of subjects in each of the four groups and Figure 1 graphically illustrates the significant race x abuse status interaction. The significant race x abuse status interaction observed on the MAC scale, F (1, 142)= 6.64, $p<.05$, makes interpretation of the significant abuse status main effect difficult. Therefore, the simple main effects for both race and abuse status were calculated. While the mean MAC scores of white alcoholics and nonalcoholics were significantly different, F (1, 90)= 13.07, $p<.001$, the MAC scores of black alcoholics and nonalcoholics were not, F (1, 52)=.18, $p>.10$. The mean MAC score difference between black and white alcoholics did not achieve significance, F (1, 71)= .59, $p>.10$, although black nonalcoholics achieved significantly higher MAC scores than white nonalcoholics, F (1, 71)= 8.06, $p<.01$.

Table 3

2X2 Factorial Analysis of Variance of MAC Scores

Source	SS	df	MS	F
Factor A (Race)	40.71	1	40.71	2.46
Factor B (Abuse Status)	121.16	1	121.16	7.31**
AxB Interaction	110.04	1	110.04	6.64*
Residual	2354.34	142	16.58	
Total	2626.25	145		

* $p<.05$

** $p<.01$

Table 4

Means and Standard Deviations of MAC Scores
For Black and White Alcoholics and Nonalcoholics

		Abuse Status					
		Alcoholic			Nonalcoholic		
		N	M	SD	N	M	SD
Race	Black	27	26.92	3.76	27	27.37	3.98
	White	46	27.63	3.80	46	24.48	4.53

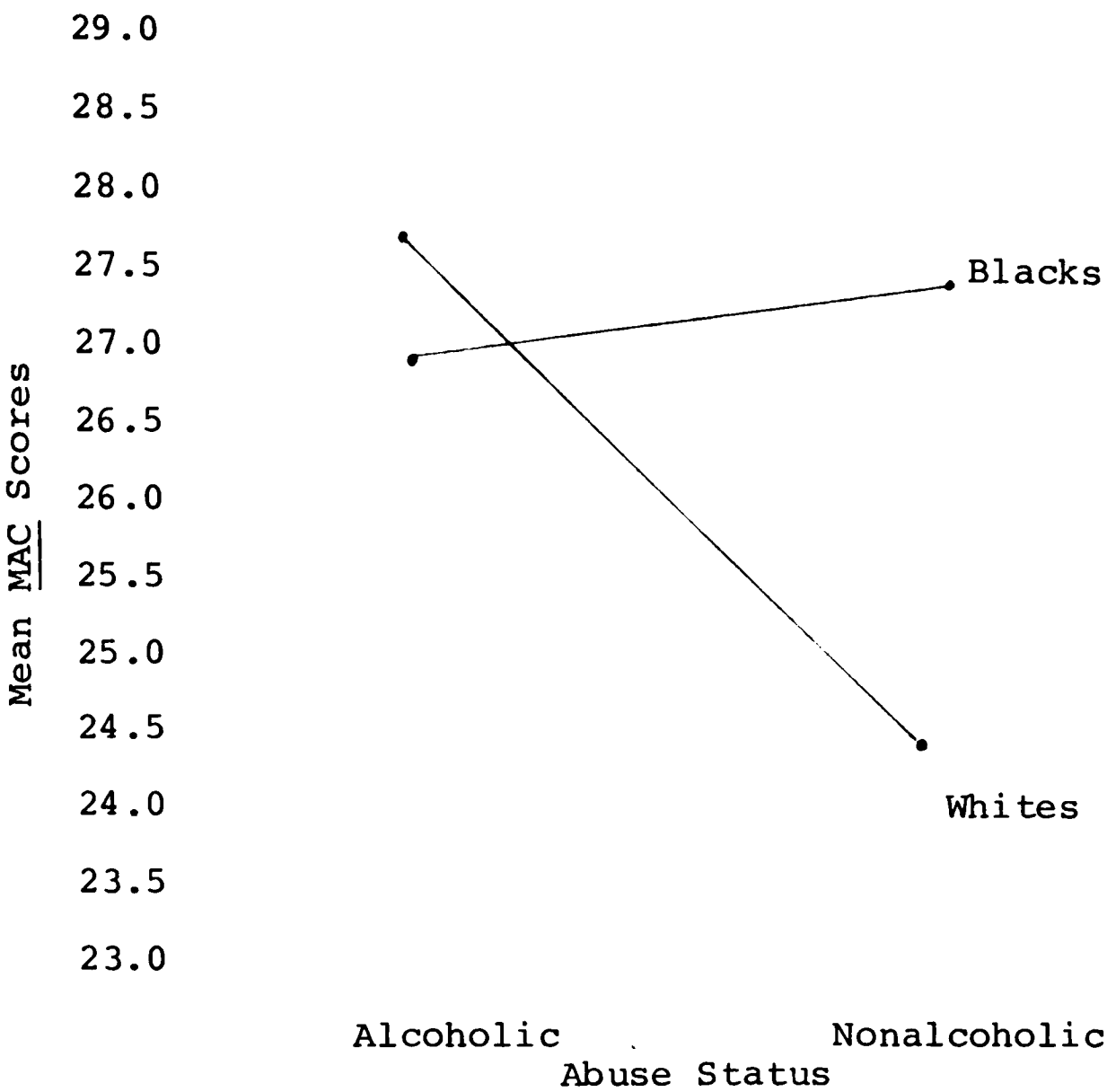

Figure 1: Interaction Pattern Between Race and Abuse Status for Black and White Patients on the MAC.

The MAC cutting score which produced the greatest number of correct classifications (alcoholic, nonalcoholic) was determined for black and white patients separately. A cutting score of 24 on the MAC correctly identified 38 (82.6%) of the white alcoholics and 23 (50%) of the white nonalcoholics for an overall classification accuracy of 66.3%. This hit rate was found to be statistically significant, $\chi^2(1) = 10.95$, $p < .001$. A cutting score of 25 accurately identified 23 (85.2%) of the black alcoholics but only 7 (25.9%) of the black nonalcoholics. The overall rate of correct identifications (55.5%) found in the black sample did not exceed chance expectations, $\chi^2(1) = 1.09$, $p > .10$.

Further analysis of the percentage of accurate classifications revealed no significant differences between black and white alcoholics in terms of the number of cases correctly identified, $\chi^2(1) = .07$, $p > .10$. However, the MAC was found to be more successful in identifying white nonalcoholics than it was in identifying black nonalcoholics, $\chi^2(1) = 4.08$, $p < .05$.

Nonalcoholic Black-White Differences

Black and white nonalcoholics were compared since much of the ineffectiveness of the MAC with black patients appeared attributable to the unusually high MAC scores achieved by black nonalcoholics. There were no significant differences noted between the groups of black and white nonalcoholics in terms of age, education, military rank, marital status, or

psychiatric history (see Table 5). However, black nonalcoholics were more frequently diagnosed with schizophrenic spectrum diagnoses (DSM III: schizophrenic and schizophreniform disorders), whereas white nonalcoholics were more often provided with DSM II neurotic diagnoses (DSM III: conversion disorder, hypchondrical disorder, obsessive-compulsive disorder, dysthymic disorder, dissociative disorder). While a point-biserial correlation reflects a significant negative correlation between the MAC and neurotic disorders, r_{pb} (71)= -.32, $p<.01$, no relationship was observed between the MAC and schizophrenic spectrum disorders, $r_{pb}(71)= .07$, $p>.10$.

The means and standard deviations of the raw scores achieved by black and white nonalcoholics on the 13 standard MMPI scales can be found in Table 6. A statistically significant overall difference was noted between black and white nonalcoholics on the MMPI: MANOVA F (13, 59)=2.04, $p<.05$. Inspection of the univariate F ratios revealed that black nonalcoholics scored significantly higher than white nonalcoholics on the MMPI L scale, F (1,71)=4.79, $p<.05$.

Behavioral/Personality Correlates

The point-biserial correlations between the MAC scale and 21 behavioral ratings can be found in Table 7. Table 8 provides the Pearson Product-Moment correlations between the MAC and 31 MMPI scales. These correlations were calculated for black and white patients separately. Partial correlations, with age controlled, were also calculated and are included in

Table 5

Demographic Differences Between Black and White Nonalcoholics

	Black Nonalcoholics (N=27)		White Nonalcoholics (N=46)		
	M	SD	M	SD	F
Age	24.41	4.80	26.26	7.41	1.35
Education	12.11	1.25	11.91	1.55	.32
Military Rank	1.48	.51	1.59	.62	.56
	FREQUENCY				χ^2
Marital Status					1.00
Single	55.6%		43.5%		
Married/Widowed	33.3%		43.5%		
Divorced/Separat.	11.1%		13.0%		
Psychiatric History					.59
Present	7.4%		13.0%		
Absent	92.6%		87.0%		
Diagnosis					
Schizophrenic	55.6%		28.3%		5.24*
Neurotic Disorders	7.4%		39.1%		8.61**
Personality Dis.	14.8%		17.4%		.07
Other	22.2%		15.2%		.58

* $p<.05$
** $p<.01$

Table 6

Mean Scores on the 13 Standard MMPI Scales for Groups of Black and White Alcoholics and Nonalcoholics

	Black Alcoholics (N=27)		Black Nonalcoholics (N=27)		White Alcoholics (N=46)		White Nonalcoholics (N=46)	
	M	SD	M	SD	M	SD	M	SD
L	3.74	2.21	5.96	2.19	3.65	2.14	4.63	2.68
F	8.48	6.79	13.30	10.76	6.54	3.02	10.46	7.83
K	12.74	5.06	15.74	5.19	13.89	5.23	13.39	5.79
Scale 1 (Hs)	7.07	5.30	8.59	6.22	7.67	4.78	10.87	7.22
Scale 2 (D)	23.89	5.27	23.07	7.68	23.35	6.00	24.93	8.42
Scale 3 (Hy)	22.74	6.59	23.74	6.75	22.76	6.11	25.91	7.12
Scale 4 (Pd)	21.41	5.56	22.63	6.10	21.93	5.48	21.30	6.20
Scale 5 (Mf)	24.00	3.05	25.85	4.33	25.54	4.57	26.43	5.10
Scale 6 (Pa)	11.89	4.54	13.96	6.07	11.11	2.83	13.15	4.40
Scale 7 (Pt)	15.63	7.99	15.33	10.65	16.13	7.36	18.78	11.79
Scale 8 (Sc)	15.67	11.30	22.48	15.83	14.52	8.73	22.17	15.66
Scale 9 (Ma)	19.89	4.41	21.48	5.76	19.80	4.57	20.83	5.47
Scale 0 (Si)	28.92	8.87	26.30	9.45	27.52	11.23	30.39	9.64

Note: Non-K-corrected raw score values were used.

Table 7

Partial Correlations Between the MAC and Various Behavioral Measures for Black and White Patients

Behavioral Correlates	Black Patients (N=54) zero order	Black Patients (N=54) control	White Patients (N=92) zero order	White Patients (N=92) control
Agitation	.15	.07	.07	.07
Ambivalence	-.14	-.18	-.24*	-.21*
Anxiety/Tension	-.02	-.03	.16	.17
Concentration Diff.	-.02	.03	-.11	-.16
Defensiveness	.16	.22	.07	.10
Depression	-.02	-.01	-.14	-.07
Disturbed Thought	-.01	-.02	-.23*	-.19
Excitability	-.30*	-.28*	.09	.06
Hallucinations	.15	.11	-.13	-.11
Hostile/Angry	.16	.15	.04	.01
Impulsivity	.12	.15	.11	.16
Inappropriate Affect	.02	.02	-.03	-.02
Inferiority	-.20	-.17	.11	.11
Memory Problems	-.22	-.29*	.07	.03
Physical Aggression	.19	.18	.10	.08
Poor Judgement	-.11	-.16	-.13	-.09
Somatic Complaints	-.01	-.04	-.22*	-.25*
Suicidal Ideation	-.04	-.03	-.29**	-.28**
Suspiciousness	-.21	-.19	.14	.16
Talkative	-.24	-.20	.21*	.20
Withdrawn	.03	.08	-.21*	-.14

Note: Zero order correlation is correlation between MAC and behavioral correlate without age controlled for. Controlled correlation is correlation between MAC and behavioral correlate with age controlled for.

* $p < .05$
** $p < .01$

Table 8

Partial Correlations Between the MAC and Various Personality Measures for Black and White Patients

	Black Patients (N=54)		White Patients (N=92)	
Personality Correlates	zero order	control	zero order	control
Standard MMPI Scales				
L	-.29	-.36	-.31**	-.33**
F	-.15	-.16	.13	.16
K	-.20	-.25	-.23*	-.26*
Scale 1 (Hs)	-.23	-.25	-.03	-.05
Scale 2 (D)	-.37**	-.35**	-.27**	-.29**
Scale 3 (Hy)	-.43**	-.45***	-.31**	-.35***
Scale 4 (Pd)	-.04	-.07	.28**	.26*
Scale 5 (Mf)	-.09	-.08	-.16	-.15
Scale 6 (Pa)	-.32*	-.32*	-.17	-.16
Scale 7 (Pt)	-.06	-.01	.04	.06
Scale 8 (Sc)	-.10	-.07	.10	.12
Scale 9 (Ma)	.22	.22	.50***	.52***
Scale 0 (Si)	-.30*	-.26	-.21*	-.18
Welsh Scales				
Anxiety (A)	.05	.10	.07	.10
Repression (R)	-.63***	-.63***	-.52***	-.52***
Wiggins Content Scales				
SOC	-.21	-.19	-.22*	-.19
DEP	-.06	-.04	.00	.02
FEM	.20	.21	-.13	-.10

Table 8 (Continued)

	Black Patients (N=54)		White Patients (N=92)	
	zero order	control	zero order	control
MOR	.02	.00	-.01	.02
REL	.02	.02	.09	.06
AUT	.45***	.48***	.52***	.54***
PSY	-.06	-.04	.10	.15
ORG	-.14	-.14	.06	.05
FAM	.04	.06	.22*	.24*
HOS	.32*	.36**	.37***	.37***
PHO	-.18	-.14	-.07	-.06
HYP	.38**	.43**	.46***	.51***
HEA	-.24	-.27	.05	.03
Special MMPI Scales				
O-H Scale	-.18	-.23	-.36***	-.37***
Do Scale	-.13	-.14	-.09	-.12
Dy Scale	.00	.04	.01	.05

Note: Zero order correlation is correlation between MAC and personality correlate without age controlled for. Controlled correlation is correlation between MAC and personality correlate with age controlled for.

* $p < .05$
** $p < .01$
*** $p < .001$

the column following the standard or zero order correlations.

In order to determine whether there were any significant racial variations on the behavioral correlates, a series of two-way analyses of variance were computed, with race (black, white) and the behavioral correlate (present, not present) as the independent variables and MAC scores as the dependent measure. A significant race x behavioral correlate interaction was hypothesized to reflect a significant racial variation. Significant interaction effects were observed on talkativeness, F (1, 142)= 5.71, $p<.05$, and excitability, F (1, 142)= 4.34, $p<.05$, while an effect which approached statistical significance was witnessed with suspiciousness, F(1, 142)= 3.79, $p=.05$. In addition to significant interactions on talkativeness and excitability, analysis of covariance, using age as the covariate, produced a statistically significant interaction effect for suspiciousness, F (1, 141)= 4.67, $p<.05$.

Supplementary Analyses

Standard MMPI Scales

Since age was found to correlate significantly with several of the standard MMPI scales (F= -.33, K= .17, Scale 4= -.21, Scale 6= -.28, Scale 7= -.24, Scale 8= -.37, Scale 9= -.33, Scale 0= -.16) multivariate analysis of covariance (MANCOVA) was used to analyze the MMPI differences between alcoholics and nonalcoholics in the black and white conditions. Since there were no significant racial differences on age

(main effect or simple main effects), multivariate analysis of variance (MANOVA) was used to contrast blacks and whites in the alcoholic and nonalcoholic conditions. The MANOVA procedure used in the Statistical Analysis System (SAS: Barr, Goodnight, Sall, & Helwig, 1976) provided an F statistic based on the Pillai-Bartlett Trace (V: Bartlett, 1939; Pillai, 1955). Means and standard deviations of non-K-corrected raw MMPI scale scores for each of the four race x abuse status groups can be found in Table 6.

There were no significant differences noted between black and white alcoholics on any single MMPI scale, nor was the MANOVA statistic, F (13, 58)= 1.54, $p>.10$, significant. In the white sample, alcoholics achieved significantly lower scores than nonalcoholics on the following MMPI scales: F, F (1, 90)= 10.83, $p<.01$; 1 (Hypochondriasis), F (1, 90)= 7.28, $p<.01$; 3 (Hysteria), F (1, 90)= 6.03, $p<.05$; 6 (Paranoia), F (1, 90)= 7.30, $p<.01$; and 8 (Schizophrenia), F (1, 90)= 10.04, $p<.01$. The MANOVA statistic, F (13, 77)= 3.09, $p<.001$, indicated that these two groups were significantly different on the MMPI. Black alcoholics, on the other hand, earned significantly lower scores than black nonalcoholics on the three MMPI validity scales, L, F (1,52)= 16.39, $p<.001$; F, F (1,52)= 4.07, $p<.05$; and K, F (1,52)= 6.18, $p<.05$. Black alcoholics and nonalcoholics were also found to differ significantly on the overall MMPI, F (13, 39)= 4.03, $p<.001$.

High-Point Pairs

The frequency of various high-point pairs was calculated for each of the race x abuse status conditions. The two most highly elevated MMPI scales (K-corrected, T-score≥65) were employed as the high-point pair. Table 9 lists the more popular (achieved by at least 5% of the entire sample) high-point pairs found in patients in the present investigation. There were no significant alcoholic-nonalcoholic high-point pair differences in the black sample. In the white sample, the 2-4/4-2 high-point pair was observed more frequently in alcoholics than in nonalcoholics. White alcoholics also produced significantly fewer "low frequency" (achieved by less than 5% of entire sample) high-point pairs compared with their nonalcoholic counterparts. The mean profile configuration for both black and white alcoholics, on the other hand, demonstrated a peak on Scale 4 (Psychopathic Deviate) and a secindary peak on Scale 2 (Depression). This 4-2 pattern was found regardless of whether K-corrected or non-K-corrected T-scores were used.

The MMPI literature on alcoholism suggests that Scale 4 is often the most highly elevated MMPI scale in alcoholics (see Clopton, 1978). Therefore, the percentage of high-point pairs containing Scale 4 were compared across abuse status conditions for black and white patients. The percentage of high-point pairs containing Scale 4 did not differ between black alcoholics (33.3%) and nonalcoholics (33.3%), $\chi^2(1) = .00$, $p > .10$. White alcoholics, on the other hand, achieved significantly more high-point pairs containing Scale 4 (56.5%)

Table 9

Frequency of High-Point Pairs for Groups of Black and White Alcoholic and Nonalcoholic Inpatients

High-Point Pair	Blacks			Whites		
	Alcoholic (N=27)	Nonalcoholic (N=27)	χ^2	Alcoholic (N=46)	Nonalcoholic (N=46)	χ^2
2-4/4-2	11.1%	11.1%	.00	17.4%	2.2%	6.03*
2-7/7-2	3.7%	3.7%	.00	8.7%	4.3%	.71
2-8/8-2	3.7%	0.0%	1.02	6.5%	6.5%	.00
4-8/8-4	3.7%	7.4%	.35	4.3%	6.5%	.21
4-9/9-4	11.1%	11.1%	.00	21.7%	15.2%	.65
8-9/9-8	7.4%	25.9%	3.34	4.3%	10.9%	1.39
K+[1]	7.4%	14.8%	.75	6.5%	10.9%	.55
Other	40.7%	22.2%	2.15	23.9%	43.5%	3.94*
None[2]	11.1%	3.7%	1.08	6.5%	0.0%	3.10

[1] determined on the basis of criteria established by Marks et al. (1974).

[2] there was no scale $\geq$ 65 and it did not fit criteria for K+.

* $p < .05$

than did their nonalcoholic counterparts (28.3%), $\chi^2(1) = 7.52$, $p < .01$. The differences between black and white alcoholics on this variable approached statistical significance, $\chi^2(1) = 3.64$, $p = .06$.

CHAPTER IV
DISCUSSION

The present results indicate that groups of black and white alcoholic inpatients produced similar mean scores on the MAC (Hypothesis 1). The power achieved by the MAC in this study (.94) suggests that one can be relatively confident in the results. In the present investigation black alcoholics achieved MAC scores (M= 26.92) which did not differ significantly from the scores attained by white alcoholics (M= 27.63). This result is consistent with past studies which failed to find any differences on the MAC between alcoholics (Uecker et al., 1980) or drug abusers (Lachar et al., 1976) of different racial backgrounds. Thus, it would appear that black and white alcoholics perform similarly on the MAC, at least in terms of group mean scores.

The second hypothesis, that the MAC would be capable of discriminating between alcoholics and nonalcoholics in samples of black and white inpatients, received partial support. While the MAC successfully discriminated between alcoholic and nonalcoholic whites (66.3%), it was unable to do so in the black sample (55.5%). The ability of the MAC to accurately classify white alcoholics and nonalcoholics is consistent with previous research results (Apfeldorf & Hunley, 1975; Clopton et al., 1980; Conley & Kammeier, 1980; DeGroot & Adamson, 1973; Hoffman et al., 1974; MacAndrew, 1965, 1979c; Rhodes, 1969; Rhodes & Chang, 1978; Rich & Davis,

1969; Uecker, 1970; Vega, 1971). The present study was an initial attempt at evaluating the discriminative power of the MAC in nonwhite subjects, and the present results suggest that the MAC may not be as useful with blacks as it is with whites.

There is also little empirical basis for rejecting the hypothesis that black and white inpatients would demonstrate similar behavioral/personality correlational patterns with the MAC (Hypothesis 3). The results of the present investigation indicate that the MAC is correlated with various MMPI scales reflecting nondefensiveness, impulsivity, high energy level, authority conflict, and significant amounts of anger and hostility. This relationship was found with both black and white patients. While several black-white differences were noted the similarities appear to outweigh the differences, both in terms of the behavioral as well as the personality correlates.

One might argue that the nonalcoholic psychiatric inpatients used in the present study were an inappropriate comparison group for the alcoholic inpatients since the two groups were sampled from two different hospitals. Three points should be kept in mind in responding to this criticism. First, it was assumed that psychiatric inpatients in both Army facilities (i.e., William Beaumont Army Medical Center, Dwight D. Eisenhower Army Medical Center) were comparable since both are part of the same system, namely active duty

military personnel. Second, direct comparisons between psychiatric inpatients hospitalized at Dwight Eisenhower Army Medical Center and William Beaumont Army Medical Center revealed no significant differences on a number of demographic variables (e.g., age, education, marital status). Third, while alcoholic/nonalcoholic comparisons are important, the focus of the present study was on contrasting black and white patients in terms of the discriminative power of the MAC.

The results of several supplementary analyses revealed that black and white alcoholics do not differ sognificantly on the standard MMPI scales. However, both black and white alcoholics tend to score significantly different from their nonalcoholic counterparts on the MMPI. White alcoholics were found to record significantly lower scores on MMPI Scales F, 1 (Hypochondriasis), 3 (Hysteria), 6 (Paranoia), and 8 (Schizophrenia) relative to white nonalcoholics. Black alcoholics, on the other hand, achieved significantly lower scores than black nonalcoholics on the three MMPI validity scales: L, F, and K. In the white sample, alcoholics tended to produce less elevated MMPI profiles relative to non-alcoholic psychiatric inpatients. Black alcoholic inpatients, on the other hand, exhibited a tendency to be less defensive and less prone to psychological distress when compared with black nonalcoholic inpatients.

Previous investigations have documented the

relatively high rate of 2-4/4-2 high-point pairs in alcoholic samples (see Clopton, 1978). In the present study the mean MMPI profile achieved by both black and white alcoholics was the 4-2 high-point pair. However, only white alcoholics achieved significantly more 2-4/4-2 high-point pairs relative to their nonalcoholic controls. Moreover, in comparison to nonalcoholic controls, only white alcoholics produced significantly more high-point pairs containing Scale 4 (Psychopathic Deviate). Both of these findings are consistent with the MAC results which suggest that the MMPI is more capable of making alcoholic-nonalcoholic discriminations in samples of white subjects than it is in samples of black subjects. It is also noteworthy that while white alcoholics achieved significantly more Scale 4 high-point pairs, their mean score on Scale 4 did not differ from that found in nonalcoholic whites. This finding appears to reflect the tendency of white alcoholics to produce less elevated MMPI profiles, but with Scale 4 characteristically being one of the more highly elevated scales in the alcoholic profile.

Past research investigating the relationship between race and alcoholism on either the MMPI (Epstein, 1970; Hugo, 1970; Ludmar, 1979; Patterson et al., 1981) or MAC (Uecker et al., 1980) has concentrated upon racial comparisons involving alcoholics only. However, as the results of the present study suggest, it may be more meaningful to compare racial groups in terms of how successfully the MMPI or MAC

discriminates between alcoholics and nonalcoholics. Previous studies have neglected these types of comparisons and so the implications of their results tend to be limited. Thus, if the discriminative power of the MAC is to be properly evaluated, separate alcoholic-nonalcoholic comparisons need to be made for black and white inpatients, as was done in the present study.

The apparent inability of the MAC to discriminate between black alcoholics and nonalcoholics appeared to be a function of the relatively high MAC scores earned by nonalcoholic blacks. Further analysis revealed that no significant demographic differences were found between black and white nonalcoholic inpatients except on diagnosis. While more white nonalcoholics were diagnosed as neurotic and more black nonalcoholics as schizophrenic or schizophreniform, only neurotic diagnoses correlated significantly with MAC scores, $r_{pb(71)} = -.32$, $p < .01$. However, it is uncertain how much of the variance between black and white nonalcoholics is attributable to the limited number of neurotic diagnoses in the black nonalcoholic condition since only a minority of nonalcoholic whites were diagnosed as neurotic (39%).

The inverse relationship observed between neurosis and the MAC suggests that individuals with neurotic types of conflicts may score somewhat lower on the MAC. As was already mentioned, the research literature on alcoholism and the MMPI demonstrates that alcoholic MMPIs tend to

organize themselves into two global clusters: neurotic and psychopathic (Brown, 1950; Button, 1956; Donovan et al., 1978; Eshbaugh et al., 1978; Mogar et al., 1970). It is possible that MMPI-defined neurotics constitute a majority of the MAC false negatives, since they may tend to score lower on this scale relative to psychopathic alcoholics. This possibility was explored empirically using the present data and the following equation (K-corrected T-scores were used): (Scale 2 + Scale 7) - (Scale 4 + Scale 9). Positive scores were assigned to the neurotic alcoholic group (N=30) and negative scores were assigned to the psychopathic alcoholic group (N=42). One alcoholic achieved a score of 0, and his MMPI protocol was eliminated for the purposes of this data analysis. An analysis of variance procedure revealed that the MMPI-defined psychopathic alcoholics achieved significantly higher scores on the MAC (M=28.6) relative to the MMPI-defined neurotic alcoholics (M=26.5), $F\ (1, 70) = 14.29$, $p < .001$. Furthermore, 75% of the false negatives in the present investigation were classified by the MMPI into the neurotic alcoholic group. The greater number of false negatives in the neurotic group compared to the psychopathic group was found to be statistically significant, $\chi^2(1) = 6.43$, $p < .05$. It is possible, therefore, that alcoholics displaying neurotic types of conflicts may, in fact, constitute the majority of false negatives on the MAC. Nevertheless, further research is necessary.

A second possible explanation for why black non-

alcoholics achieved such high MAC scores is that blacks may be less likely than whites to report drug and alcohol misuse. It is speculated that if blacks are less likely than whites to report substance abuse, significantly more black than white "nonalcoholics" may be using drugs or alcohol surreptitiously. As a result, the MAC would be correctly identifying them as potential substance abusers, although in the current design they would be classified as false positives.

The aforementioned argument raises the issue of whether the absence of a significant drug or alcohol history, as recorded in the patient's clinical chart, is sufficient to rule out the presence of substance misuse. This argument may also explain why the false positive rate was so much higher than the rate of false negatives in the present investigation. That is, in a study such as the present one it is easier to establish a diagnosis of alcohol abuse (e.g., patient enrolled in an alcohol treatment program) than it is to rule such a diagnosis out. One could argue, therefore, that a significant number of nonalcoholic controls were in fact abusing alcohol or drugs but that their clinical charts failed to reflect this fact. While this is certainly a valid argument, it fails to explain the significant differences observed in the rate of false positives for black (37%) and white (25%) nonalcoholic inpatients.

One possible explanation for the discrepancy between black and white nonalcoholics in terms of the rate of false

positives may be that black nonalcoholics are less distressed by a moderate level of drug or alcohol abuse and so are less likely to report such abuse. This hypothesis suffers from an empirical standpoint since such attitudinal differences toward substance misuse are typically associated with black-white differences in socioeconomic status and educational/occupational opportunities (cf. Bourne & Light, 1979). However, the black and white nonalcoholic psychiatric inpatients studied in the present investigation were found not to differ significantly in terms of either education or military rank.

Another possibility for the differential false positive rate observed between black and white nonalcoholics is that black nonalcoholics are more defensive and so less likely to report alcohol and drug problems. This hypothesis is supported somewhat by the finding that black nonalcoholics achieved higher scores than white nonalcoholics on the two MMPI scales (i.e., L and K) thought to reflect defensiveness, although only the difference on Scale L was statistically significant. Conversely, there were no significant differences noted between black and white nonalcoholics on the behavioral correlate "defensiveness," $\chi^2(1) = .01$, $p > .10$. Thus, the evidence for the "defensiveness" hypothesis is mixed at best. The reasoning behind this hypothesis is somewhat strained and the parameters difficult to verify given the present data; it may nonetheless be an interesting possibility to explore

empirically.

A third explanation of why the MAC was unable to discriminate between black alcoholics and nonalcoholics takes into account the influence of moderator variables (cf. Pritchard & Rosenblatt, 1980). The present study found no significant black-white differences on education or military rank in the nonalcoholic group. Furthermore, both variables were uncorrelated with the MAC in the overall sample and neither military rank, r (52)= -.25, p= .07, nor education, r (52)= -.02, $p > .10$, were significantly correlated with the MAC in the black sample only. The present results, however, did indicate that younger black males, regardless of whether or not they were alcoholic, tended to achieve higher scores on the MAC; whereas in the white sample, age and MAC scores were positively correlated. This differential relationship between age and the MAC may help explain the MAC's apparent inability to discriminate between alcoholic and nonalcoholic blacks. The nature and clinical significance of this interaction, however, is unclear and deserves further investigation.

Previous research has produced conflicting results concerning the relationship between age and the MAC. For instance, Apfeldorf and Hunley (1975) reported a negative relationship between age and the MAC, whereas Friedrich and Loftsgard (1978) found a positive relationship. It is speculated that differential subject characteristics contributed to these divergent findings. That is, Friedrich and Loftsgard (1978) conducted their study using a

sample of "Driving While Intoxicated" (DWI) offenders, whereas Apfeldorf and Hunley (1975) employed domiciled alcohol abusers with a chronic history of alcohol-related problems. Thus, the present investigation, when considered along side these two earlier studies, suggests that the MAC may be differentially correlated with age depending upon a variety of subject characteristics (e.g., race, chronicity of alcohol abuse). Clarification of which subject and treatment variables tend to modify the relationship between age and the MAC appears to be a potentially fruitful avenue for future research.

The behavioral data suggest that in whites the MAC is directly correlated with talkativeness and social ease and inversely correlated with a variety of schizotypal (ambivalence, disturbed thought, hallucinations, withdrawal) and neurotic (depression, somatic complaints, suicidal ideation) traits. These correlates are similar to the ones observed by Lachar et al. (1976) in a sample of general psychiatric patients. Lachar et al. (1976) discovered that withdrawal, ambivalence, and depression were all negatively correlated with the MAC. However, they also found talkativeness to be negatively correlated with the MAC, a finding which conflicts with the positive correlation observed in the present study.

In the black sample the MAC was found to correlate negatively with excitability, memory problems, suspiciousness, and talkativeness. Defensiveness, hostility, and physical aggression were all found to correlate directly (although at a

nonsignificant level) with the MAC in black patients. Further analysis revealed that significant racial differences were present on three of these behavioral measures: excitability, suspiciousness, and talkativeness. These black-white differences suggest that the MAC may be tapping ease in social situations with white patients, whereas in blacks the MAC may be measuring the tendency to be less suspicious, but also less responsive to interpersonal situations. Therefore, a high score on the MAC may reflect more or less suspiciousness, excitability, and responsiveness to interpersonal situations, depending upon the individual's ethnic status. One must remember, however, that the present study was conducted using a sample of male short-term alcoholic and psychiatric inpatients. Future researchers may want to attempt similar studies using different patient populations (e.g., outpatients, Mexican-Americans, females).

The personality correlates (standard and special MMPI scales) of the MAC observed in the present investigation were similar to those reported by Schwartz and Graham (1979). For instance, both studies found a negative relationship between the MAC and several MMPI scales thought to reflect defensiveness (L, K, 3, Welsh R). These results also suggest that individuals with high MAC scores typically do not employ repression in dealing with psychological conflict. Authority conflict (AUT), high felt energy level (HYP, Scale 9), self-reported hostility (HOS), and the absence of Depression (Scale

2) also correlated with the MAC in both studies. The perception of family conflict (FAM), however, was only found to correlate with the MAC in the Schwartz and Graham study and in the white sample of the present investigation. Somatic and physical complaints (HEA), on the other hand, correlated with the MAC (inversely) in the black patients of the present study only.

Two important discrepancies were noted between the results of the present study and those achieved by Schwartz and Graham (1979). First, Schwartz and Graham concluded that the MAC seems to be tapping a cluster of personality characteristics reflecting general psychological maladjustment. This conclusion was not supported by the present results, however, since the Welsh A Scale, MMPI Scales 6 (Paranoia), and 8 (Schizophrenia), and the Wiggins PSY scale were either uncorrelated or negatively correlated with the MAC; this result was found with both black and white patients. Furthermore, the behavioral correlates of disturbed thought, concentration difficulties, and hallucinations (white subjects only) were found to correlate negatively with the MAC. Thus, while the first cluster of MAC personality correlates, as postulated by Schwartz and Graham (i.e., aggressive, superficial, impulsive interpersonal behavior: Schwartz & Graham, 1979), was replicated in the present study, the second cluster of MAC personality correlates (i.e., "general psychological maladjustment and problems with thinking, concentration and

possibly perception": Schwartz & Graham, 1979, p. 1094) was not. Explaining this discrepancy is difficult since subjects in both studies were hospitalized in relatively short-term inpatient facilities. Moreover, it is unlikely that these conflicting results surfaced by chance since the results are nearly diametrically opposed on the scales which seem to be measuring general psychological maladjustment (i.e., Welsh A, Scale 6, Scale 8, PSY). It may be that the racial breakdown or the use of a more homogeneous sample (i.e., active duty military) played an important role in these divergent findings.

A second discrepancy was found in terms of the relationship between the MAC and Scale 4 (Psychopathic Deviate) of the MMPI. Schwartz and Graham (1979) found very little, if any, relationship between these two scales and concluded that the MAC is not measuring general antisociality. However, in the present study Scale 4 and the MAC were moderately correlated in the white sample, although the relationship between these scales in the black sample was virtually nonexistent. Possibly, the MAC is more sensitive to a general dimension of antisociality in white patients than it is in black patients. Therefore, the lower correlation observed between the MAC and Scale 4 by Schwartz and Graham may have been a function of the fact that they used a sample containing both blacks and whites.

The current results indicate that in both black and

white patients the MAC is correlated with various MMPI scales in a manner which suggests nondefensiveness, hostility, impulsivity, high levels of energy, and an absence of depression. Apparently individuals who elevate the MAC are much less likely to utilize neurotic types of mechanisms, like repression, suppression, and internalization, in dealing with situations relative to individuals who score low on the MAC. The fact that substance abuse is often viewed as an "acting out" type of behavior further supports the contention that high scores on the MAC are associated with the tendency to externalize psychological conflict.

Even though several significant racial variations in the behavioral/personality correlates of the MAC were observed in the present study, the similarities tend to outweigh the differences. Thus, while the MAC did not seem to contrast black alcoholics and nonalcoholics as successfully as it contrasted white alcoholics and nonalcoholics, there were few significant racial differences in terms of the correlates of the MAC.

The primary reason for conducting the present investigation was to determine whether black-white differences exist on the MAC scale of the MMPI. The current data indicate that while black and white alcoholics do not differ significantly on the MAC (both in terms of group mean MAC scores and accurate identification of patients using cutting scores), the MAC discriminated between alcoholics and nonalcoholics only in the

group of white patients. The inability of the MAC to discriminate between black alcoholics and nonalcoholics appears to be a result of the high scores achieved by black nonalcoholics, which suggests that the MAC may not be as useful in detecting substance abuse in blacks as it is in whites. This finding tends to support the contentions of Gynther and his colleagues (Gynther, 1972; Gynther & Green, 1980) that significant racial variations exist on the MMPI, in this case on a special MMPI scale, the MAC. It is concluded, therefore, that clinically significant black-white differences were observed on the MAC. Nevertheless, further research is necessary in order to document, evaluate, and explore this effect and its generalizability.

REFERENCE NOTES

1. Fowler, R. A method for the evaluation of the abuse prone patient. Scientific exhibit at the American Academy of Family Physicians, Chicago, 1975.

2. Marks, P.A., Bertelson, A., & May, G. Race and MMPI: Some new findings and considerations. Paper presented at the 85th annual convention of the American Psychological Association, San Francisco, 1977.

REFERENCES

American Psychiatric Association. Diagnostic and statistical manual (3rd ed.). Washington, D.C., APA, 1980.

Apfeldorf, M., & Hunley, P.J. Application of MMPI alcoholism scales to older alcoholics and problem drinkers. Journal of Studies on Alcohol, 1975, 36, 645-653.

Apfeldorf, M., & Hunley, P.J. Exclusion of subjects with F scores at or above 16 in MMPI research on alcoholism. Journal of Clinical Psychology, 1976, 32, 498-500.

Atsaides, J.P., Neuringer, C., & Davis, K.L. Development of an institutionalized chronic alcoholic scale. Journal of Consulting and Clinical Psychology, 1977, 45, 609-611.

Ball, J.C. Comparison of MMPI profile differences among Negro-white adolescents. Journal of Clinical Psychology, 1960, 16, 304-307.

Ball, J.C. Social deviancy and adolescent psychology. Lexington, Kentucky: University of Kentucky Press, 1962.

Barr, A.J., Goodnight, J.H., Sall, J.P., & Helwig, J.T. A user's guide to SAS-76. Raleigh, N.C.: Sparks Press, 1976.

Bartlett, M.S. A note on significance in multivariate

analysis. Proceedings of the Cambridge Philosophical Society, 1939, 35, 180-185.

Bartz, W.R., & Loy, D.L. The Shipley Hartford as a brief IQ screening device. Journal of Clinical Psychology, 1970, 26, 74-75.

Baughman, E.E., & Dahlstrom, W.G. Negro and white children: A psychological study in the rural south. New York: Academic Press, 1968.

Bourne, P.G., & Light, E. Alcohol problems in blacks and women. In J.H. Mendelson & N.K. Mello (Eds.). The diagnosis and treatment of alcoholism. New York: McGraw-Hill, 1979.

Brown, M.A. Alcoholic profiles on the Minnesota Multiphasic. Journal of Clinical Psychology, 1950, 6, 266-269.

Brozek, J. Personality change with age: An item analysis of the MMPI. Journal of Gerontology, 1955, 10, 194-206.

Burke, H., & Marcus, R. MacAndrew MMPI alcoholism scale: Alcoholism and drug addictiveness. Journal of Psychology, 1977, 96, 141-148.

Butcher, J.N., Ball, B., & Ray, E. Effects of socioeconomic level on MMPI differences in Negro-white college students. Journal of Counseling Psychology, 1964, 11, 83-87.

Butcher, J.N., & Owen, P.L. Objective personality inventories: Recent research and some contemporary issues. In B.B. Wolman (Ed.), Clinical diagnosis of mental disorders: A handbook. New York: Plenum, 1978.

Butcher, J.N., & Tellegen, A. Common methodological problems in MMPI research. Journal of Consulting and Clinical Psychology, 1978, 46, 620-628.

Button, A.D. A study of alcoholics with the MMPI. Quarterly Journal of Studies on Alcohol, 1956, 17, 263-281.

Claiborn, J.E., & Greene, R.L. Neuropsychological changes in recovering alcoholics. Journal of Studies on Alcohol, 1981, in press.

Chang, A., Caldwell, A.B., & Moss, T. Stability in personality traits in alcoholics during and after treatment as measured by the MMPI: A one-year follow-up study. Proceedings of the 81st Annual Convention of the American Psychological Association, 1973, 8, 387-388.

Clark, C.G., & Miller, H.L. Validation of Gilberstadt and Duker's 8-6 profile type on a black sample. Psychological Reports, 1971, 29, 259-264.

Clopton, J.R. Alcoholism and the MMPI: A review. Journal of Studies on Alcohol, 1978, 39, 1540-1558.

Clopton, J.R., & Klein, G.L. An initial look at the re-

dundancy of specialized MMPI scales. Journal of Consulting and Clinical Psychology, 1978, 46, 1436-1438.

Clopton, J.R., & Neuringer, C. MMPI Cannot Say scores: Normative data and degree of profile distortion. Journal of Personality Assessment, 1977, 41, 511-513.

Clopton, J.R., Weiner, R.H., & Davis, H.G. Use of the MMPI in identification of alcoholic psychiatric patients. Journal of Consulting and Clinical Psychology, 1980, 48, 416-417.

Cohen, J. Statistical power analysis for the behavioral sciences. New York: Academic Press, 1969.

Colligan, R.C., & Osborne, D. MMPI profiles from adolescent medical patients. Journal of Clinical Psychology, 1977, 33, 186-189.

Conley, J.J., & Kammeier, M.L. MMPI item responses of alcoholics in treatment: Comparisons with normals and psychiatric patients. Journal of Consulting and Clinical Psychology, 1980, 48, 668-669.

Cooke, G., Pogany, E., & Johnston, N.G. A comparison of blacks and whites committed for evaluation of competency to stand trial on criminal charges. Journal of Psychiatry and the Law, 1974, 2, 319-337.

Costello, R.M. Item level racial differences on the MMPI.

Journal of Social Psychology, 1973, 91, 161-162.

Costello, R.M., Fine, H.J., & Blau, B.I. Racial comparisons on the MMPI. Journal of Clinical Psychology, 1973, 29, 63-65.

Costello, R.M., Tiffany, D.W., & Gier, R.H. Methodological issues and racial (black-white) comparisons on the MMPI. Journal of Consulting and Clinical Psychology, 1972, 38, 161-168.

Cowan, M.A., Watkins, B.A., & Davis, W.E. Level of education, diagnosis and race-related differences in MMPI performance. Journal of Clinical Psychology, 1975, 31, 442-444.

Cronbach, L.J. Essentials of psychological testing (3rd ed.). New York: Harper & Row, 1970.

Curlee, J. A comparison of male and female patients at an alcoholism treatment center. Journal of Pyschology, 1970, 74, 239-247.

Dahlstrom, W.G., Welsh, G.S., & Dahlstrom, L.E. An MMPI handbook: Vol. I., Clinical interpretation (Rev. ed.). Minneapolis: University of Minnesota Press, 1972.

Davis, W.E. Race and the differential "power" of the MMPI. Journal of Personality Assessment, 1975, 39, 138-140.

Davis, W.E., Beck, S.J., & Ryan, T.A. Race-related and

educationally-related MMPI profile differences among hospitalized schizophrenics. Journal of Clinical Psychology, 1973, 29, 478-479.

Davis, W.E., & Jones, M.H. Negro versus Caucasian psychological test performance revisited. Journal of Consulting and Clinical Psychology, 1974, 42, 675-679.

DeGroot, G.W., & Adamson, J.D. Responses of psychiatric inpatients to the MacAndrew alcoholism scale. Quarterly Journal of Studies on Alcohol, 1973, 34, 1133-1139.

Donovan, D.M., Chaney, E.F., & O'Leary, M.R. Alcoholic MMPI subtypes: Relationship to drinking styles, benefits, and consequences. Journal of Nervous and Mental Disease, 1978, 166, 553-561.

Elion, V.H., & Megargee, E.I. Validity of the MMPI Pd scale among black males. Journal of Consulting and Clinical Psychology, 1975, 43, 166-172.

English, G.E., & Curtin, M.E. Personality differences in patients at three alcoholism treatment agencies. Journal of Studies on Alcohol, 1975, 36, 52-61.

Epstein, P.B. Personality characteristics of skid row Negro and white chronic alcoholics as identified by the MMPI. Unpublished master's thesis, George Washington University, 1970.

Erdberg, S.P. MMPI differences associated with sex, race, and residence in a southern sample (Doctoral dissertation, University of Alabama, 1969). Dissertation Abstracts International, 1970, 30, 523B. (University Microfilms No. 70-9343)

Eshbaugh, D.M., Tosi, D.J., & Hoyt, C. Some personality patterns and dimensions of male alcoholics: A multivariate description. Journal of Personality Assessment, 1978, 42, 409-417.

Eshbaugh, D.M., Tosi, D.J., & Hoyt, C.N. Women alcoholics: A typological description using the MMPI. Journal of Studies on Alcohol, 1980, 41, 310-317.

Finney, J.C., Smith, D.F., Skeeters, D.K., & Auvenshine, C.D. MMPI alcoholism scales: Factor structure and content analysis. Quarterly Journal of Studies on Alcohol, 1971, 32, 1055-1060.

Flanagan, J.C., & Lewis, G. Comparison of Negro and white lower class men on the general aptitude test battery and the MMPI. Journal of Social Psychology, 1969, 78, 289-291.

Friedrich, W.N., & Loftsgard, S.O. A comparison of the MacAndrew alcoholism scale and Michigan alcoholism screening test in a sample of problem drinkers. Journal of Studies on Alcohol, 1978, 39, 1940-1944.

Fry, P.D. A study of the personality traits of college students and of state prison inmates as measured by the MMPI. Journal of Psychology, 1949, 28, 439-449.

Genthner, R.W., & Graham, J.R. Effects of short-term public psychiatric hospitalization for both black and white patients. Journal of Consulting and Clinical Psychology, 1976, 44, 118-124.

Gilberstadt, H., & Duker, J. A handbook for clinical and actuarial MMPI interpretation. Philadelphia: Saunders, 1965.

Goldstein, S.G., & Linden, J.D. Multivariate classification of alcoholics by means of the MMPI. Journal of Abnormal Psychology, 1969, 74, 661-669.

Gough, H.G., McClosky, H., & Meehl, P.E. A personality scale for dominance. Journal of Abnormal and Social Psychology, 1951, 46, 360-366.

Graham, J.R., & Schwartz, M.F. Methodological issues and the construct validity of the MacAndrew Alcoholism Scale: A response to rebuttal and constructive comments of Merenda and Sparadeo. Journal of Consulting and Clinical Psychology, 1981, 49, 971-973.

Grayson, H. Psychological admissions testing program and manual. Los Angeles: Veterans Administration Center, 1951.

Greene, R.L. The MMPI: An interpretive manual. New York: Grune & Stratton, 1980.

Gynther, M.D. White norms and black MMPIs: A prescription for discrimination? Psychological Bulletin, 1972, 78, 386-402.

Gynther, M.D., Altman, H., & Warbin, R.W. Behavioral correlates for the MMPI 4-9/9-4 code types: A case of the emperor's new clothes? Journal of Consulting and Clinical Psychology, 1973, 40, 259-263.

Gynther, M.D., Fowler, R.D., & Erdberg, P. False positives galore: The application of standard MMPI criteria to a rural, isolated, Negro sample. Journal of Clinical Psychology, 1971, 27, 234-237.

Gynther, M.D, & Green, S.B. Accuracy may make a difference, but does a difference make for accuracy?: A response to Pritchard and Rosenblatt. Journal of Consulting and Clinical Psychology, 1980, 48, 268-272.

Hampton, P.J. The development of a questionnaire for drinkers. Genetic Psychology Monographs, 1953, 48, 55-115.

Harrison, R.H., & Kass, E.H. Differences between Negro and white pregnant women on the MMPI. Journal of Consulting Psychology, 1967, 31, 454-463.

Harrison, R.H., & Kass, E.H. MMPI correlates of Negro acculturation in a northern city. Journal of Personality and Social Psychology, 1968, 10, 262-270.

Hathaway, S.R., & Mckinley, J.C. A multiphasic personality schedule (Minnesota): I. Construction of the schedule. Journal of Psychology, 1940, 10, 249-254.

Hathaway, S.R., & Meehl, P.E. An atlas for the clinical use of the MMPI. Minneapolis: University of Minnesota Press, 1951.

Hewitt, C.C. A personality study of alcohol addiction. Quarterly Journal of Studies on Alcohol, 1943, 4, 368-386.

Hill, H.E., Haertzen, C.A., & Glaser, R. Personality characteristics of narcotic addicts as indicated by the MMPI. Journal of General Psychology, 1960, 62, 127-139.

Hodo, G.L., & Fowler, R.D. Frequency of MMPI two-point codes in a large alcoholic sample. Journal of Clinical Psychology, 1976, 32, 487-489.

Hoffmann, H., Jansen, D.G., & Wefring, L.R. Relationships between admission variables and MMPI scale scores of hospitalized alcoholics. Psychological Reports, 1972, 31, 659-662.

Hoffmann, H., Loper, R.G., & Kammeier, M.L. Identifying future alcoholics with MMPI alcoholism scales. Quarterly Journal of Studies on Alcohol, 1974, 35, 490-498.

Hoffmann, H., & Nelson, P.C. Personality characteristics of alcoholics in relation to age and intelligence. Psychological Reports, 1971, 29, 143-149.

Hokanson, J.E., & Calden, G. Negro-white differences on the MMPI. Journal of Clinical Psychology, 1960, 16, 32-33.

Holland, T.R. Ethnic group differences in MMPI profile pattern and factorial structure among adult offenders. Journal of Personality Assessment, 1979, 43, 72-77.

Hoyt, D.P., & Sedlacek, G.M. Differentiating alcoholics from normals and abnormals with the MMPI. Journal of Clinical Psychology, 1958, 14, 69-74.

Huber, N.A., & Danahy, S. Use of the MMPI in predicting completion and evaluating change in a long-term alcoholism treatment program. Journal of Studies on Alcohol, 1975, 36, 1230-1237.

Hugo, J.A. II. A comparison of Negro and white outpatient alcoholics on the Minnesota Multiphasic Personality Inventory. Unpublished master's thesis, Alabama University, 1970.

Jansen, D.G., & Hoffmann, H. Demographic and MMPI characteristics of male and female state hospital alcoholic patients. Psychological Reports, 1973, 33, 561-562.

Jones, E.E. Black-white differences: Another look. Journal of Personality Assessment, 1978, 42, 244-252.

Kammeier, M.L., Hoffmann, H., & Loper, R.G. Personality characteristics of alcoholics as college freshmen and at time of treatment. Quarterly Journal of Studies on Alcohol, 1973, 34, 390-399.

Keppel, G. Design and analysis: A researcher's handbook. Englewood Cliffs, N.J.: Prentice-Hall, 1973.

King, H.F., Carroll, J.L., & Fuller, G.B. Comparison of nonpsychiatric blacks and whites on the MMPI. Journal of Clinical Psychology, 1977, 33, 725-728.

Klinge, V., & Strauss, M. Effects of scoring norms on adolescent psychiatric patient's MMPI profiles. Journal of Personality Assessment, 1976, 40, 13-17.

Kranitz, L. Alcoholics, herion addicts, and nonaddicts: Comparisons on the MacAndrew alcoholism scale of the MMPI. Quarterly Journal of Studies on Alcohol, 1972, 33, 807-809.

Lachar, D., Berman, W., Grisell, J.L., & Schooff, K. The MacAndrew alcoholism scale as a measure of substance abuse. Journal of Studies on Alcohol, 1976, 37, 1609-1615.

Lanyon, R.I., Primo, R.V., Terrell, R., & Wener, A. An aversion-desensitization treatment for alcoholism. Journal of Consulting and Clinical Psychology, 1972, 38, 394-398.

Leon, G.R., Gillum, B., Gillum, R., & Gouze, M. Personality stability and change over a 30-year period--middle age to old age. Journal of Consulting and Clinical Psychology, 1979, 47, 517-524.

Libb, V.W., & Taulbee, E.S. Psychotic-appearing MMPI profiles among alcoholics. Journal of Clinical Psychology, 1971, 27, 101-102.

Linn, R.L. Single-group validity, differential validity, and differential prediction. Journal of Applied Psychology, 1978, 63, 507-512.

Lisansky, E.S. Clinical research in alcoholism and the use of psychological tests: A reevaluation. In R. Fox (Ed.), Alcoholism: Behavioral research, therapeutic

approaches. New York: Springer, 1967.

Loper, R.G., Kammeier, M.L., & Hoffmann, H. MMPI characteristics of college freshmen males who later became alcoholics. Journal of Abnormal Psychology, 1973, 82, 159-162.

Ludmar, J.M. Selected personality characteristics of black and white male alcoholics in a state treatment facility (Doctoral dissertation, Fordham University, 1978) Dissertation Abstracts International, 1979, 39, 1459B. (Microfilms No. 78-16, 593)

MacAndrew, C. The differentiation of male alcoholic outpatients from nonalcoholic psychiatric outpatients by means of the MMPI. Quarterly Journal of Studies on Alcohol, 1965, 26, 238-246.

MacAndrew, C. Self-reports of male alcoholics: A dimensional analysis of certain differences from nonalcoholic male psychiatric outpatients. Quarterly Journal of Studies on Alcohol, 1967, 28, 43-51.

MacAndrew, C. Evidence for the presence of two fundamentally different, age-independent characterological types within unselected runs of male alcohol and drug abusers. American Journal of Drug and Alcohol Abuse, 1979, 6, 207-221. (a)

MacAndrew, C. MAC scores of three samples of men under conditions of conventional versus independent scale

administration. Journal of Studies on Alcohol, 1979, 40, 138-141. (b)

MacAndrew, C. On the possibility of the psychometric detection of persons who are prone to the abuse of alcohol and other substances. Addictive Behaviors, 1979, 4, 11-20. (c)

MacAndrew, C. Male alcoholics, secondary psychopathy, and Eysenck's theory of personality. Personality and Individual Differences, 1980, 1, 151-160.

MacAndrew, C. What the MAC scale tells us about men alcoholics. Journal of Studies on Alcohol, 1981, 42, 604-625.

MacAndrew, C., & Geertsma, R.H. An analysis of responses of alcoholics to Scale 4 of the MMPI. Quarterly Journal of Studies on Alcohol, 1963, 24, 23-38.

MacAndrew, C., & Geertsma, R.H. A critique of alcoholism scales derived from the MMPI. Quarterly Journal of Studies on Alcohol, 1964, 25, 68-76.

McDonald, R.L., & Gynther, M.D. MMPI norms for southern adolescent Negroes. Journal of Social Psychology, 1962 58, 277-282.

McDonald, R.L., & Gynther, M.D. MMPI differences associated with sex, race, and class in two adolescent samples. Journal of Consulting Psychology, 1963, 27, 112-116.

McGill, J.C. MMPI score differences among Anglo, black, and Mexican-American welfare recipients. Journal of Clinical Psychology, 1980, 36, 147-151.

McGinnis, C.A., & Ryan, C.W. The influence of age on MMPI scores of chronic alcoholics. Journal of Clinical Psychology, 1965, 21, 271-272.

McLachlan, J.F.C. Classification of alcoholics by an MMPI actuarial system. Journal of Clinical Psychology, 1975, 31, 145-147.

Marks, P.A., Seeman, W., & Haller, D.L. The actuarial use of the MMPI with adolescents and adults. Baltimore: Williams & Wilkins, 1974.

Meehl, P.E., & Hathaway, S.R. The K factor as a suppressor variable in the MMPI. Journal of Applied Psychology, 1946, 30, 525-564.

Megargee, E.I., Cooke, P.E., & Mendelsohn, G.A. Development and validation of an MMPI scale of assaultiveness in overcontrolled individuals. Journal of Abnormal Psychology, 1967, 72, 519-528.

Merenda, P.F., & Sparadeo, F. Rebuttal to constructive comments on "construct validity of the MacAndrew Alcoholism Scale." Journal of Consulting and Clinical Psychology, 1981, 49, 968-970.

Miller, C., Knapp, S.C., & Daniels, C.W. MMPI study of Negro mental hygiene clinic patients. Journal of Abnormal Psychology, 1968, 73, 168-173.

Miller, C., Wertz, C., & Counts, S. Racial differences on the MMPI. Journal of Clinical Psychology, 1961, 17, 159-161.

Murphree, H.B., Karabelas, M.J., & Bryan, L.L. Scores of inmates of a federal penitentiary on two scales of the MMPI. Journal of Clinical Psychology, 1962, 18, 137-139.

Murray, L., Heritage, J., & Holmes, W. Black-white comparisons on the MMPI Mini-Mult. Southern Journal of Educational Research, 1976, 10, 105-114.

National Institute of Alcoholism and Alcohol Abuse, National Institute of Mental Health. Alcohol and alcoholism: Problems, programs and progress. PHS Publication No. (HSM) 72-9127, Washington, D.C., 1972.

Navarro, D.J. Women A.A. members and nonmembers: Scores on the Holmes and MacAndrews scales of the MMPI. Journal of Studies on Alcohol, 1979, 40, 496-501.

Navran, L. A rationally derived MMPI scale to measure dependence. Journal of Consulting Psychology, 1954, 18, 192.

Nerviano, V.J., McCarty, D., & McCarty, S.M. MMPI profile

patterns of men alcoholics in two contrasting settings. Journal of Studies on Alcohol, 1980, 41, 1143-1152.

Overall, J.E. MMPI personality patterns of alcoholics and narcotic addicts. Quarterly Journal of Studies on Alcohol, 1973, 34, 104-111.

Panton, J.H. Inmate personality differences related to recidivism, age, and race as measured by the MMPI. Journal of Correctional Psychology, 1959, 4, 28-35.

Patalano, F. Personality dimensions of drug abusers who enter a drug-free therapeutic community. Psychological Reports, 1978, 42, 1063-1069.

Patterson, E.T., Charles, H.L., Woodward, W.A., Roberts, W.R., & Penk, W.E. Differences in measures of personality and family environment among black and white alcoholics. Journal of Consulting and Clinical Psychology, 1981, 49, 1-9.

Patrick, J.H., Connolly, A., & Overall, J.E. Personality correlates of alcohol abuse among new admissions to a state hospital. Proceedings of the APA, 1970, 5, (Pt. 1) 321-322.

Paulson, M.J., & Lin, T. Predicting WAIS IQ from Shipley-Hartford scores. Journal of Clinical Psychology, 1970, 26, 453-461.

Penk, W.E., & Robinowitz, R. MMPI differences of black and white drug abusers. JSAS Catalog of Selected Documents in Psychology, 1974, 4, 50. (MS. No. 630)

Penk, W.E., Robinowitz, R., Roberts, W.R., Dolan, M.P., & Atkins, H.G. MMPI differences of male Hispanic-American, black, and white heroin addicts. Journal of Consulting and Clinical Psychology, 1981, 49, 488-490.

Penk, W.E., Woodward, W.A., Robinowitz, R., & Hess, J.L. Differences in MMPI scores of black and white compulsive heroin users. Journal of Abnormal Psychology, 1978, 87, 505-513.

Pillai, K.C.S. Some new test criteria in multivariate analysis. Annals of Mathematical Statistics, 1955, 26, 117-121.

Powell, L., & Johnson, E.H. The black MMPI profile: Interpretive problems. Journal of Negro Education, 1976, 45, 27-36.

Pritchard, D.A., & Rosenblatt, A. Racial bias in the MMPI: A methodological review. Journal of Consulting and Clinical Psychology, 1980, 48, 263-267. (a)

Pritchard, D.A., & Rosenblatt, A. Reply to Gynther and Green. Journal of Consulting and Clinical Psychology, 1980, 48, 273-274. (b)

Rathus, S.A., Fox, J.A., & Ortins, J.B. The MacAndrew scale as a measure of substance abuse and delinquency among adolescents. Journal of Clinical Psychology, 1980, 36, 579-583.

Rhodes, R.J. The MacAndrew alcoholism scale: A replication Journal of Clinical Psychology, 1969, 25, 189-191.

Rhodes, R.J., & Chang, A.F. A further look at the Institutionalized Chronic Alcoholic Scale. Journal of Clinical Psychology, 1978, 34, 779-780.

Rich, C.C., & Davis, H.G. Concurrent validity of MMPI alcoholism scales. Journal of Clinical Psychology, 1969, 25, 425-426.

Roen, S.R. Personality and Negro-white intelligence. Journal of Abnormal and Social Psychology, 1960, 61, 148-150.

Rohan, W.P. MMPI changes in hospitalized alcoholics: A second study. Quarterly Journal of Studies on Alcohol, 1972, 33, 425-426.

Rohan, W.P., Tatro, R.L., & Rotman, S.R. MMPI changes in alcoholics during hospitalization. Quarterly Journal of Studies on Alcohol, 1969, 30, 389-400.

Rosen, A.C. A comparative study of alcoholic and psychiatric

patients with the MMPI. Quarterly Journal of Studies on Alcohol, 1960, 21, 253-266.

Rosenberg, N. MMPI alcoholism scales. Journal of Clinical Psychology, 1972, 28, 515-522.

Rosenblatt, A., & Pritchard, D.A. Moderators of racial differences on the MMPI. Journal of Consulting and Clinical Psychology, 1978, 46, 1572-1573.

Rotman, S.R., & Vestre, N.D. The use of the MMPI in identifying problem drinkers among psychiatric hospital admissions. Journal of Clinical Psychology, 1964, 20, 526-530.

Ruff, C.F., Ayers, J., & Templer, D.I. Alcoholics' and criminals' similarity of scores on the MacAndrew alcoholism scale. Psychological Reports, 1975, 36, 921-922.

Schroeder, D.J., & Piercy, D.C. A comparison of MMPI two-point codes in four alcoholism treatment facilities. Journal of Clinical Psychology, 1979, 35, 656-663.

Schwartz, M.F., & Graham, J.R. Construct validity of the MacAndrew alcoholism scale. Journal of Consulting and Clinical Psychology, 1979, 47, 1090-1095.

Shore, R.E. A statistical note on "Differential misdiagnosis of blacks and whites by the MMPI." Journal of Personality Assessment, 1976, 40, 21-23.

Sines, L.K., & Simmons, H. The Shipley-Hartford Scale and the Doppelt short form as estimates of WAIS IQ in a state hospital population. Journal of Clinical Psychology, 1959, 15, 452-453.

Strauss, M.E., Gynther, M.D., & Wallhermfechtel, J. Differential misdiagnosis of blacks and whites by the MMPI. Journal of Personality Assessment, 1974, 38, 55-60.

Sutker, P.B., & Archer, R.P. MMPI characteristics of opiate addicts, alcoholics, and other drug abusers. In C. S. Newmark (Ed.), MMPI: Current clinical and research trends. New York: Praeger, 1979.

Sutker, P.B., Archer, R.P., & Allain, A.N. Drug abuse patterns, personality characteristics, and relationships with sex, race, and sensation-seeking. Journal of Consulting and Clinical Psychology, 1978, 46, 1374-1378.

Sutker, P.B., Archer, R.P., Brantley, P.J., & Kilpatrick, D.G. Alcoholics and opiate addicts: Comparisons of personality characteristics. Journal of Studies on Alcohol, 1979, 40, 635-644.

Sutker, P.B., Brantley, P.J., & Allain, A.N. MMPI response patterns and alcohol consumption in DUI offenders. Journal of Consulting and Clinical Psychology, 1980, 48, 350-355.

Swenson, W.M. Structured personality testing in the aged: An MMPI study of the gerontic population. Journal of Clinical Psychology, 1961, 17, 302-304.

Tomsovic, M. A follow-up study of discharged alcoholics. Hospital Community Psychiatry, 1970, 21, 94-97.

Uecker, A.E. Differentiating male alcoholics from other psychiatric inpatients: Validity of the MacAndrew scale. Quarterly Journal of Studies on Alcohol, 1970, 31, 379-383.

Uecker, A.E., Boutilier, L.R., & Richardson, E.H. "Indianism" and MMPI scores of men alcoholics. Journal of Studies on Alcohol, 1980, 41, 357-362.

Uecker, A.E., Kish, G.B., & Ball, M.E. Differentiation of alcoholism from general psychopathology by means of two MMPI scales. Journal of Clinical Psychology, 1969, 25, 287-289.

Vega, A. Cross-validation of four MMPI scales for alcoholism. Quarterly Journal of Studies on Alcohol, 1971, 32, 791-797.

Welsh, G.S. Factor dimensions A and R. In G.S. Welsh & W.G. Dahlstrom (Eds.), Basic readings on the MMPI in psychology and medicine. Minneapolis: University of Minnesota Press, 1956.

Whisler, R.H., & Cantor, J.M. The MacAndrew alcoholism scale: A cross-validation in a domiciliary setting. Journal of

of Clinical Psychology, 1966, 22, 311-312.

Whitelock, P.R., Overall, J.E., & Patrick, J.H. Personality patterns and alcohol abuse in a state hospital population. Journal of Abnormal Psychology, 1971, 78, 9-16.

Wiggins, J.S. Substantive dimensions of self-report in the MMPI item pool. Psychological Monographs, 1966, 80, (22, whole No. 630).

Williams, A.F., McCourt, W.F., & Schneider, L. Personality self-descriptions of alcoholics and heavy drinkers. Quarterly Journal of Studies on Alcohol, 1971, 32, 310-317.

Willis, K.A., Wehler, R., & Rush, W.A. MacAndrew scale scores of smoking and nonsmoking alcoholics. Journal of Studies on Alcohol, 1979, 40, 906-907.

Wilson, A., Mabry, E.A., Khavari, K.A., & Dalpes, D. Discriminative analysis of MMPI profiles for demographic classifications of male alcoholics. Journal of Studies on Alcohol, 1977, 38, 47-57.

Witt, P.H., & Gynther, M.D. Another explanation for black-white MMPI differences. Journal of Clinical Psychology, 1975, 31, 69-70.

Zelen, S.L., Fox, J., Gould, E., & Olson, A.W. Sex-contingent differences between male and female alcoholics. Journal of Clinical Psychology, 1966, 22, 160-165.

APPENDIX A

Chart Audit Form

Patient _____ Date _____

Patient's Age _____

Ethnicity
____ White
____ Black
____ Mex-Am
____ Other

Sex
____ Male
____ Female

Status
____ Active Duty
____ Dependent
____ Retired
____ Other

Military Rank
____ enlisted
____ NCO
____ Junior Off.
____ Field Off.

Current Marital
____ Single
____ Married
____ Sep/Divorced
____ Widowed

Marital History
____ No pre. div.
____ One pre. div.
____ Mult. pre. div.
____ Widowed Remarried

Criminal Record
____ Person Crimes
____ Pers. Vio. Cr.
____ Property Cr.
____ Other
____ None

Alcohol Usage
____ Abstain
____ Moderate
____ Frequent
____ Prob. Drink.

IQ (Estimate)

_____

Diagnosis
1. _____
2. _____

Other
_____
_____
_____
_____
_____

Symptom Checklist

Directions: Please check the symptoms documented in patient's clinical chart and/or observed by you on the ward. When a blank space is provided try to be more specific. For example: Hallucinations auditory. Feel free to "write in" any symptoms not covered by the checklist in the blanks provided at the bottom of this column.

____ Agitation
____ Ambivalence
____ Amnesia
____ Anxiety/Tension
____ Blocking
____ Compulsiveness
____ Defensiveness
____ Delusions _____
____ Dependent
____ Depersonalization/Derealization
____ Depression
____ Difficulty Concentrating
____ Disturbed thought
____ Emotionally inappropriate
____ Excitability
____ Guilt
____ Hallucinations _____
____ Hostile/Angry
____ Hyperactive
____ Impulsivity
____ Indecision
____ Inferiority
____ Irritability
____ Negativism
____ Obsessional/Ruminative
____ Passivity
____ Perfectionistic
____ Phobic/Fearful
____ Physical Aggression
____ Poor judgement
____ Poor memory
____ Religiosity
____ Restless
____ Rigid
____ Sensitive/Touchy
____ Sexual Difficulties
____ Somatic Complaints _____
____ Suicidal ideation
____ Suspiciousness
____ Talkativeness
____ Tremor/Trembling
____ Withdrawn
____ _____

APPENDIX B

The MacAndrew Alcoholism Scale

The MacAndrew Alcoholism Scale

	MMPI No.	Alcoholic Response	Item
1.	156	T	I have had periods in which I carried on activities without knowing later what I had been doing.
2.	294	F	I have never been in trouble with the law.
3.	61	T	I have not lived the right kind of life.
4.	140	T	I like to cook.
5.	263	T	I sweat very easily even on cool days.
6.	224	T	My parents have often objected to the kind of people I went around with.
7.	419	T	I played hooky from school quite often as a youngster.
8.	529	T	I would like to wear expensive clothes.
9.	56	T	As a youngster I was suspended from school one or more times for cutting up.
10.	482	T	While on trains, buses, etc., I often talk to strangers.
11.	488	T	I pray several times every week.
12.	413	T	I deserve severe punishment for my sins.
13.	251	T	I have had blank spells in which my activities were interrupted and I did not know what was going on around me.
14.	34	T	I have a cough most of the time.
15.	378	F	I do not like to see women smoke.
16.	120	F	My table manners are not quite as good at home as when I am out in company.
17.	243	T	I have few or no pains.
18.	94	T	I do many things which I regret afterwards (I regret things more often than

	MMPI No.	Alcoholic Response	Item
			others seem to).
19.	6	T	I like to read newspaper articles on crime.
20.	179	F	I am worried about sex matters.
21.	50	T	My soul sometimes leaves my body.
22.	483	T	Christ performed miracles such as changing water into wine.
23.	127	T	I know who is responsible for most of my troubles.
24.	128	T	The sight of blood neither frightens me nor makes me sick.
25.	335	F	I cannot keep my mind on one thing.
26.	118	T	In school I was sometimes sent to the principal for cutting up.
27.	562	T	The one to whom I was most attached and whom I most admired as a child was a woman (Mother, sister, aunt, or other women).
28.	356	F	I have more trouble concentrating than others seem to have.
29.	57	T	I am a good mixer.
30.	116	T	I enjoy a race or game better when I bet on it.
31.	446	T	I enjoy gambling for small stakes.
32.	186	T	I frequently notice my hand shakes when I try to do something.
33.	58	T	Everything is turning out just like the prophets of the Bible said it would.
34.	477	T	If I were in trouble with several friends who were equally to blame, I would rather take the whole blame rather than give them away.

	MMPI No.	Alcoholic Response	Item
35.	445	T	I was fond of excitement when I was young (or in childhood).
36.	426	T	I have at times had to be rough with people who were rude or annoying.
37.	283	T	If I were a reporter I would very much like to report sporting news.
38.	86	F	I am certainly lacking in self-confidence.
39.	507	T	I have frequently worked under people who seem to have things arranged so that they get credit for good work but are able to pass off mistakes onto those under them.
40.	500	T	I readily become one hundred per cent sold on a good idea.
41.	81	T	I think I would like the kind of work a forest ranger does.
42.	27	T	Evil spirits possess me at times.
43.	320	F	Many of my dreams are about sex matters.
44.	173	F	I liked school.
45.	235	T	I have been quite independent and free from family rule.
46.	278	F	I have often felt that strangers were looking at me critically.
47.	149	F	I used to keep a diary.
48.	309	T	I seem to make friends about as quickly as others do.
49.	130	F	I have never vomited blood or coughed up blood.