AN ABSTRACT OF THE THESIS OF

_____Karen L. Olson_____ for the __Master of Science__

in ___Psychology___ presented on __February 23, 1990__

Title: ____A Study of the Effect of Gender on the____

__MacAndrew Alcoholism Scale's Ability to Identify__
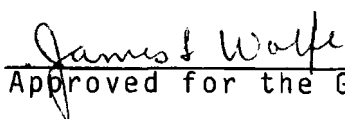
__Alcoholic and Psychiatric Outpatients__

Abstract approved by: _Creacy B. Holmes_

The increasing concern over the treatment of
chemical dependency has caused an increasing need for
proper screening devices. This study investigated the
MacAndrew Alcoholism Scale scores of four groups: male
alcoholic, female alcoholic, male psychiatric, and
female psychiatric outpatients. The purpose was to
determine if the scale correctly identified diagnosed
male and female alcohol dependents at a significantly
higher rate than non-alcoholic, psychiatric controls. A

two-way analysis of variance was used and the alcoholic
groups scored significantly higher than the psychiatric
groups. However, no significant differences existed
between the gender groups. Results indicated caution in
using the MacAndrew scale due to the similarity of the
group mean scores and high false positive and negative
rates. The limitations of the study and suggestions for
future research are discussed.

Approved for the Major Department

Approved for the Graduate Council

A STUDY OF THE EFFECT OF GENDER ON THE

MACANDREW ALCOHOLISM SCALE'S ABILITY TO IDENTIFY

ALCOHOLIC AND PSYCHIATRIC OUTPATIENTS

A Thesis

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The Division of Psychology and Special Education

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of the Requirements for the Degree

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by

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CHAPTER 1

INTRODUCTION

Alcohol abuse and dependency has become an ever
increasing societal concern (Wisniewski, Glenwick, &
Graham, 1985). With this increasing concern comes a
growing need for intervention and treatment. Proper
intervention and treatment requires proper
identification. A number of tests have been developed
to assist in identification. The Minnesota Multiphasic
Personality Test (MMPI) item pool has been used to
develop a number of scales to assist in the diagnosis of
alcoholism.

Initial MMPI alcoholism scales were developed using
male alcoholics and "normal" non-alcoholics (Hampton,
1953; Holmes, 1953; Hoyt & Sedlacek, 1958). MacAndrew
(1965) compared 300 alcoholic and 300 psychiatric
outpatients. A 49 item scale was developed which
correctly classified 81.5% as alcoholic. In addition,
composite scales based on the above scales were
developed by Rich and Davis (1969), Rosenberg (1972),
and Atsaides, Neuringer, and Davis (1977). Of the above

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scales, the MacAndrew scale has been the most widely
used and researched (Galizio & Maisto, 1985).

Development of the MacAndrew Alcoholism Scale began
with a critique by MacAndrew and Geertsma (1964). These
authors questioned the use of normal samples in the
development of alcoholism scales. In their study the
Hampton, Holmes, and Hoyt-Sedlacek scales demonstrated
an inability to differentiate 300 alcoholic and 300
psychiatric outpatients. Thus, the conclusion was made
that the prior scales were measures of maladjustment
rather than alcoholism.

In response to the above findings and conclusions,
MacAndrew (1965) conducted further research with the
same population of 600 predominantly white,
heterogeneous male outpatients. This sample was
utilized to determine if alcoholics are "neurotics-who-
also-happen-to-drink-too-much" (p. 238), or if a
significant difference exists between alcoholics and
those with psychiatric problems. Chi square analysis of
the MMPI item pool isolated 51 items which significantly
identified alcoholic and psychiatric subjects at the .01
level. Two items, #215 and #460, were directly related
to alcohol consumption and were eliminated from the
scale. The remaining 49 items, using a cut-off score of
24, correctly classified alcoholics at a rate of 81.75%

in the standardization group and 81.50% in the
cross-validation group. False negative rates were 8.75%
and 8.50% for each group respectively; false positive
rates were 9.50% and 10% respectively. Adding the two
alcohol consumption items only minimally increased
correct classification rates and inclusion of these
items appeared to be "insufficient to counterbalance the
validity shrinkage" (p. 245) associated with lying.

An attempt was made to replicate the results
obtained by MacAndrew (1965). Rhodes (1969) divided two
groups of randomly sampled males into alcoholic and
non-alcoholic groups. Using the original cut-off score
of 24 an overall accuracy rate of 76% was demonstrated
with 10% false negatives and 14% false positives. These
findings supported those of MacAndrew (1965). A cut-off
score of 28, suggested by Whisler and Cantor (1966),
demonstrated an overall accuracy rate of 69% and
supported the use of the MacAndrew as a screening device
with a cut-off score of 24.

Vega (1971) conducted a cross-validation study of
the Hampton (Ha), Holmes (Ho), Hoyt-Sedlacek (H-S), and
MacAndrew (MAC) scales with alcoholic and psychiatric
inpatients and normal controls. The H-S scale was found
unable to differentiate between the three groups. The
Ha and Ho scales were significantly capable of

differentiating alcoholics and normal controls, while
the MAC scale was able to differentiate alcoholic and
psychiatric controls. Thus, findings related to the
normative groups used in the development of the above
scales, and Vega (1971) advised consideration of the
population when applying the scales.

Other researchers raised the possibility that an
alcoholism scale composed of items found on previous
scales would produce higher diagnostic rates. Rich and
Davis (1969) compared the MAC, Ha, Ho, and H-S, and
their revised, AREV, scales. Three samples were
studied: male and female alcoholic inpatients,
psychiatric inpatients, and "normal" controls. All
scales demonstrated diagnostic abilities at the .01
level. However, the Ho, AREV, and MAC scales proved to
be of superior validity. Similarly, Rosenberg (1972)
composed a 27 item scale (Ros). MAC, H-S, Ho, and Ros
scores were obtained from male alcoholic and psychiatric
inpatients. With the exception of the Ha scale, all
scales were proven valid. Likewise, Atsaides,
Neuringer, and Davis (1977) developed an eight item
scale, the Institutionalized Chronic Alcoholism Scale
(ICAS), using item analysis of the Ho, H-S, and MAC
scales. Again, male inpatients were used, neurotics and
alcoholics. The ICAS correctly classified 85.71% of the

alcoholic and 84.29% of the neurotic subjects while the MAC correctly classified 67.71% and 68.57% respectively. These statistics conflicted with the overall classification rate of 81.50% found by MacAndrew (1965). However, a replication of the Atsaides, Neuringer, and Davis (1977) study using three male groups consisting of alcoholic, neurotic, and heroin addicted inpatients demonstrated an overall classification rate of 78% for the ICAS and proved to be less effective than the MAC and Ho scales. With a cut-off of 28, the MAC classified 76% of the neurotics and 72% of the alcoholics. Yet, neither the ICAS, Ho, nor MAC scales correctly identified heroin addicts at a significant level.

A number of studies questioned the validity of MMPI alcoholism scales and raised the possibility that the scales may be sensitive to personality traits other than alcoholism. For instance, Gilchrist (1987) found that neither the Ha, Ho, H-S, Ros, nor MAC scales demonstrated significant abilities "to differentiate between alcoholic and non-alcoholic samples" (p. 28). The MAC scale was capable of identifying non-alcoholics. Holmes, Dungan, and McLaughlin (1982) compared Ha, Ho, H-S, Ros, and MAC scores of court-committed and self-committed alcoholic and non-alcoholic psychiatric male inpatients. It was noted that all five scales

claimed to measure alcoholism; yet, only have three items in common. Also, noted were inconsistencies in validity research and the use of heterogeneous rather than homogeneous-typed alcoholic sample groups. A 3 x 3 chi square analysis was used with the three groups. Results proved disappointing and the authors stated that the scales should be "used with caution, if at all" (p. 664). The MAC scale, specifically, misclassified 36 out of 60 alcoholics.

This study was refuted by Hays and Stacy (1983) who questioned the authors' interpretation of the chi square analysis. Using the Holmes, Dungan, and McLaughlin (1982) data, the authors developed a 2 x 3 design and concluded that four out of five of the scales significantly identified alcoholics and non-alcoholics. However, due to high rates of false positives and negatives, Hays and Stacy (1983), also recommended caution in the use of the alcoholism scales. In response, Holmes, Dungan, and Davis (1984) stood by the original findings by stating that simply a casual look at the data reveals a large number of misclassifications and that the original statistical analysis was correct.

The MAC scale has been compared to other scales not derived from the MMPI. For example, Freidrich and Loftsgard (1978) compared MAC and Michigan Alcoholism

Screening Test (MAST) scores of 100 subjects (14
female). Using a cut-off score of 24, the MAC labeled
71 out of 100 of the subjects as alcoholic. The MAST
labeled 79 out of 100 as alcoholic with a cut-off score
of five, and 90 out of 100 with a cut-off score of
seven. A significant correlation was established
between MAC and MAST scores. The MAST was found to be a
shorter, more effective screening device for those
willing to admit to a problem with alcohol. As opposed
to the MAST, the MAC was described as "indirect"
(p. 1940) and having lower face validity. More research
into the effectiveness of both scales was suggested.
Another scale with low face validity and less
vulnerability to faking, the Drug and Alcohol Abuse
Predictor (DAAP), was developed using the MAC, two
anomie, and an authoritarian scales (Bruder, 1982).
With two sample groups of primarily white, male
alcoholic and psychiatric inpatients, the DAAP
demonstrated an overall classification rate of 58.33%
(60% alcoholic and 57% psychiatric). The MAC
demonstrated an overall correct classification rate of
55% (80% alcoholic and 30% psychiatric). Results
revealed that the DAAP classified a greater number of
inpatient subjects than the MAC, although precision of

the DAAP was not equal to the MAC with outpatient
populations.

Reviews of MAC studies cited overall correct
classification rates from 60 to 80% for the MAC
(Apheldorph, 1978; Clopton, 1978). Although developed
with outpatients, Clopton (1978) reported that the MAC
demonstrated value in a variety of settings. However,
it was suggested that the cut-off score of 24 may need
to be changed depending on the treatment setting.
Apheldorph (1978) reported comparable results; yet,
cited some criticism of prior MAC studies. For
instance, investigators were criticized for unclear
definitions of alcoholism, lack of pre-alcoholic
studies, and not dividing alcoholic samples into
homogeneous groups as cited by Holmes, Dungan, and
McLaughlin (1982). Inconsistent results were, also,
noted as a problem associated with the scale. Further,
MacAndrew (1965) was criticized for not describing his
psychiatric group and making no distinction between
alcoholism and character disorders. Exclusion of the
two alcohol consumption items was cited as problematic
in that other items related to heavy drinking were
included in the scale. Additionally, Apheldorph (1978)
reviewed the possibility that the scale may be a measure
of addiction in general and limited to differentiating

alcoholics from psychiatric as opposed to normal populations. Lastly, it was stated that the "content of MMPI items is, in general, psychopathological in nature" (p. 42) which raised the possibility that any scale derived from the MMPI item pool would be "restricted and incapable of identifying the full range" (p. 42) of alcoholic personality traits.

McAndrew (1979) investigated the use of his scale independent of the MMPI test. Nominal differences were found between scores obtained from the MAC alone or as part of the MMPI test. However, inclusion of the L scale was recommended and a suggestion was made that protocols with L scores greater than nine should be considered valid. In addition, many studies excluded profiles with F scores at or above sixteen (Atsaides, Neuringer & Davis, 1977; Burke & Marcus, 1977; DeGroot & Adamson, 1977; Rhodes, 1969; Rhodes, 1978). On the other hand, Apheldorph and Hunley (1976) found an insignificant correlation between F scores and the MAC and Ho scales and questioned the exclusion of results with F scores at or above sixteen when studying the MAC scale. These authors concluded that such exclusion was unnecessary due to a lack of gain in statistical differences and loss of data on subjects with alcohol-use problems.

Clopton, Weiner, and Davis (1980) compared the MAC and thirteen MMPI scales. Subjects in this study were male alcoholic and non-alcoholic psychiatric patients. Alcoholic subjects obtained significantly higher MAC scores than non-alcoholics. The cut-off score of 27 was determined to be most accurate. Yet, initial comparisons demonstrated that the thirteen scales performed better by correctly classifying 83% of the subjects versus 68% correct classification by the MAC scale. However, on cross-validation the MAC performed better by correctly identifying 66% of the subjects versus 50% classification by the thirteen scales. Although the authors concluded that the thirteen MMPI scales identified alcoholic and psychiatric patients, they supported use of the scale as a screening device for alcohol abusive patients.

Despite conflicting rates of classification, MAC scores have been found to be stable and enduring. MAC scores have remained unchanged throughout treatment when compared to other MMPI scales and changed drinking behaviors (Lachar, Berman, Grisell, & Schooff, 1976). Chang, Caldwell, and Moss (1973) observed that chronic male alcoholics scored at or above 24 even when not using alcohol. Testing at the beginning and retesting at the sixth and twelfth months of treatment

demonstrated consistent results. These results
replicated those of Rohan (1972) who discovered that the
MAC identified 85% of an alcoholic group before and
after treatment. Similarly, Huber and Danahy (1975)
found no significant differences "between pretreatment
and post-treatment means" (p. 1234).

Hoffman, Loper, and Kammeier (1974) concluded that
MAC scores reflected personality traits associated with
the development of alcoholism in that elevated scores of
male college students who later developed alcoholism
remained significantly high following the onset of
alcoholism. Thus, the MAC scale appeared to measure
addictiveness as a personality trait rather than the
psychological effects of alcohol use. As stated
earlier, Apheldorph (1978) found that the MAC was most
effective in differentiating alcoholics from psychiatric
populations and suggested that alcoholics have "symptoms
and personality traits" (p. 48) unique from psychiatric
disturbance. This observation supported conclusions by
Vega (1971) that psychiatric disturbance and alcoholism
may not be related based on findings that "normal"
controls scored higher than psychiatric controls on the
scale.

Studies utilizing samples addicted to substances
other than alcohol have supported the hypothesis that

the MAC is a measure of general addictive potential.
Kranitz (1972) found that heroin addicts and alcoholics
produced similar scores which differed from inpatient
and outpatient controls. In response, Lachar, Berman,
Grisell, and Schooff (1976) compared the scores of
inpatient alcoholics, inpatient and outpatient heroin
addicts, inpatient poly-drug dependents, and matched
psychiatric controls with and without histories of
substance abuse. No significant differences were found
between the three groups of substance abusers. Yet,
each group received significantly higher scores than
matched controls with no history of substance abuse.
Controls with a history of substance abuse scored
significantly higher than those without a substance
abuse history. Similarly, 222 MMPI scores of V.A.
inpatients revealed that MAC scores discriminated
alcoholics from schizophrenics and other patients with
no history of substance abuse (Burke & Marcus, 1977).
However, again, the scale was unable to differentiate
alcoholics from other drug abusers. Lastly, Willis,
Wehler, and Rush (1979) observed that 19 smokers out of
141 predominantly white, male inpatients had
significantly higher MAC means than nonsmokers. Thus,
the MAC appeared to be a valid screening device for
addiction to drugs other than alcohol.

A number of studies have attempted to determine
what traits, other than alcoholism, are measured by the
MAC. For instance, Ruff, Ayers, and Templar (1975)
suggested that the scale measured the tendency to act
out rather than alcohol abuse. These authors concluded
that the MAC was not useful in that the scale was unable
to differentiate alcoholics and criminally charged
psychiatric patients. However, of note, this study was
criticized in that criminal and psychiatric controls
were not screened for alcoholics.

Chang, Caldwell, and Moss (1973) found elevations
on scale 4, the Psychopathic Deviate Scale on the MMPI,
consistently in studies of alcoholics. Rohan (1972)
observed that hospitalized alcoholics typically had 2-4
MMPI profiles prior to treatment. Post-treatment
testing revealed lower scores on scale 2, the Depression
scale; however, scale 4 remained elevated. As a result,
the authors concluded that elevated MAC scores may
reflect characteristics similar to those associated with
elevated Psychopathic Deviate scores.

Similar results were found by Pfost, Kunce, and
Stevens (1984) who analyzed MMPI profiles and MAC scores
of white, male alcoholic inpatients and developed three
profile types. The second profile type, characterized
by elevated MMPI F, K, 4, 9, and MAC scale scores

correlated positively with temperamental, driving, and grandiose traits. A suggestion was made that the high rate of false positives found in many studies may be related to characteristics associated with the type two profile. Finney, Smith, Skeetes, and Auvenshine (1971) found comparable characteristics through factor and content analysis. Factors associated with elevated MAC scores included rebelliousness, resentment of authority, anxiety, boldness, compulsivity, unconscious conflicts, general hostility, and favorability. High scorers could be described as "bold, uninhibited, self-confident, sociable people who mix well with others" (p. 1058).

Next, Schwartz (1977) conducted a construct validity study of the MAC to determine what traits, other than alcoholism, the scale measures. The scale was found to be sensitive to general anti-social traits. Elevated scores were associated with high energy levels, shallowness in interpersonal relationships, general psychological maladjustment, and impulsivity. Similarly, impulsivity and the potential to act out were found to be positively related to elevated MAC scores by Burke (1983). In addition, a negative relationship was found between significant MAC scores and control. These findings were associated with behaviors which may lead to the misuse of alcohol and other drugs. Although

there was no indication that the MAC measures general
addictive potential, Burke (1983) suggested that the
scale may be useful in identifying substance abusers.

Lachar, Berman, Grisell, and Schooff (1976)
concurred with the possibility that the scale may
measure personality traits associated with substance
abuse. Comparing MAC scores and clinical traits, these
authors found that high scores were associated with, not
only excessive alcohol use, but "marital conflict
(p < .001), financial problems, assultiveness, and
immaturity (p < .01) and suicidal thoughts (p < .01),
talkativeness (p < .02), sense of inadequacy-
inferiority, nausea-vomiting (p < .05), ambivalence,
anxiety, depression and visual problems (p < .01)"
(p. 1613). Friedrich and Loftsgard (1978) found
significant relationships between MAC scores and age and
employment, and suggested that the scale best identified
older, less-educated, part-time or unemployed alcoholics
who had prior arrests and used other drugs. Findings
indicated that this instrument was most "useful in
identifying subjects in the more advanced stages of
alcoholism" (p. 1943).

MacAndrew (1967) conducted a study to prove that
alcoholics are not "simply 'neurotics-who-also-happen-
to-drink-too-much'" (p. 50). Factor analysis of the MAC

scores from the normative alcoholic group demonstrated
thirteen factors which differentiated high scorers from
psychiatric controls. For example, high scorers
(alcoholics) were less likely to admit sexual dreams or
worries and less likely to report difficulties
concentrating or lack of self-confidence than
psychiatric patients. Alcoholics tended to be less
critical of others; yet, reported general
dissatisfaction with life. Conversely, alcoholics
claimed to be more outgoing and socially comfortable.
The tendency to enjoy gambling was evident and may
reflect a general dimension of boredom. Also, high
scorers reported a higher incidence of discipline
problems in school and independence from family rule.
However, this factor indicating independence from family
rule was criticized by Rosenberg (1972) because only one
item made up this factor. To continue, outpatient
alcoholics with significant MAC scores admitted a
greater incidence of present suffering from the
consequences of wrong doing; yet, reported praying more
and feeling that they deserved more punishment for their
sins than psychiatric patients. Next, high scorers
tended to take more personal responsibility for their
present situations. Alcoholics were more prone to
experience somatized anxiety; however, reported fewer

bodily pains. The two remaining factors related to the

chronic, deteriorating alcoholic and blackouts. Again,

although many of the above factors were verified by

later studies, Rosenberg (1972) criticized the factor

analysis by stating that each of the thirteen factors

contained four or less items.

Next, in a review of literature, MacAndrew (1981)

stated that the scale was unaffected by race and short

or long-term effects and consequence of drinking,

implying the stability of the measure. In addition, the

author suggested that the scale identified primary

alcoholics who developed their drinking behaviors before

the onset of emotional problems and whose behavior are

motivated by reward-seeking. Later, Pfost, Kunce, and

Stevens (1984) supported this hypothesis by comparing

characteristics of the type two profile to those of

primary alcoholism.

In an attempt to test the applicability of the MAC,

its usefulness with populations other than alcoholic and

psychiatric outpatients has been studied. For instance,

the usefulness of the MAC as a screening device in a

general hospital acute psychiatric setting was studied

by DeGroot and Adamson (1973). MMPI results of 255 male

admissions were subjected to chi square analysis and 39

items significantly differentiating alcoholics from

other psychiatric diagnoses. In response, a 37 item
scale was developed and compared to the MAC. Using cut-
off scores of 24 and 26, the MAC obtained overall
correct classification rates of 69% and 73.50%
respectively. The 37 item, derived scale accurately
classified 81% of the subjects using a cut-off score of
22. The MAC was found to be inaccurate in
discriminating alcoholics from those with character
disorders and neurotic diagnoses. A high number of
false positives were evident and the inclusion of the
two alcohol consumption items was recommended to
compensate for this occurrence. Although the MAC
demonstrated effectiveness in identifying alcoholics in
this population, overall results were less than those
obtained in the developmental study by MacAndrew (1965).

Two studies utilized medical patients. First,
Colligan, Davis, Morge, and Kenneth (1988) found that
all of the alcoholism scales discussed earlier; Ha, Ho,
H-S, MAC, AREV, ROS, and ICAS, failed to be effective as
screening devices for alcoholism among medical patients.
In fact, the MMPI item, "I have used alcohol
excessively," was more effective than any of the scales.
The MAC obtained a high rate of false positives and
negatives and appeared especially weak in identifying
female alcoholics. Next, a study by Steenman and Herman

(1988) demonstrated that the MAC misclassified epileptics at high rates; 48.39%, 30.65%, 20.97%, and 9.68% with cut-off scores of 24, 26, 28, and 30 respectively. The high rate of false positives were attributable to possible similarities in "experiential and behavioral characteristics between seizure patients and substance abusers" (p. 457).

Uecker (1970) conducted a study to determine the ability of the MAC to differentiate male alcoholic and non-alcoholic psychiatric inpatients. A significant difference was found between the two group means. Although use of the scale as a screening device for inpatients was advocated, high false positive rates were evident and classification rates were not as high as those found with outpatients.

Other studies were designed to examine the effects of demographic variables such as age, race, and gender. The MAC was found to be a valid screening device among adolescents according to Wisniewski and Glenwick (1985). Male and female ninth and twelfth graders were tested and step-wise multiple regression analysis revealed that the MAC was the single best predictor of alcohol and drug abuse. Prediction was improved when scores were combined with sociodemographic information. On the other hand, Rathus, Fox, and Ortins (1980) questioned

the validity of the MAC with adolescents, suggesting
that alcohol abuse differs between adolescents and
adults. The scale was determined to be a significant
predictor of self-reported frequency of drinking and
drug abuse; yet, was also sensitive to the commission of
personal and property crimes. Thus, the authors
concluded that elevated MAC scores may indicate
increased delinquent behavior and/or the tendency to
overstate such behavior.

Whisler and Cantor (1966) conducted a cross-
validation study to determine the ability of the scale
to identify alcoholics and chronic, institutionalized
patients. The mean age of the male sample groups was
older than the overall group mean age of the groups used
by MacAndrew (1965). Specifically, the MacAndrew (1965)
sample groups mean age was 38.25 compared to 46.80 and
43.90 for the alcoholic and non-alcoholic groups
respectively. A cut-off score of 24 produced an overall
classification rate of 55.0% with 7.9% false negatives
and 31.1% false positives. A cut-off score of 28
produced an overall classification rate of 61.50% with
17.89% false negatives and 20.70% false positives. The
cut-off score of 28 was advocated as a useful predictor
of alcoholic behavior. Although Whisler and Cantor
(1966) supported the use of the scale, Rhodes (1969)

criticized the use of "older, more institutionalized, of lower socio-economic level" (p. 191) subjects by citing the possibility that a higher number of alcoholics may have been in the control group.

Despite this criticism, Apheldorph and Hunley (1975) supported the utility of the scale with older problem drinkers and reported that the Ho and MAC performed better with this population than the Ha. Subjects included domiciled patients, alcoholics, and non-alcoholics with disciplinary problems, and non-alcoholic controls, with a mean age of 51.4. The MAC significantly differentiated alcoholics and non-alcoholics with disciplinary problems from non-alcoholic controls; however, the scale was unable to discriminate between alcoholic and disciplinary groups. Another study by Apheldorph and Hunley (1981) attempted to determine the validity of the MAC by the scale's ability to identify alcoholics from psychiatric patients and determine if the scale was a "measure of excessive versus nonexcessive drinking" (p. 80). Samples included 309 male domicile patients divided into four groups: alcoholic excessive drinkers, alcoholic nonexcessive drinkers, non-alcoholic excessive drinkers, and non-alcoholic nonexcessive drinkers, with a mean age of 53.7. Results supported the validity of the scale in

that high scores correlated with the diagnosis of
alcoholism and low scores correlated with more severe
psychiatric diagnoses. However, no correlation was
found between MAC scores and age which suggested that
the scale measured personality traits independent of
age. This finding conflicted with the earlier results
by Apheldorph and Hunley (1975) which found a negative
correlation and suggested that traits measured by the
MAC "may diminish with age" (p. 652). In addition,
results obtained by Apheldorph and Hunley (1981) did not
support the use of the scale as a screening device for
excessive drinking. Yet, the scale appeared to measure
stable personality characteristics present in practicing
and abstinent alcoholics.

Despite a statement by MacAndrew (1981) that his
alcoholism scale was unaffected by race, other studies
have found conflicting results. A study was conducted
to determine the MAC's ability to identify black and
white alcoholics and black and white non-alcoholics
(Walters, 1983). Results conflicted with those obtained
by Uecker (1971) and Lachar, Berman, Grisell, and
Schooff (1976) in that the scale was found to be less
useful with black subjects than white subjects. Black
and white alcoholics scored similarly; yet, black non-
alcoholic subjects scored significantly different than

white, non-alcoholic subjects. The scale discriminated 66.3% of white alcoholics and non-alcoholics, but only 55.5% of the black alcoholics and non-alcoholics. Zagar and Megaree (1981) found the MAC and H-S scales invalid when applied to samples of young (M age = 22.3), black and white, male inmates.

Relatively few of the previously cited studies included female subjects. Butcher and Telligan (1978), Freidrich and Loftsgard (1978), Rathus, Fox, and Ortins (1980), and Bruder (1982) utilized female subjects; yet, like the Conley and Kammeier (1980) study, these studies did not examine the influence of gender on the MAC scale's ability to identify alcoholics. Conley and Kammeier (1980) simply found seven items, six of which are on the MAC, which identified male and female alcoholics better than the Ha, Ho, H-S, Ros, and MAC . Friedrich and Loftsgard (1978) examined the MAST and MAC responses of women married to problem drinkers and factors influencing MAC scores. MAC scores appeared to reflect disturbed and/or acting out behaviors.

Several studies have used female subjects exclusively. For example, Jones, Jones, and Watcher (1980) studied the effects of menstruation on cognitive performance between alcoholics and non-alcoholics. Similar scores were obtained on four alcoholism scales;

Ha, Ho, H-S, and MAC, by menstruating and nonmenstruating alcoholics. Menstruation appeared to have no effect on test results of female alcoholics and non-alcoholics. Another study examined MAC scores of female inpatient substance abusers and outpatient bulimics to test the possibility that the scale is a measure of addictive behavior (Hatsukami, Owen, Pyle, & Mitchell, 1982). Substance abusers scored significantly higher, which suggested that the scale does not measure addiction in general.

Navarro (1979) found that the MAC and Ho were incapable of differentiating between groups of females, alcoholic A.A. members, non-alcoholic psychiatric inpatients, and non-alcoholic control subjects. MAC mean scores were remarkedly low; 9.53, 10.45, and 7.78, for the alcoholic, psychiatric, and control groups respectively. Generalizing results from this study would be problematic due to the use of A.A. members in the alcoholic group. In contrast, Johnston (1986) reported that the group mean obtained by female alcoholics, 25.63, was significantly higher than first time D.U.I. offenders, non-alcoholic psychiatric outpatients, and non-alcoholic control subjects. However, this alcoholic group mean was somewhat lower than male alcoholic group means reported in other

studies. The female psychiatric group mean was lower than that obtained by the control group which was noted in studies utilizing male subjects (DeGroot & Adamson, 1973; MacAndrew, 1965; Rhodes, 1969; Vega, 1971).

Studies utilizing male and female subjects supported the use of the MAC with both sexes. However, differing cut-off scores have been suggested. Svanum, Levitt, and McAdoo (1982) as cited by Svanum (1985) and Jones, Jones, and Watcher (1980) advocated the same cut-off scores for female and male subjects, labeling as alcoholic those subjects with scores greater than 23. Yet, Schwartz and Graham (1979) found that a cut-off score of 27 identified 91.5% of female alcoholics with a lowered incidence of false positive. Similarly, Wisniewski, Glenwick, and Graham (1985) proposed that the optimal cut-off score for females was 28 in that this criterion identified 76% of the female alcoholic subjects.

Although criticized for statistical design and data analysis (Merenda & Sparadeo, 1981), Schwartz and Graham (1979) conducted a study which found that the MAC successfully identified female alcoholics. Although, the scale was unable to differentiate male alcoholics from male anti-social and psychiatric patients. Rich and Davis (1969) reported that the MAC and Ho

differentiated male and female alcoholics from controls.
Compared to the Ha, Ho, H-S, and AREV scales, the MAC
was demonstrated as superior with females. Lastly,
Svanum, Levitt, and McAdoo (1982) tested the MAC and
Ros' ability to differentiate male and female alcoholic
inpatients from psychiatric outpatients. Regression
analysis was used to examine group mean differences and
the MAC differentiated male and female alcoholics from
psychiatric controls equally and at a significant level.
However, females tended to score lower than males.

   This review of literature has included the origin
and conflicting validity studies of the MMPI MAC.
Although the scale appears to be a stable measure, there
is some question that the scale may measure traits other
than alcoholism. Like similar scales, the MAC was
developed and normed using male subjects and a majority
of studies following its development have used male
subjects exclusively.

   However, in practice, this scale is routinely used
as a screening device for female alcoholics. Navarro
(1979) expressed the need to study all alcoholics and
advocated the inclusion of female subjects in all
studies of alcoholism. The few studies utilizing male
and female subjects have produced conflicting evidence
of the utility of this scale with females and for the

need of separate cut-off scores. In response to the lack of research with male and female subjects and conflicting results, this study will attempt to determine the effects of gender on the MAC's ability to identify diagnosed alcohol dependents and psychiatric outpatients. The null hypothesis is that gender will have no effect on the performance of the MAC.

CHAPTER 2

METHODS AND PROCEDURES

Sample

This study consisted of four outpatient groups: male alcoholic, female alcoholic, male psychiatric, and female psychiatric. Sample groups were drawn from client files at the Mental Health Center of East Central Kansas. Age, education, and year tested were obtained for each valid MAC score studied.

Placement in the alcoholic group required an Axis I diagnosis of alcohol dependence based on DSM III and DSM III-R criteria. Twenty-five scores were obtained from the files of women diagnosed alcohol dependents. The dates of testing spanned from 1984 to 1989. The subjects were between the ages of 18 and 53 (M = 30.96) with education of 8 to 16 years (M = 11.88). Subjects from sample pools of the remaining groups were matched as closely as possible to each of the female alcoholic subjects. Subjects in the male alcoholic group were tested between the years of 1985 to 1989. The subjects were between the ages of 18 and 61 (M = 30.68) with education of 8 to 16 years (M = 11.40).

Psychiatric subjects had no indicated history of substance abuse. The female psychiatric group represented a variety of diagnoses from an unspecified mental disorder (nonpsychotic) to bipolar, depressed. The dates of testing spanned from 1984 to 1989. Subjects were between the ages of 18 and 53 (M = 28.68) with education of 8 to 14 years (M = 11.60). The male psychiatric group represented a variety of diagnoses from an unspecified mental disorder (nonpsychotic) to bipolar, manic. The dates of testing spanned from 1985 to 1989. Subjects were between the ages of 18 and 56 (M = 31.12) with education of 8 to 16 years (M = 11.76).

Data Collection

Subjects completed the MMPI, Form R, individually or in a group setting. Only MAC scores from valid MMPI protocols were used. Profiles with Cannot Say scores less than thirty were considered valid. In addition, profiles with L scale T scores equal to or less than 65 F scale T scores equal to or less than 80, and K scale T scores equal to or less than 70 were considered valid. The MMPI protocols were hand or computer scored.

Design

This study was designed to study differences between alcoholics and non-alcoholic psychiatric controls and the effect of gender on identification by

the MAC scale. Independent variables were the classification by gender, male and female, and diagnosis, alcoholic or psychiatric. The dependent variable was the MAC scores obtained by the subjects. As stated previously, samples were matched to lessen the effects of confounding variables.

Statistical Design

A two-way analysis of variance (ANOVA) was used to compare the means of the male alcoholic, female alcoholic, male psychiatric, and female psychiatric groups.

CHAPTER 3

RESULTS

A two-way ANOVA was used to analyze the MAC scores of the four groups: male alcoholic, female alcoholic, male psychiatric, and female psychiatric. Thus, the two factors were group identification (independent variable) and MAC score (dependent variable). An ANOVA was used because this study utilized score data. Each cell contained 25 scores.

The overall mean score of all four groups was 24.64 (SD = 4.74). The combined alcoholic groups' mean (M = 25.86, SD = 5.07) differed significantly at the p < .05 level when compared to the combined psychiatric groups' mean (M = 23.42, SD = 4.07). Gender had no significant effect on MAC scores. The overall female mean score of 23.80 (SD = 4.35) and the overall male mean score was 25.48 (SD = 4.99). Table 1 summarizes the results of the ANOVA.

Table 1

ANOVA Summary of Male Alcoholic, Female Alcoholic, Male
Psychiatric, and Female Psychiatric MacAndrew Scales

Source	SS	DF	M	F	p
Diagnosis	148.840	1	148.840	7.140	.009*
Gender	70.560	1	70.560	3.385	.069
Diagnosis & Gender	.360	1	.360	.017	.896
Error	2001.280	96	20.847		
Total	2221.040	99			

* p < .05

The only significant relationship demonstrated was
between the alcoholic and nonalcoholic (control) groups.
The female alcohol dependent group mean was 25.08.
The male alcoholic dependent group mean was 26.64. The
female psychiatric group mean was 22.52. The male
psychiatric group mean was 24.32.

Overall correct classification rates for the
alcoholic groups were 68% and 32% with the cut-off
scores of 24 and 28 respectively. Sixteen (64%) female
alcoholics were correctly identified with a cut-off

score of 24, and five (20%) were correctly identified
with a cut-off score of 28. Eighteen (72%) male
alcoholics were correctly identified with a cut-off
score of 24, and eleven (42%) were correctly identified
with a cut-off score of 28.

Overall correct classification rates for the
non-alcoholic groups were 54% and 84% with the cut-off
scores of 24 and 28 respectively. Ten (40%) female
non-alcoholics were misclassified with a cut-off score
of 24, and two (8%) were misclassified with a cut-off
score of 28. Thirteen (52%) male non-alcoholics were
misclassified with a cut-off score of 24, and six (24%)
were misclassified with a cut-off score of 28.

CHAPTER 4

DISCUSSION

This study was designed to examine the effects of
gender on the MAC's ability to identify alcoholic and
non-alcoholic, psychiatric outpatients. The outpatient
groups were chosen in accordance with MacAndrew's (1965)
use of psychiatric controls in an attempt to prove that
the scale was not a measure of maladjustment. This
study was conducted in response to the lack of research
examining female responses to the MAC.

ANOVA results demonstrated that alcoholics scored
significantly higher than non-alcoholics. However,
examination of the data revealed a numerical difference
of only 2.44. Male alcohol dependents scored 2.32 and
4.12 points higher than the male and female psychiatric
groups respectively. Similarly, female alcoholic
dependents scored .76 and 2.56 points higher than
the male and female psychiatric groups respectively.
Gender had no significant effect on MAC scores. The
tendency for female subjects to score lower than males,
as observed by Johnston (1986) and Svanum, Levitt, and
McAdoo (1982) was replicated in that both female groups

scored an average of 1.68 points lower than the male
groups.

Results advocated caution in using the MAC due to
the similarities observed between the group mean scores
and high rates of false positives and negatives.
According to MacAndrew's (1965) criteria for diagnosis
(cut-off score, 24) three groups would be identified as
alcoholic. While using the suggested cut-off scores of
27 (Schwartz & Graham, 1979) and 28 (Whisler & Cantor,
1966; Woisniewski, Glenwick, & Graham, 1985) no groups
would be identified as alcoholic in this study.

This study demonstrated a diversity of MAC scores
within each of the four groups. Female alcoholic scores
ranged from 15 to 38; male alcoholic scores ranged from
16 to 37. Female psychiatric scores ranged from 16 to
29; male psychiatric scores ranged from 16 to 33.
Overall false positives were 46% with a cut-off score of
24, and 16% with a cut-off score of 28. Overall false
negatives were 32% with a cut-off score of 24, and 68%
with a cut-off score of 28. Results strongly suggest
that the MAC scores should not be considered as single
indicators of alcohol dependency.

The primary limitation of this study was the size
of each sample group (25) which was restricted by the
availability of scores from female alcohol dependent

files. In addition, samples were drawn from the limited
population of a midwestern mental health center. Thus,
generalization would be limited.

The limited amount of MAC research utilizing male
and female subjects have presented conflicting results.
The similarities between the means of the four groups
and high false positive and negative rates raised
questions concerning the strength of the scale as an
alcoholic identification device. If the MAC is to
continue to be used with both genders, more studies of
female responses to the scale are needed. In
particular, further research concerning appropriate
cut-off scores and sensitivity to such variables as
treatment setting (Clopton, 1978; Vega, 1971),
personality traits, demographic information, and
addictive behaviors is warranted.

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