

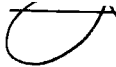
AN ABSTRACT OF THE THESIS OF

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Title: Validation of MMPI Profiles Estimated from CPI Data

Signature redacted for privacy.

Abstract approved:

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Dr. James L. Firth

The purpose of this study was to determine the validity of MMPI scores that were estimated from CPI data. This was later expanded to encompass whether generally low California Psychological Inventory (CPI) t-scores below 25 were predictors of elevated actual Minnesota Multiphasic Personality Inventory (MMPI) profiles.

The sample consisted of 120 alcoholic inpatients at a residential alcohol treatment center during the years of 1986 and 1987. Patients completed the MMPI and CPI within the first week after admission.

Nine hypotheses were tested and three provided positive results. The hypothesis regarding the relationship between the MMPI and the CPI proved there is a relationship and new regression coefficients were calculated. The second finding was that MMPI scores could be estimated accurately from CPI data for alcoholics and that the estimated scores were not significantly different than actual MMPI scores. However, these scores were not exact enough to use for individual diagnoses. Finally, this study found that low CPI profiles with any t-scores below the cutoff score of 25 correlated

with the presence of major psychopathology and actual MMPI profiles were elevated.

Recommendations were that patients in residential alcohol treatment centers complete the CPI within the first week after admission. The CPI results could be used in treatment planning and to determine those individuals that should complete an MMPI later in the program for additional treatment planning and diagnostic interpretation. It was concluded that additional research is needed to determine if these findings apply to the Revised CPI and the anticipated revision of the MMPI.

VALIDATION OF MMPI PROFILES ESTIMATED FROM CPI DATA

by

Charlotte Higgins-Lee

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## TABLE OF CONTENTS

I.	INTRODUCTION	1
	Statement of the Problem	5
	Rationale for the Study	6
	Methodology	9
	Definition of Terms	10
	Research Hypotheses	11
	Summary	12
II.	LITERATURE REVIEW	14
	Overview	14
	Summary	18
III.	RESEARCH DESIGN: METHODS, PROCEDURES AND STATISTICAL TREATMENTS	20
	Research Site	20
	Instrumentation	21
	Sample Size and Selection	23
	Sampling Procedure	24
	Methodology	24
	Statistical Models	29
	Summary	33
IV.	ANALYSIS OF THE DATA	35
	Descriptive Data	35
	Summary of Principal Findings	37
	Summary	48
V.	DISCUSSION	50
	The Samples	51
	Analysis of the Data	52
	REFERENCES	55
	APPENDICES	58

## LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Summary of Descriptive Data for the First Sample	36
2. Summary of Descriptive Data for the Second Sample	36
3. Summary of Data from Statistical Analysis for the First Sample	39
4. New Coefficients for Estimating MMPI Scores from CPI Data	40
5. New Coefficients for Estimating MMPI Scores from CPI Data	41
6. Summary of Data from Statistical Analysis of Actual MMPI Scores and Rodgers' Original Estimated Scores	42
7. Summary of Data from Statistical Analysis of Actual MMPI Scores and Newly Estimated Scores	43
8. Summary of Actual Triatic Codes, Newly Estimated Codes and Goldberg Indexes	44
9. Summary of Low CPI Profiles and Corresponding MMPI Profiles	45

# VALIDATION OF MMPI PROFILES ESTIMATED FROM CPI DATA

## Chapter I

### INTRODUCTION

Personality testing is often an essential part of alcohol treatment programs. The test data are utilized as diagnostic aids and results can be used for treatment planning and program evaluation. The various personality tests that are available are designed for different purposes and several can be administered in a comprehensive assessment program.

The Minnesota Multiphasic Personality Inventory (MMPI) is one of the most widely used personality inventories and is an important research instrument. The MMPI focuses on psychopathology and is used for diagnostic purposes as a predictor of personality traits or states. It has been used for assessment in the field of alcoholism for 30 years. According to Greene (1980), the Minnesota Multiphasic Personality Inventory is currently the most widely used and researched objective personality inventory. Dahlstrom, Welsh, and Dahlstrom (1975) include almost 6,000 references on the clinical and research applications of the MMPI in An MMPI Handbook. Burros' (1978) Eighth Mental Measurements Yearbook contains more than 5,000 citations on the MMPI. Starke Hathaway and J. C. McKinley worked on the development of the MMPI for approximately ten years before it was published in 1940. They wanted to construct a personality inventory that would overcome the problems of earlier personality inventories so they constructed

a large pool of more than 1,000 items that included information from psychiatric textbooks, personality tests and empirical observations. Finally, the MMPI came to be made up of three validity scales and ten clinical scales scored from 566 items. Over the years additional clinical scales have been developed that can be scored from the 566 item group form test booklet. Triatic codes have been developed for sophisticated interpretations of personality disorders. Short-forms of the MMPI have been developed, but there are some questions about the use of these substitutes.

The California Psychological Inventory (CPI) is newer than the MMPI and is considered benign when compared to the MMPI. The CPI was developed by Harrison Gough and published in 1957. Since the MMPI does not provide information useful in treatment planning for individuals who do not have pronounced disturbances, the CPI can be useful in providing easily-understood measures of socially desirable behavioral tendencies. The general purpose of the 480 item CPI is to predict behavior and competence within the context of everyday activities; it provides a better description of the normal personality than the MMPI. The 18 scales of the CPI reveal tendencies such as poise, self-assurance, interpersonal adequacy, socialization and responsibility. The CPI has been used as a personality test for counseling situations involving adults and adolescents.

The CPI can be utilized for treatment planning for alcoholic patients because it is easily understood and measures socially



desirable tendencies. It can be very useful to have information on an individual's responsibility, self-control, socialization, etc. The CPI is quite valid in areas such as socialization according to Megargee (1972). Megargee also concludes the "CPI has been found capable of making long-range predictions sometimes over a period of three or four years and the associates are statistically significant" (1972, p.248). On the other hand, the MMPI is not always important in treatment planning, but it may be necessary occasionally to make an accurate diagnosis if psychopathology is present. For example, medication may be needed by psychotic patients.

Time is a problem if information is needed from both inventories since it usually takes over four hours to complete both inventories. Some people have difficulty completing four hours of testing and this is especially true if a person does not feel well. Therefore, if accurate MMPI profiles could be estimated from CPI data for alcoholic subjects, they would not be subjected to several additional hours of testing. Of if there were a procedure for evaluating the CPI as a predictor of those individuals who need to take the MMPI, it could be administered only to individuals whose profiles are needed for diagnostic purposes. This would establish that the CPI should be administered first.

According to Rodgers, "from 22% to 60% of the items in each of the MMPI scales is included in identical or nearly identical form in the overlapping pool of items appearing on the CPI" (1964, p.2). While at the Scripps Clinic in California, Rodgers originally conducted longitudinal studies of the psychosocial effects of

vasectomy and found that he needed a satisfactory estimator of the MMPI profiles but had only CPI data. To solve this problem, Rodgers used regression analysis to develop conversion weights or coefficients to estimate MMPI profiles. Later the conversion weights were cross-validated on three groups. These three groups were additional Scripps Clinic patients, college students and patients of a neuropsychiatric hospital. This information and coefficients are available in an extended report of the study (Rodgers, 1964).

This research revealed:

The estimated mean profiles closely duplicated the actual means in the neurotic groups, slightly overestimated the pathology in the normal sample and slightly underestimated the pathology in the predominantly psychotic sample. Within these limitations, the estimated MMPI's provided useful measures of psychopathology from the CPI data alone (Rodgers, 1966, p. 89).

If it is possible to substantiate further that the CPI data can be used to estimate accurately MMPI profiles, the use of the CPI can be expanded. However, it will be necessary to have more accurate estimates of profiles for various groups if there is sometimes slightly overestimated psychopathology and sometimes underestimated psychopathology. Since the CPI is a more benign test, the results may be more easily obtained for special groups. One special group that tends to be difficult to test because of the resistance that is inherent in their psychopathology, is alcoholics.

A thorough literature review has revealed that in the field of alcoholism, research on the differences between men and women of different ages has been sparse. It has also be recognized that

sufficient research is lacking on the differences in motivation between volunteers and coerced patients.

#### Statement of the Problem

The following questions are addressed for this thesis:

- a. Is it possible to use CPI data to accurately estimate MMPI raw scores for alcoholics?
- b. How well do estimates made with Rodgers' coefficients compare to actual MMPI profiles for groups that differ in gender, age and motivation.
- c. Is it possible to make more accurate estimations if new coefficients are computed for male and female alcoholics of differing ages and motivation?
- d. Is it possible to use a generally low CPI with t-scores below 25 to predict which individuals should complete an MMPI?

The MMPI and the CPI are both recognized personality inventories that can be utilized in alcohol treatment programs. Current research on estimating MMPI profiles from CPI data for alcoholic groups is unavailable, but needed to determine the validity of estimated MMPI profiles for alcoholic patients. For treatment planning and program evaluation purposes, it is often useful to know the information provided by both the MMPI and the CPI. However, the combined length of these two tests results in a time demand for test completion that is prohibitive for many individuals. Thus, accurate estimates of MMPI profiles from CPI data would be very useful.

## Rationale for the Study

Research attempts to estimate MMPI profiles from CPI data have resulted in profiles that were similar but not accurate enough to make assessments for individuals. Additional research is needed with test scores of diverse groups, including alcoholics, to establish the validity of MMPI scores estimated from CPI data since MMPI test result interpretations are only useful for research purposes. Rodgers stated "in a longitudinal study assessing psychosocial effects of contraceptive procedures, the CPI variables were considered more specifically relevant than those commonly assessed by the MMPI, but some assessment of the MMPI variables was nevertheless desired" (1966, p. 89).

It has been established that the CPI is valid in specialized areas such as substance abuse. According to Canter (1963), the CPI scales relating to sense of well being, responsibility, tolerance or acceptance of others, maturity, ego-stability, and achievement aspirations were especially pertinent to alcohol research with the CPI.

The Well-Being (Wb) scale is a validity scale. Alcohol research studies using the CPI have revealed that the t-score for Wb is well below 44 for untreated alcoholics.

Responsibility (Re), Socialization (So), and Self-Control (Sc) are scales that have been used in alcohol and substance abuse studies since many abusers are considered "rebellious" or "anti-social."

Tolerance (To) scale is a scale that reflects openness and flexibility. This scale has been used in alcohol studies since many

alcoholics are intolerant of others.

Research by Canter (1963) established that low CPI profiles were achieved by 15 poorly adjusted and 15 better adjusted alcoholics achieved higher CPI profiles. Corotto (1963) reported similar mean profiles for alcoholic patients. There may be parallels between poorly adjusted and better adjusted alcoholics and neurotic, normal and psychotic individuals. Megargee (1972) reported that because an upward change in scores indicates a better adjustment, significant gains in treatment can be measured on the CPI for people who are socially maladjusted.

According to Megargee (1972), the mean profiles of the samples of alcoholic patients are quite similar and patterns resemble those of other socially deviant groups, with a generally low profile. Therefore, a lowered CPI profile that may indicate an individual is poorly adjusted may also indicate that the MMPI profile would describe a neurotic or psychotic individual. An estimated MMPI profile from CPI data could be used to determine if an individual should complete an MMPI for additional information.

Although the MMPI has been used for assessment and treatment of alcoholism for more than 30 years, recent investigations have addressed the effects of variables such as gender, age and motivation. Snyder, Kline and Podany state "although few investigations have empirically examined the differential validity of (MMPI) substance abuse scales, even fewer have studied the effects of race and sex bias on these scales' predictive accuracy" (1985, p. 521). Therefore, additional research may be useful in the investigation of the effects

of these and other variables.

In 1981, the National Institute of Alcohol Abuse and Alcoholism (NIAAA) launched a major publicity campaign to emphasize the special needs and concerns of women affected by alcoholism. According to Homiller (1977), there is a need for consideration of sex differences among substance abusers because the proportion of men and women substance abusers seeking treatment is rapidly changing and our present information is based on old data.

It is generally accepted that alcoholic individuals or substance abusers under the age of 40 are often different from their older counterparts, but there is little research to support this. The length of time that the individuals use or abuse prior to having legal, social or personal problems is often shorter for younger individuals. Also, younger alcoholic individuals are usually abusive of multiple substances and are affected differently and more intensely than older individuals.

Recent MMPI research documents the importance of the individual's purpose in seeking treatment. In a report on volunteer and non-volunteer heroin patients in a Veterans' Administration Hospital, Penk stated:

The purpose or motivation often influences the outcome of the program. MMPI profiles of those seeking treatment on their own volition often differ from profiles of those seeking treatment because they have been coerced to contact the clinician by friends, family or legal authorities (1975, p. 98).

It is vital that research efforts continue to substantiate whether there are differences among alcoholics of different ages,

gender and motivation. If there are differences, different coefficients may be necessary to estimate MMPI profiles from CPI data for alcoholic men of different ages and women of different ages. There may also be differences between men and women who are coerced and those who are volunteers in treatment programs. Therefore, research in this field with the CPI to estimate the MMPI needs to include these variables.

The results of this study may be useful in the field of alcoholism. While the MMPI provides information mainly on psychopathology, the CPI provides information that may be used for assessment and treatment planning. Research is also needed to provide a basis for administering the CPI first for assessment and treatment planning and only administering the MMPI if the CPI data indicates a need for further testing. If generally lowered CPI profiles are present or if estimated MMPI profiles indicate possible psychopathology, then the MMPI could be administered later.

#### Methodology

The subjects of this study were alcoholic patients admitted to White Oaks Residential Center in Salem, Oregon, between June 4, 1986, and March 30, 1987. The CPI and the MMPI were administered during the first two weeks after admission.

Invalid MMPI profiles were sorted out according to the F-K index (Butcher, 1978, p. 283). CPI profiles were checked for validity according to the three validity scales: Good Impression (Gi), Communality (Cm) and Well Being (Wb).

After the invalid tests were sorted out, statistical analysis was utilized to test for significant differences between estimated and actual MMPI scores before and after new regression equations were computed for eight groups of alcoholics. Finally, estimated MMPI profiles were compared to actual MMPI profiles to determine relationships and changes.

#### Definitions of Terms

The following terms commonly used throughout the course of this study will be defined:

**Actual Profiles:** Personality profiles determined by actual raw test scores for the MMPI.

**Alcoholic Patient:** A person who has been admitted to a residential alcoholic treatment center for detoxification.

**CPI:** A 480 item personality inventory published by Harrison Gough in 1957.

**Coerced Individual:** A person required by the judicial system, state agency or employer to participate in an alcohol treatment program.

**Estimated Profile:** Personality profile computed from regression coefficients to estimate actual personality profile.

**Goldberg Index:** A formula ( $L + Pa + Sc - Hy - Pt$ ) derived by L. R. Goldberg for use with the MMPI to identify psychotic individuals.

Goldberg suggested a cutoff score of 45 but encouraged researchers to empirically establish cutoffs for new research.

**K-correction:** A method of adding points to certain MMPI scales.



MMPI: A 566 item personality inventory by Hathaway and McKinley, published in 1940.

Program Evaluation: A method of evaluating the efficiency and effectiveness of a treatment program.

T-score: A score equivalent to a raw score that is obtained with the following formula:  $T = 50 + 10 \left( \frac{X - M}{SD} \right)$

where

X = the client's raw score

M = the mean score on the scale

SD = the standard deviation

Triatic Code: A method of combining numbers of MMPI scales to describe personalities.

Volunteer: An individual that participated in an alcohol treatment program of his free will.

### Research Hypotheses

There are nine primary null hypotheses in this study:

Ho<sub>1</sub>: There is no significant difference between actual MMPI profiles and MMPI profiles estimated through the use of Rodgers' regression formula for the first sample.

Ho<sub>2</sub>: There is no relationship between the MMPI and the CPI.

Ho<sub>3</sub>: There is no significant difference between actual MMPI profiles and Rodgers' original profiles for the second sample.

Ho<sub>4</sub>: There is no significant difference between actual MMPI profiles and MMPI profiles estimated through the use of new regression formulae that include gender, age and motivation variables.

Ho<sub>5</sub>: There is no relationship between a low CPI profile with t-scores below 25 and neurotic, psychotic and psychopathic groups.

Ho<sub>6</sub>: The estimated profiles of the neurotic group are not greater than the actual profiles as measured by the standard deviation for each scale.

Ho<sub>7</sub>: The estimated profiles of the normal group are not greater than the actual profiles as measured by the standard deviation for each scale.

Ho<sub>8</sub>: The estimated profiles of the psychotic group are not greater than the actual profiles as measured by the standard deviation for each group.

Ho<sub>9</sub>: The estimated profiles of the psychopathic group are not greater than the actual profiles as measured by the standard deviation for each group.

#### Summary

Earlier research on estimating MMPI profiles from CPI data (Dahlstrom and Welsh, 1960; Rodgers, 1966; Megargee, 1966; Shusman and Inwald, 1987) has been based on a variety of groups of people, i.e. male vasectomy patients, college students, psychiatric hospital patients and police officer candidates. The original regression coefficients that Rodgers developed were used to estimate MMPI profiles for men and women of various groups. Only the MF scale on the MMPI had separate coefficients. The conclusions drawn from Rodgers' research are that the estimated profiles are useful for research purposes but should not be used for making individual diagnoses. The same conclusions were reached by other

researchers that attempted to estimate MMPI profiles for various groups of people.

Since earlier studies did not involve test data of alcoholic subjects to calculate regression coefficients, it was hypothesized that regression coefficients obtained from data on male and female alcoholics, under and over the age of 40 with either volunteer or coerced status, would result in more accurate MMPI profiles. It was also hypothesized that generally low CPI profiles could be interpreted as an indication of individuals who need to complete an actual MMPI since they could be expected to have elevated MMPI profiles.

This introductory chapter also included a brief explanation of the methodology and sample size as well as definitions of terms used in this study.

## Chapter II

### LITERATURE REVIEW

Chapter two reviews the literature related to estimating MMPI profiles from CPI data, and the implications for further testing when a generally lowered CPI profile is identified.

Prior to efforts to estimate MMPI profiles from CPI data, there were efforts to estimate CPI profiles from MMPI data by Dahlstrom and Welsh in 1960 according to Rodgers (1964).

David A. Rodgers published "Estimation of MMPI Profiles from CPI Data" in the Journal of Consulting Psychology in 1966. This report on several years of research revealed that correlations between estimated and actual MMPI scale scores closely approached test-retest reliability. It was reported that estimated mean profiles closely duplicated the actual means in the neurotic groups. However, the estimated profiles slightly over or underestimated the pathology of normal or psychotic samples respectively. Also, in 1966, Edwin Megargee reported on research with the MMPI and CPI. Both inventories were given to 105 college students and identical items were used for an abbreviated version and prorated to estimate the full CPI scale score. Megargee concluded "the results indicate that it might not be advisable to estimate CPI scores from MMPI data where individual diagnosis is concerned but might be applicable in group situations" (p. 456-458). Shusman and Inwald (1987) developed equations for estimating MMPI scores from randomly selected samples of 382 male and 119 female correction officer candidates

and they cross-validated their research with 237 randomly-selected males and 78 females. They found that the scores were not consistently accurate predictors of actual scores. They also concluded that simple regression analyses failed to support the use of the CPI to predict MMPI scale scores in both initial and cross-validation samples.

Tarter (1975) reported on research with the CPI that involved 48 alcoholics with a mean age of 44.4 years. Their scores were compared with those of 24 normals with a mean age of 43.3 years. It was found that there were differences between the two groups on the socialization and self-control scales. It was also found that there were differences between early and late onset drinkers (before or after the age of 30) on several measures (e.g., flexibility social pressure and achievement via independence scales).

In 1980, Shut, Hutzell, Swint and Gaston published "CPI Short-form Incorporating MMPI Shared Items, Construction, Cross Validation Comparison" in the Journal of Clinical Psychology. They developed cross-validated and compared a CPI short-form that consisted of those CPI items repeated from the MMPI plus additional CPI items with a short-form. It was concluded that further assessment of a CPI short-form that is simultaneously an MMPI short-form appears justified, but that the estimates of the MMPI should be used for research purposes.

Short-forms of the MMPI have been constructed and are published, but Graham and Greene, two leading authorities on the MMPI do not recommend using them. Greene (1980) reported that there are a

number of short forms including the Form R, which has been shortened to 399 items, but research on short forms yielded mixed results. Other short forms are even shorter than the Form R. He also pointed out that problems multiply when other short forms are used since there are fewer items that are scored.

Methods of using the MMPI and the CPI in tandem were suggested in an article by Burger and Collins (1982-83). They also explored methods of predicting the profiles of one inventory from the other. They concluded:

Potentially important differences between individuals categorized into a particular MMPI type can be noted by classifying them into one of the CPI types. Thus, one test can be used to identify subtypes determined from the other test. For example, MMPI profiles classified into the psychotic type can be further subdivided into the CPI anti-social or neurotic types (p. 285).

Rennie (1953) reported in a 20-year follow-up study of 200 neurotic patients that approximately 14 per cent of the initially diagnosed neurotics were later classified as psychotic.

Forgac and Michaels (1982) reported on research with the MMPI and CPI. They had hypothesized that male exhibitionists without other criminal involvement have different personality characteristics than male exhibitionists with criminal involvement. They found that the criminal type exhibits greater pathology and sociopathy. Their research used the Goldberg Index for differentiating normal from deviant and psychiatric from sociopathic MMPI group profiles. The research revealed that the criminal group had greater elevations on the MMPI psychopathic deviate and schizophrenia scales than the

non-criminal group and lower elevations on the CPI's responsibility and socialization scales than the non-criminal group.

Lanyon and Goodstein in *Personality Assessment* (1971) reviewed the instruments for personality assessment. They cited the need for more research for both the CPI and comparable tests to identify useful correlates of different profile types. They also stressed a need for studies comparing the predictive validities of the various tests. According to Megargee (1972) a few investigators notably Goodstein, Crites, Heilbrun and Remple have performed more sophisticated statistical comparisons of profile shape and interaction patterns than most CPI research that has been completed. Megargee indicated that the majority of CPI research involves means and comparisons of profiles and additional sophisticated research is needed.

Megargee (1972) also states, the entire CPI profile tends to be lower for alcoholic patients. Research by Gregory and Morris (1978) reported that their results tend to confirm the concurrent validity of the CPI scales. They also reported, "It is concluded that low scores on CPI scales appear to reflect general maladjustment rather than indicating the polar opposite of high scores" (1978, p. 264).

Canter (1963) has become a major researcher with the CPI in alcoholism studies. One study of the relationship between ability to present a good picture on the CPI and actual life adjustment of alcoholic patients concluded that the capacity to "fake good" may be a personality variable of considerable importance. It was concluded that the ability to "fake good" might be a manifestation of an

actual potential to improve. The results showed that even under "fake good" instructions the better adjusted alcoholics showed more improvement than poorer adjusted alcoholics had consistently lower CPI profiles and less ability to achieve higher profiles even when instructed to "fake good."

McGinnis and Ryan (1965) reported there have been conflicting results regarding the elevation of MMPI scale scores in older age groups and that none of these studies have dealt with specific diagnostic groups such as older individuals. Their study investigated the effects of age on MMPI scores for different age groups of hospitalized chronic male alcoholics. They found six clinical scales and one validity scale decreased significantly after the 30 to 39 age level. According to Butcher (1979), there have been only three additional MMPI studies involving age and alcohol.

#### Summary

The literature review revealed that it has not been possible to estimate accurately MMPI profiles from CPI data for individual assessment. According to Rodgers (1966), the estimated profiles are close only for neurotic groups, but not for normal or psychotic groups. Rodgers concluded that the profiles are useful only for research purposes.

Megargee (1966) and Shusman and Inwald (1987) have also concluded from research to determine if MMPI profiles can be estimated from CPI data that the profiles are useful only for research purposes. All of this earlier research was with a variety of



populations that did not include alcoholics. Also, earlier research on estimating MMPI profiles did not include the variables of gender, age and motivation.

There are only four major studies of age and alcoholism with the MMPI and a careful review of the literature revealed none with the CPI. There are no studies estimating profiles from CPI data for alcoholic patients that include the variables of gender, age and motivation.

The review of research articles point to the lack of investigations using personality inventories to obtain research data on women alcoholics. Literature related to patient motivation indicates that there are differences in the rates of recovery or improvement for individuals depending on their motivation as voluntary or coerced patients. The implications are that additional research is needed on estimating MMPI profiles from CPI data for men and women alcoholics and effects of age and motivation.

## Chapter III

### RESEARCH DESIGN: METHODS, PROCEDURES AND STATISTICAL TREATMENTS

The first half of this chapter deals with research methods and procedures, and examines the following:

Research Site

Instrumentation

Sample Size and Selection

Sampling Procedures

Methodology

The second half of this chapter deals with the statistical design and treatment of the data. The variety of research objectives, hypotheses and statistical approaches have been organized as follows:

Statistical Models

Descriptive Data

#### Research Site

Research at White Oaks Residential Alcohol Treatment Center in Salem, Oregon, was initiated in June 1986. This center provides a 30-day live-in treatment program for both men and women. To enter this program, the primary presenting problem must be alcoholism. A one-week period of abstinence or detoxification is required before admission to this residential treatment center. Additional admission requirements are the intellectual ability to participate in educational group sessions and a minimum age of 18 years.

## Instrumentation

The California Psychological Inventory (CPI) by Gough is a 480 item true-false questionnaire for use with normal individuals. It provides 18 scales measuring easily understood and socially desirable behavioral tendencies such as poise, self-assurance, interpersonal adequacy, socialization, responsibility, achievement potential and intellectual efficiency. According to the Manual for the CPI, reliability studies using the test-retest method established that all the scales have satisfactory reliability and validity of the scales has also been established. Each scale has been repeatedly cross-validated and the test contains three internal checks on the validity of responses to guard against misrepresentation. Finally, the CPI has wide-spread acceptance as the test of choice in counseling and assessment situations involving adults and adolescents according to Megargee (1972).

Megargee (1972) states:

There is a strong tendency for different groups of disturbed individuals, whose life styles are ineffective, to look alike on the CPI, whether the label applied to their specific disorder is anxiety reaction, phobic reaction, alcoholism, inadequate personality or whatever (p. 210).

Megargee goes on to point out that the alcoholism syndrome is quite heterogeneous. "The one thing that all alcoholics have in common is that they drink more than someone thinks they should." "Alcoholics can come from all races, religions and ranks of society" (p. 210). Therefore, the CPI can be utilized in alcohol treatment programs for the wide range of personality types that may be found

among patients.

There are certain CPI scales that are especially sensitive to adjustment of alcoholics. The Well-being (Wb) scale, Responsibility (Re), Socialization (So), Self-Control (Sc), and Tolerance (To) scales are usually very low for alcoholics. The Communality (Cm) scale usually distinguishes alcoholics' profiles from those of other psychiatric patients since alcoholics tend to have normal Communality scores.

Hogan, Mankin, Conway, and Fox (1970) used the CPI for research with undergraduates who were marijuana users. They found that significant differences were found on ten CPI scales. Re, So, and Sc were especially low for marijuana users. The scales that are especially sensitive for substance abuse can provide useful information in treatment programs since treatment objectives such as responsibility, socialization and self-control can be incorporated into therapy. Actually, these objectives are usually components of therapy and the CPI can be used for pre and post-testing to measure better adjustment.

The MMPI is a much older test than the CPI and the development of the MMPI in 1940 by Hathaway and McKinley represents a major landmark in personality inventories since it can reliably be used for diagnostic purposes. The MMPI is the best known psychological inventory in use. The reliability for the MMPI is satisfactory for all 13 scales according to the Manual for the MMPI. Reliability coefficients are reported in the Manual. The Manual also reports

that validity is satisfactory since a high score on a scale has been found to predict estimates of clinical diagnoses as often as 60 per cent of the time. Since some alcoholic patients also have personality disturbances, there are times when the MMPI is useful in making dual diagnoses and developing treatment plans.

For some individuals, information from the CPI and the MMPI is needed. Since it has been estimated that from 22% to 60% of the items in each of the MMPI scales is included in identical or nearly identical form in the overlapping pool of items appearing on the CPI (Rodgers, 1966), researchers have attempted to compute regression equations to estimate MMPI profiles from CPI data and vice versa.

#### Sample Size and Selection

The California Psychological Inventory (CPI) and the Minnesota Multiphasic Personality Inventory (MMPI) were administered to 120 newly admitted patients within two weeks of admission to the program. The research design required two separate samples. The first sample of 80 sets of tests was used to determine if there were significant differences between Rodgers' coefficients and actual MMPI scores and then to develop new regression coefficients. The second sample was used to test the new coefficients for accuracy with an independent sample and to determine if generally low CPI profiles predicted elevated MMPI profiles. The second sample was also used to determine if estimated profiles were over or under estimations of psychopathology.

## Sampling Procedure

The subjects of the study were the patients admitted to White Oaks Residential Center between June 4, 1986, and March 31, 1987. Each individual completed a questionnaire that gave specific personal information on age, gender, and motivation for entering the program. Testing continued until 120 individuals had completed both tests. The research design specified that individuals must complete both tests, so there were individuals that were not included in the study since they completed portions of the tests or only one test.

The CPI and the MMPI were completed on separate days, a week apart, but within the first two weeks after admission to the residential alcohol treatment program. The majority completed the CPI the first week and the MMPI the second week, but ten completed the MMPI the first week and the CPI the second week. Generally, each test was completed at one sitting, but a few individuals could not complete an entire test in one afternoon and were allowed to finish the following day. A few individuals could not read well enough to independently complete the tests, so they were administered orally to those people.

## Methodology

The MMPI's and CPI's were scored by standard templates. Templates for hand scoring MMPI items from CPI data are not available, so templates were made using the lists of MMPI items in the CPI for each scale according to the lists Megargee (1972) included in the

appendices of his book. The hand-made templates were used to score the MMPI items in the CPI for the estimated MMPI profiles. The same procedure was followed for the second set of 40 tests. Finally, every tenth set of tests was double checked to determine if there were any scoring errors.

Invalid MMPI profiles were sorted out according to the F-K index (Butcher, 1978, p. 283). Six sets of tests were discarded from the first sample of 80, leaving 74 sets of tests. Nine sets of tests were discarded from the second sample of 40 leaving 31 sets of tests. After the MMPI item scores were obtained from the CPI's, Rodgers' 1966 coefficients were used to calculate weighted MMPI scores. The weighted or estimated MMPI raw scores for the three validity scales and the ten clinical scales were used without the K correction for statistical analyses. Throughout the statistical analyses, the thirteen scales (three validity scales and ten clinical scales) were treated separately since it is not possible to obtain composite scores for the MMPI or CPI.

CPI profiles were checked for validity according to the three validity scales: Good Impression (Gi), Communality (Cm) and Well Being (Wb). It was determined that there were no scales where Gi exceeded a t-score of 70 which has been established as a cutoff score. It was also determined that none of the t-scores on Cm were below 15, the cutoff score for that scale. However, approximately 40 per cent of the t-scores for Wb were below the cutoff of 30. The Wb scale is especially sensitive to alcoholics and other maladjusted persons so this could be expected. Low scores on Wb

are actually part of the hypotheses for this study since generally low t-scores (below 25) on the CPI are an indication of psychopathology. The low t-scores on the CPI Wb scale were consistent and the number (40%) was very large, which indicates these scores are valid for this population. According to Gough, "Psychiatrically ill persons score below average on Wb, as they ought" (1957, p. 16). Therefore, none of the CPI tests were discarded.

Gregory and Morris (1978) conducted research with the CPI and reported that 11 of their 95 college subjects had a t-score below 30 on the Well Being (Wb) scale and they retained their tests for statistical analysis because "brief interviews indicated that this was the result of an overemphasis upon worries and problems rather than overt "fake bad" orientation" (p. 259). Their subjects did not have any t-scores above 70 for the Gi scale or below 30 on the Cm scale. This research supports the retention of those tests with low t-scores for Wb, since the patients in White Oaks were often experiencing strong emotions without the sedative affect of alcohol or drugs.

After the invalid MMPI tests were discarded from the first sample of 80 cases, the remaining 74 sets were used in statistical analysis to determine if there was a significant difference between actual MMPI scores and MMPI scores estimated with Rodgers' coefficients. None of the three validity scales or ten clinical scales included K corrections.

The actual MMPI scale raw scores and scores estimated for the MMPI with Rodgers' coefficients were analyzed using the paired t test.



Because there were significant differences between actual and estimated MMPI scores, the 74 sets were used to develop new regression coefficients for eight groups (male alcoholics 39 and under who volunteered for treatment, male alcoholics 39 and under who were forced into treatment, male alcoholics 40 and over who volunteered for treatment, male alcoholics 40 and over who were forced into treatment, female alcoholics 39 and under who volunteered for treatment and female alcoholics 39 and under who were forced into treatment, female alcoholics 40 and over who volunteered for treatment and female alcoholics 40 and over who were forced into treatment.) There were not sufficient numbers of male and female alcoholics 40 and over to compute adequate coefficients for those groups so those tests were discarded.

After the invalid MMPI tests and those of individuals 40 and over were discarded from the second 40 sets of male and female alcoholics, the remaining 31 cases were used to test the new regression coefficients for significant differences. Again, a paired t test was used to analyze the data.

The actual MMPI profiles for the second set of 31 profiles were then compared with the profiles estimated from the new regression coefficients to determine if there were significant differences.

The question of the use of the lowered CPI profile as an indicator of neurosis or psychosis was analyzed by comparing estimated and actual MMPI profiles to determine if a CPI profile with

any t-scores below 25 predicted an elevated MMPI profile. The sets of tests were first sorted into two groups of low CPI profiles with any t-scores below 25 and CPI profiles with no t-scores below 25. T-scores of 25 were empirically selected as the optimal cutoff level. Then the sets of tests were further divided according to neurotic, normal and psychotic. Psychopathic profiles became a fourth group. To validate the designation of psychotic or non-psychotic profiles, the Goldberg Index was used to provide another cutoff level. Goldberg (1965) determined that the following formula,  $L + Pa + Sc - Hy - Pt$ , could be used by inserting t-scores and resulted in a cutoff score to classify profiles as psychotic or nonpsychotic. He stated "Obviously, the clinician who uses this index in clinical work should determine empirically the optimal cutoff scores for each setting in which the index is used" (1965, p. 45). By comparing psychotic profiles with t-scores of 80 or above, an optimal cutoff Goldberg Index of 70 was established.

Finally, newly estimated MMPI profiles were charted on the same profile sheet as actual MMPI profiles and differences on each scale were subtracted from the standard deviation for each scale to determine if there were significant differences. This procedure revealed whether there were tendencies of estimated profiles to duplicate the actual scores in the neurotic group, slightly overestimate and slightly underestimate the pathology in the normal and psychotic samples.

## Statistical Models

The paired t test was used to test hypotheses because the data are intrinsically paired for comparison. In Statistical Methods, Snedecor and Cochran (1980) state "self pairing is highly effective when an individual's performance is consistent on different occasions but even more so when comparisons are made from one individual to another" (p. 89).

The statistical model for the paired t test method is:

$$D_i = \mu + e_i$$

where,

$D_i = Y_{1i} - Y_{2i}$  is the observed difference on the  $i$ th pair,

$\mu = \mu_1 - \mu_2$  is the difference of the two population means and  $e_i$  is a random error.

Within a category, a paired t test is used to test  $H: \mu = 0$ .

Regression analysis was used to estimate or predict MMPI scores because as Courtney stated, "The regression equation enables us to do this kind of prediction" (1983, p. 273). Regression equations were calculated for estimating MMPI scores from CPI data. The MMPI scores ( $M_{ij}$ ) were regressed on the CPI scores ( $C_{ij}$ ), gender and motivation. New coefficients were obtained for men and women who were under 40 and volunteers and coerced individuals in alcohol programs.

The statistical model for simple regression is:

$$Y_i = a + b x_i + e_i$$

where,

$Y_i$  = the  $i$ th observation of the dependent variable

$x_i$  = the  $i$ th observation of the independent variable

$a$  = the intercept constant

$b$  = the regression coefficient

$e_i$  = random error

The data were prepared for and analyzed by the Cyber using Statistical Package for the Social Sciences (SPSS). Data analysis involved a number of steps that required the paired to test and regression analysis. The following objectives evolved:

#### Descriptive Data

Objective I: Determine if there were differences between actual MMPI profiles of alcoholics and profiles estimated through the use of Rodgers' regression coefficients. This objective used the first 74 sets of tests.

The following hypothesis was tested:

$H_0$ : There is no significant difference between actual MMPI profiles and MMPI profiles estimated through the use of Rodgers' original regression formula.

Objective II: Calculate new regression analysis coefficients for four categories of groups differentiated by gender and motivation.

The following null hypothesis was tested:

$H_0$ : There is no relationship between the MMPI and the CPI.

Since there were significant differences in estimated scores with Rodgers' coefficients on five scales, L, K, MF, Ma and Si, regression analysis was utilized to compute new coefficients for categories based on age, gender and motivation.

Objective III: Determine if the actual MMPI profiles of the second sample were significantly different than the estimated MMPI profiles using (1) Rodgers' 1966 coefficients and (2) the newly estimated coefficients.

The following null hypotheses were tested:

Ho: There is no significant difference between actual MMPI profiles and Rodgers' original profiles.

Ho: There is no significant difference between actual MMPI profiles and new estimated profiles.

Objective IV: Determine if a general lowering of the overall CPI profiles was found for neurotic, psychopathic and psychotic groups. The 31 sets of tests from the second sample were sorted according to whether there were any CPI t-scores of less than 25 on each profile. The CPI profiles were then compared to MMPI profiles to determine predictability of psychopathology.

The following null hypothesis was tested:

Ho: There is no relationship between a low CPI profile with t-scores below 25 and neurotic, psychotic and psychopathic groups.

Objective V: This objective was to determine if the actual MMPI profiles of the second sample closely duplicated (less than one standard deviation difference) the actual means in the neurotic groups, slightly overestimated (less than one standard deviation difference) the pathology in the normal sample and slightly underestimated (less than one standard deviation difference) the pathology in the predominantly psychotic sample. This required a comparison of actual MMPI profiles to new estimated profiles on the same profile sheet. T-scores  $> 80$  and the Goldberg Index (Goldberg, 1965) were used to identify psychotic profiles. As Goldberg recommended, optimal cutoff scores were determined empirically for this sample. The following null hypotheses developed:

- Ho: The estimated profiles of the neurotic group are not greater than the actual profiles as measured by the standard deviation for each scale.
- Ho: The estimated profiles of the normal group are not greater than the actual profiles as measured by the standard deviation for each scale.
- Ho: The estimated profiles of the psychotic group are not greater than the actual profiles as measured by the standard deviation for each scale.
- Ho: The estimated profiles of the psychopathic group are not greater than the actual profiles as measured by the standard deviation for each scale.

### Summary

In the first part of the chapter, research design, methods and procedures were examined briefly. The research site, sample size, selection and sampling procedures are all straight forward and require no extensive explanations. The California Psychological Inventory (CPI) and the Minnesota Multiphasic Personality Inventory (MMPI) are recognized tests that do not require detailed support.

The procedural and statistical treatment of the data was reviewed in the second part of this chapter. This information is broken down into objectives and required more explanation. Special care was taken to explain how preliminary test data of 74 newly admitted residential alcoholic subjects was used to determine if accurate MMPI raw scores (without K corrections) from corresponding CPI scales could be estimated for alcoholic subjects. The following formula from Rodgers' 1966 research was used:  $Y = aX + b$ , where Y equals estimated MMPI raw score and X equals score on estimated CPI scales and a and b represent constants for each scale. Since the estimated MMPI raw scores were not accurate when compared to actual MMPI raw scores of the same subjects, regression analysis was used to establish accurate formulas for estimating MMPI raw scores for alcoholics according to age, gender and motivation.

Finally, the CPI data from 31 additional alcoholic residents are used with the adjusted formula to confirm the validity of the new estimated MMPI profiles. Then the low CPI profiles were compared with elevated MMPI profiles to determine predictability of low

CPI's. The concluding step was again to compare profiles to determine if newly estimated profiles for neurotics closely duplicated actual MMPI profiles and if the psychopathology for normal profiles was overestimated while psychopathology for psychotic groups was underestimated.



## Chapter IV

### ANALYSIS OF THE DATA

The primary problem of this study was to determine if CPI data could be used to estimate MMPI raw scores accurately for male and female alcoholics of different ages and motivations. The problem was expanded to encompass whether generally low CPI scores were predictors of elevated actual MMPI scores.

This chapter reports on the statistical analyses of the test data, California Psychological Inventory and Minnesota Multiphasic Personality Inventory, completed by more than 120 individuals newly admitted to White Oaks Residential Alcohol Treatment Program in Salem, Oregon. The 120 sets of data were divided into two samples for statistical analyses.

The findings are provided in four sections since different statistical procedures were used to process the data. The four sections are: (1) descriptive data; (2) findings related to objectives 1 and 2; (3) findings related to objective 3; (4) findings related to objectives 4 and 5.

#### Descriptive Data

Responses to the items on the questionnaire each person completed are summarized in this section. The information is separated into two sections since two separate samples were necessary for the research design. There are 74 sets of data in the first sample (80 minus 6 invalid profiles) and 31 sets

in the second sample (40 minus 9 invalid or over age 40 profiles). The research design called for information on age, gender and motivation (volunteer or coerced). The data for the first sample are presented in Table 1. The data for the second sample are presented in Table 2.

---

Table 1  
Summary of Descriptive Data for First Sample:  
N = 74

---

	Men	Women
39 and Under		
Coerced	21	5
Volunteered	16	19
40 and Over		
Coerced	6	0
Volunteered	4	3

---

Table 2  
Summary of Descriptive Data for Second Sample  
N = 31

---

	Men	Women
39 and Under		
Coerced	14	4
Volunteered	7	6

---

### Summary of Principal Findings

Age: Of the first set of valid data for 74 individuals who completed both tests, 61 (82%) were 39 years old or younger and 13 (18%) were 40 years of age or older. Of the second set of valid data for 37 individuals who completed both tests, 31 (83%) were 39 years old or younger and six (17%) were 40 years of age or older. Since there was not a sufficient number of individuals 40 years of age and older, these six individuals were not included in the last portion of the research that tested the new coefficients.

Gender: Of the first set of valid data for 74 individuals who completed both tests, 47 (64%) were male and 27 (36%) were female. Of the second set of valid data for 31 individuals who were 39 years of age and younger, 21 (68%) were male and 10 (32%) were female.

Motivation: Of the first set of valid data for 74 individuals who completed both tests, 32 (43%) were coerced and 42 (57%) were volunteers. Of the second set of valid data for 34 individuals who were 39 years of age or younger, 18 (58%) were coerced and 13 (42%) were volunteers.

#### Findings Related to Preliminary Research & Objectives 1 & 2

This section reports on the preliminary statistical testing with a paired t test that was utilized to determine if there were significant differences between actual MMPI scores and estimated

MMPI scores of 74 alcoholic men and women.

This section also reports on the statistical testing of hypotheses related to Objectives 1 and 2. The first objective seeks to establish if there is a significant difference between the actual MMPI profiles and MMPI profiles estimated through the use of Rodgers' 1966 regression formula. The first objective required statistical analyses using the paired t test. The .05 level of probability was selected as the level of significance for the statistical analyses.

The second objective of this study also required analyses and developed new regression coefficients for three categories or groups differentiated by age, gender and motivation.

Objective I: To determine if there are differences between actual MMPI profiles of alcoholic individuals in the first sample of 74 and profiles estimated using Rodgers' regression coefficients.

Hypothesis 1.1: There is no significant difference between actual MMPI profiles and MMPI profiles estimated through the use of Rodgers' regression formula.

Finding 1.1: For the first paired t test, using 74 valid sets of data, on five of the 13 MMPI scales, the computed P is smaller than the tabular P tested at the .05 level of significance, and the null hypothesis was not retained for those scales. The data are presented in Table 3.

Table 3  
Summary of Data from Statistical Analysis for the First Sample

Scale	Number	df	2-Tail Probability
L	74	73	.000
F	74	73	.059
K	74	73	.000
Hs	74	73	.064
D	74	73	.264
Hy	74	73	.056
Pd	74	73	.637
MF	74	73	.000
Pa	74	73	.125
Pt	74	73	.885
Sc	74	73	.449
Ma	74	73	.000
Si	74	73	.000

Conclusion 1.1: On the first paired t test, there was a significant difference on five of the 13 MMPI scales. These five scales are L, K, MF, Ma and Si. Since there was a significant difference on these five scales, the diagnoses would have been different than the diagnoses based on the actual profiles. L and K are validity scales and K is also used as a correction for five clinical scales, so it is especially significant that there were statistical differences on these scales.

Objective II: To estimate new regression coefficients for estimating MMPI scores from CPI data for four categories or groups differentiated by age, gender and motivation.

Hypothesis 2.1: There is no relationship between the CPI and the MMPI.

Finding 2.1: Regression analysis was used to estimate or predict MMPI scores from CPI data of 74 alcoholic men and women. The variables of gender, age and motivation were used to divide scores into eight groups. There were not sufficient numbers of male and female alcoholics 40 and over to compute accurate coefficients so these groups were discarded. The following new coefficients were established for estimating MMPI scale raw scores (y) from corresponding CPI scores (x):

Table 4

New Coefficients for Estimating MMPI Scores from CPI Data

Male Coerced, 39 and Under		Male Volunteers, 39 and Under	
L	$y = 3.98 + .74X$	L	$y = 3.94 + 1.00X$
F	$y = 9.19 + .56X$	F	$y = 8.15 + 1.03X$
K	$y = 3.56 + 1.49X$	K	$y = 5.14 + 1.65X$
Hs	$y = 5.86 + 1.45X$	Hs	$y = 5.33 + 1.74X$
D	$y = 11.07 + 1.37X$	D	$y = 8.88 + 1.51X$
Hy	$y = 8.25 + 1.50X$	Hy	$y = 16.91 + .78X$
Pd	$y = 4.66 + 1.25X$	Pd	$y = 21.76 + .27X$
MF	$y = 12.53 + 1.20X$	MF	$y = 21.36 + .69X$
Pa	$y = 9.44 + .59X$	Pa	$y = 3.52 + 1.21X$
Pt	$y = 6.0 + 1.55X$	Pt	$y = 4.83 + 1.72X$
Sc	$y = 8.57 + 1.56X$	Sc	$y = 4.18 + 1.86X$
Ma	$y = 11.22 + 1.13X$	Ma	$y = 13.36 + .90X$
Si	$y = 14.84 + 1.50X$	Si	$y = 14.82 + 1.37X$

Table 5  
New Coefficients for Estimating MMPI Scores from CPI Data

Female Coerced, 39 and Under		Female Volunteers, 39 and Under	
L	$y = 5.77 + .01X$	L	$y = 5.37 + .78X$
F	$y = 11.75 + .25X$	F	$y = 5.90 + 1.24X$
K	$y = 5.41 + .61X$	K	$y = 6.13 + .86X$
Hs	$y = 13.89 + .50X$	Hs	$y = 7.05 + 1.77X$
D	$y = 28.83 + .28X$	D	$y = 9.63 + 1.57X$
Hy	$y = 25.77 + .27X$	Hy	$y = 19.53 + .80X$
Pd	$y = 61.7 - 1.75X$	Pd	$y = 26.21 + .10X$
MF	$y = 30.85 + .31X$	MF	$y = 33.41 + .29X$
Pa	$y = 24.53 - .74X$	Pa	$y = 7.58 + .84X$
Pt	$y = 71.06 - 2.59X$	Pt	$y = .77 + 2.00X$
Sc	$y = 8.08 + 1.94X$	Sc	$y = 8.56 + 1.51X$
Ma	$y = 22.82 - .12X$	Ma	$y = 13.90 + .91X$
Si	$y = 38.74 - .19X$	Si	$y = 7.92 + 1.79X$

Conclusion 2.1: There are statistically significant relationships between the MMPI and CPI on all scales. These relationships vary for different groups categorized by age, gender and motivation.

### Findings Related to Objective 3

Objective III: To determine if the actual MMPI profiles of the second sample were significantly different than the estimated MMPI profiles that were calculated with the original Rodgers' coefficients and the new coefficients.

Hypothesis 3.1: There is no significant difference between actual MMPI profiles and Rodgers' original estimated profiles.

Finding 3.1: For this paired t test comparing actual MMPI raw scores to estimated raw scores obtained with Rodgers' 1966 formulae, using 31 sets of data from the second sample, on eight of the 13 MMPI scales, computed P is smaller than tabular P at the .05 level of significance, so the null hypothesis was not retained for those scales.

---

Table 6  
Summary of Data from Statistical Analysis of Actual MMPI Scores and Rodgers' Original Estimated Scores

Scale	Number	df	2-Tail Probability
L	31	30	.000
F	31	30	.255
K	31	30	.000
Hs	31	30	.582
D	31	30	.057
Hy	31	30	.323
Pd	31	30	.206
MF	31	30	.000
Pa	31	30	.004
Pt	31	30	.000
Sc	31	30	.035
Ma	31	30	.000
Si	31	30	.000

---

Conclusion 3.1: There were statistically significant differences on eight scales, L, K, MF, Pa, Pt, Sc, Ma and Si. When the same procedure was used with the first sample of 74, there were only five scales with significant differences, L, K, MF, Ma & Si. Therefore, there are increased differences between the two samples.



Hypothesis 3.2: There is no significant difference between actual MMPI profiles and new estimated profiles.

Finding 3.2: For this paired t test, using 31 sets of data from the second sample, on none of the 13 MMPI scales, is computed P smaller than tabular P at the .05 level of significance, and the null hypothesis was retained for all scales.

---

Table 7  
Summary of Data from Statistical Analysis of Actual MMPI Scores and Newly Estimated Scores

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Scale	Number	df	2-Tail Probability
L	31	30	.690
F	31	30	.881
K	31	30	.619
Hs	31	30	.431
D	31	30	.721
Hy	31	30	.903
Pd	31	30	.541
MF	31	30	.588
Pa	31	30	.381
Pt	31	30	.962
Sc	31	30	.074
Ma	31	30	.357
Si	31	30	.653

---

Conclusion 3.2: On this paired t test, there was not a significant difference on any of the 13 MMPI scales. Therefore, the new regression coefficients accurately estimated or predicted actual MMPI scores for the 31 individuals in the second sample. However, the newly computed scores are not exactly the same as the actual scores and could not be used for individual diagnoses.

Actual triatic codes, newly estimated triatic codes and Goldberg Indexes are summarized below:

Table 8  
Summary of Actual Triatic Codes, Newly Estimated Codes and Goldberg Indexes  
N = 17

Actual	Newly Estimated	Goldberg Index
8/4/2	8/7/2	86
6/8/0	8/4/9	141
9/8/7	6/4/2	70
9/4/3	7/4/9	61
8/9/7	8/3/7	85
8/2/4	8/2/1	74
8/4/3	9/4/6	76
4/8/2	2/4/5	96
9/8/6	9/8/7	87
8/7/6	7/6/4	98
6/4/7	8/2/6	89
8/7/1	4/2/8	77
8/9/7	8/7/4	104
8/4/3	4/7/6	77
6/5/9	7/8/4	105
8/6/7	4/2/8	85
8/7/2	4/7/8	81

#### Findings Related to Objectives 4 & 5

Objective IV: To determine if a general lowering of the overall CPI profile was found for neurotic, psychopathic and psychotic groups.

Hypothesis: 4.1: There is no relationship between a low CPI profile with t-scores below 25 and psychotic and psychopathic groups.

Finding 4.1: When the 31 sets of tests of the second sample had been sorted according to t-scores of  $< 25$  on each of the 18 CPI scales, there were 25 predictable MMPI's out of 31 (81% correctly identified). Also, a new group emerged, psychopathic patients.

---

Table 9  
Summary of Low CPI Profiles and Corresponding MMPI Profiles  
N = 31

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CPI  $> 25$  T-Scores / MMPI  $< 80$  T-Scores /  $< 70$  Goldberg Index

Normal Profiles - 8 out of 8

---

CPI  $< 25$  T-Scores / MMPI  $> 80$  T-Scores

Neurotic Profiles - 3 out of 4

---

CPI  $< 25$  T-Scores / MMPI  $>$  T-Scores /  $> 70$  Goldberg Index

Psychotic Profiles - 14 out of 17\*

---

CPI  $> 25$  T-Scores / MMPI  $> 80$  T-Scores /  $< 70$  Goldberg Index

Psychopathic Profiles - 2 out of 2

---

\* All but one profile had  $> 70$  Goldberg Index

Conclusion 4.1: A CPI t-score of less than 25 has a successful prediction rate of 81% in identifying neurotic, psychotic and psychopathic individuals who should then complete an MMPI.

Of the normal CPI profiles (t-scores above 25) there were no elevated MMPI profiles, except that two psychopathic MMPI profiles had normal CPI's (t-scores above 25) but MMPI Psychopathic Deviate (Pd) scores

of > 80.

OBJECTIVE V: To determine if the estimated MMPI scores of the second sample closely duplicated the actual means in the neurotic groups, slightly overestimated the pathology in the normal sample, slightly underestimated the pathology in the predominantly psychotic sample and psychopathic sample.

Hypothesis 5.1: The estimated scores of the neurotic group will not be greater than the actual profiles as measured by the standard deviation for each scale.

Findings 5.1: By subtracting the actual score of each scale from the estimated score of each scale and then subtracting this score from the standard deviation for each scale, a determination was made as to whether the score was within the standard deviation. The individual estimated scores for the neurotic group were not more than one standard deviation different from the actual profiles on all but three of the scales, Pd, MF and Pa. On any one neurotic profile, there were differences on only two scales. Please see the Appendices for a Neurotic Mean Profile Comparison.

Conclusion 5.1: The relationships of the estimated and actual profiles were close to duplicates for the neurotic groups. This result is supportive of Rodgers' original research finding that the profiles for neurotics are closely duplicated when estimated from CPI data.

Hypothesis 5.2: The estimated scores of the normal group will not be greater than the actual scores as measured by the standard deviation for each scale.

Finding 5.2: The individual estimated scores for 75 per cent of the normal group were more than one standard deviation different from the actual scores on three or more of the scales. The estimated scores were not consistently higher. Please see the Appendices for a Normal Mean Profile Comparison.

Conclusion 5.2: The relationships of the estimated and actual profiles were not predictable as in Rodgers' original research. Thus, they were not consistently overestimations of psychopathology.

Hypothesis 5.3: The estimated scores of the psychotic group will not be less than the actual scores as measured by the standard deviation for each scale.

Finding 5.3: The individual estimated scores for the psychotic group were more than one standard deviation different from the actual scores on some of the scales, but were not consistently lower. In the psychotic group of 17, ten profiles had overestimations on some scales. Please see the Appendices for a Psychotic Mean Profile Comparison.

Conclusion 5.3: The relationships of the estimated and actual profiles were not predictable as in Rodgers' original research. Thus, they were not consistently underestimations of psychopathology.

Hypothesis 5.4: The estimated profiles of the psychopathic group will not be different from the actual scores as measured by the standard deviation for each scale.

Finding 5.4: The individual estimated profiles for the psychopathic group were more than one standard deviation different from the actual profiles on some of the scales. Please see the Appendices for a Psychopathic Mean Profile Comparison.

Conclusion 5.4: There were only two psychopathic profiles and the estimations were not consistent. One profile was closely duplicated while the other was an underestimation.

#### Summary

This chapter reported on the data analyses for this study. Nine null hypotheses were tested using two samples for statistical analyses. Three of the hypotheses were supported and provided significant findings. The hypothesis regarding relationships between the CPI scales and the MMPI scales resulted in new regression coefficients. The hypothesis that there were no significant differences between actual MMPI scores and newly estimated scores was retained since there were no significant differences on any of the scales. It was concluded that the newly estimated regression coefficients could estimate actual MMPI profiles for alcoholic men and women 39 and under who were either volunteers or coerced patients.

Finally, the hypothesis that CPI profiles with t-scores below 25 would be found for the neurotic, psychotic and psychopathic patients was supported. It was concluded that 81% of the CPI profiles with t-scores below 25 predicted those individuals who would have elevated MMPI profiles.

There was no overall consistency in the relationships between the newly estimated and actual MMPI profiles. This finding is different than that of Rodgers in the original research when he found that neurotic profiles closely duplicated the actual means in the neurotic groups, slightly overestimated the pathology in the normal sample and slightly underestimated the pathology in the predominantly psychotic sample. Only the profiles from the neurotic group were closely duplicated and even then there was a significant difference on some of the scales.

## Chapter V

## DISCUSSION

Although, it has been part of the clinical lore that a depressed CPI profile reflects the presence of clinical psychopathology, a careful review of the literature did not provide any empirical evidence to support that assumption. This study found that a generally low CPI profile with t-scores of 25 or less correlated with the presence of major psychopathology. This is considered the main value of the study.

The primary problem of this study was to determine if CPI data can be used to estimate accurately MMPI raw scores for alcoholics. Rodgers (1966), Megargee (1972) and Shusman and Inwald (1987) have conducted research to determine if this approach can be successfully used with a variety of populations that did not include alcoholics. All these studies concluded that the estimated profiles were not exact enough to be used for anything but research. Earlier research on estimating MMPI profiles from CPI data did not include the variables of gender, age and motivation. Therefore, these variables were added to this study. However, the conclusion is similar to earlier research. Even though there were not significant statistical differences between actual and estimated MMPI profiles, the scores were not exact enough for use in diagnosis of individual personalities.

The problem was expanded to encompass whether generally



low CPI scores were predictors of elevated actual MMPI scores. Megargee (1972) concluded that the mean profiles of the samples of alcoholic patients are quite similar and patterns resemble those of other socially deviant groups, with a general lowering of the overall CPI profile. Forgac and Michaels (1982) used the Goldberg Indexes for differentiating normal from deviant and psychiatric from sociopathic MMPI group profiles. They found that the criminal group had greater elevations on MMPI psychopathic deviate and schizophrenia scales than the non-criminal group. Their conclusion was that the criminal group had lower elevations on the CPI's responsibility and socialization scales. Gregory and Morris (1978) also concluded that "low scores on CPI scales appear to reflect general maladjustment rather than indicating the polar opposite of high scores" (p. 264).

This study found that generally low scores (t-scores < 25) on CPI scales reflect a general maladjustment and that when those individuals complete MMPI's there is an 81% chance of a correct prediction of elevated MMPI scores.

### The Samples

The subjects of this study were the patients who completed both the CPI and MMPI after admission to White Oaks Residential Alcohol Treatment Program in Salem from June 1986 to the end of March 1987. The original design of this study required pre and post-testing with the CPI and MMPI for program evaluation to document effectiveness

of treatment. The CPI and MMPI were administered during the first two weeks of treatment and post testing was approximately ten weeks later. However, so few patients completed post-testing during the first eight months of the research that it was calculated that testing would take approximately three years to obtain enough data to complete the original study. There were also problems with the low number of coerced individuals who completed ten weeks of after care. The majority of completions were by volunteers. The original study also included the variables of gender, age and motivation. The limited data available from pre and post-testing usually had lower MMPI profiles from post testing. Therefore, it appears that when the MMPI is administered in residential alcohol treatment programs, it should be later in the program since these later profiles would more accurately report on the patients after detoxification.

#### Analysis of the Data

The data were prepared for and analyzed by the Cyber using Statistical Package for the Social Sciences (SPSS). Data analyses involved a number of steps that required statistical analyses with paired t tests to determine if there were significant differences between the two sets of formulas for estimating MMPI profiles. Regression analysis was utilized to calculate new regression equations that were used to estimate MMPI scores for the tests in the second sample. Data analysis also involved descriptive statistics in determining if estimated MMPI profiles were accurate

and if a generally low CPI profile with t-scores of 25 or less could be used to determine which individuals need to complete an MMPI. Finally, estimated and actual MMPI profiles were compared to determine if there were overestimations or underestimations of psychopathology.

This study revealed that there were statistically significant differences between estimated MMPI raw scores using the original Rodgers' formula and the actual MMPI scores of groups of alcoholics. However, the newly computed coefficients for estimating MMPI profiles from CPI data of alcoholics proved to be not significantly different from actual MMPI raw scores. Therefore, there is an indication that the variables of gender, age and motivation do need to be taken into consideration when computing estimations of MMPI profiles. The newly computed coefficients for estimating MMPI profiles from CPI data for alcoholic men and women can provide useful research measures of psychopathology from the CPI data alone. However, even though there were not significant differences between the new estimations and the actual MMPI profiles, the estimations were not exact enough for use in diagnosing individuals because the triatic codes for the estimated profiles were different from the actual profiles. However, an estimated profile that is elevated or a generally low CPI profile can be an indicator that psychopathology may be expected and an actual MMPI should be administered.

This study has concluded that estimated MMPI profiles closely duplicated the actual profiles in the neurotic groups except for three scales. However, there was little consistency between the estimated MMPI profiles and actual profiles for normal, psychotic or

psychopathic groups. This disagreed with early findings by Rodgers that there was slight overestimation of pathology in the normal samples and slightly underestimated pathology in the predominantly psychotic samples.

On the basis of this research, it is recommended that patients in residential alcohol treatment centers complete the CPI within the first week after admission. The CPI results could be used in treatment planning and to determine those individuals that should complete an MMPI later in the program for additional treatment planning and diagnostic interpretation. The MMPI may be necessary to identify individuals who have dual diagnoses of alcoholism and psychosis. If the institution has program evaluation in place, the CPI could be administered at the end of aftercare and compared to the first CPI to measure progress of each individual in the treatment program. The post testing should reveal individual CPI profiles that are higher than the pre-testing interpretations if the treatment has been successful.

There is a need for additional research to determine if a generally low CPI scale indicates psychopathology for groups other than alcoholic individuals. Since revised editions of both tests are available or will soon be available, additional research will be needed to determine if a low CPI profile indicates psychopathology for various populations.

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## APPENDICES



## APPENDIX A

## Questionnaire

Number \_\_\_\_\_

Date of Entry: \_\_\_\_\_

Did you voluntarily enter this program? \_\_\_\_\_

Did your attorney suggest you enter this program? \_\_\_\_\_

Did you enter the program after an arrest? \_\_\_\_\_

Did your employer require you to enter this program? \_\_\_\_\_

Did your family insist that you enter this program? \_\_\_\_\_

Date of Birth \_\_\_\_\_ Age \_\_\_\_\_ Sex \_\_\_\_\_

Employed? \_\_\_\_\_ Unemployed? \_\_\_\_\_

Occupation? \_\_\_\_\_ How long in your present job? \_\_\_\_\_

How many jobs have you had in the past five years? \_\_\_\_\_

Previous occupation (s) \_\_\_\_\_

Educational level \_\_\_\_\_

(Indicate Highest Grade or Level Attained)

Marital status \_\_\_\_\_

Times married previously? \_\_\_\_\_

Is your mother alive? \_\_\_\_\_ Father? \_\_\_\_\_

Have you ever been arrested for an alcohol related offense? \_\_\_\_\_

Indicate number of arrests \_\_\_\_\_

Date of most recent arrest \_\_\_\_\_

Have you ever been arrested for a drug related offense? \_\_\_\_\_

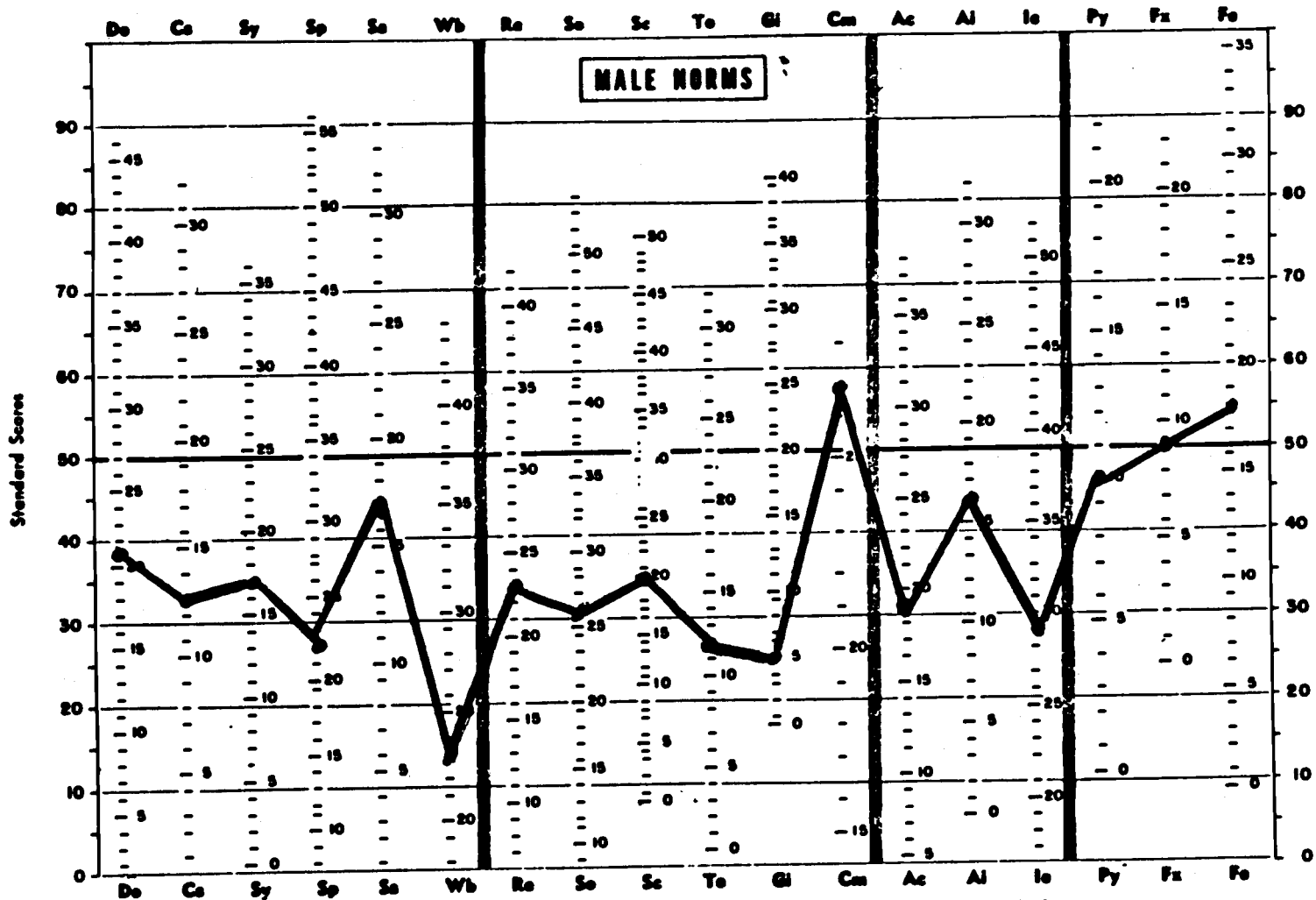
Date of most recent arrest \_\_\_\_\_

Do you have a day scheduled for court? \_\_\_\_\_

Have you attended an Alcoholics Anonymous meeting? \_\_\_\_\_

Have you participated in an alcohol treatment program before ? \_\_\_\_\_

# California Psychological Inventory

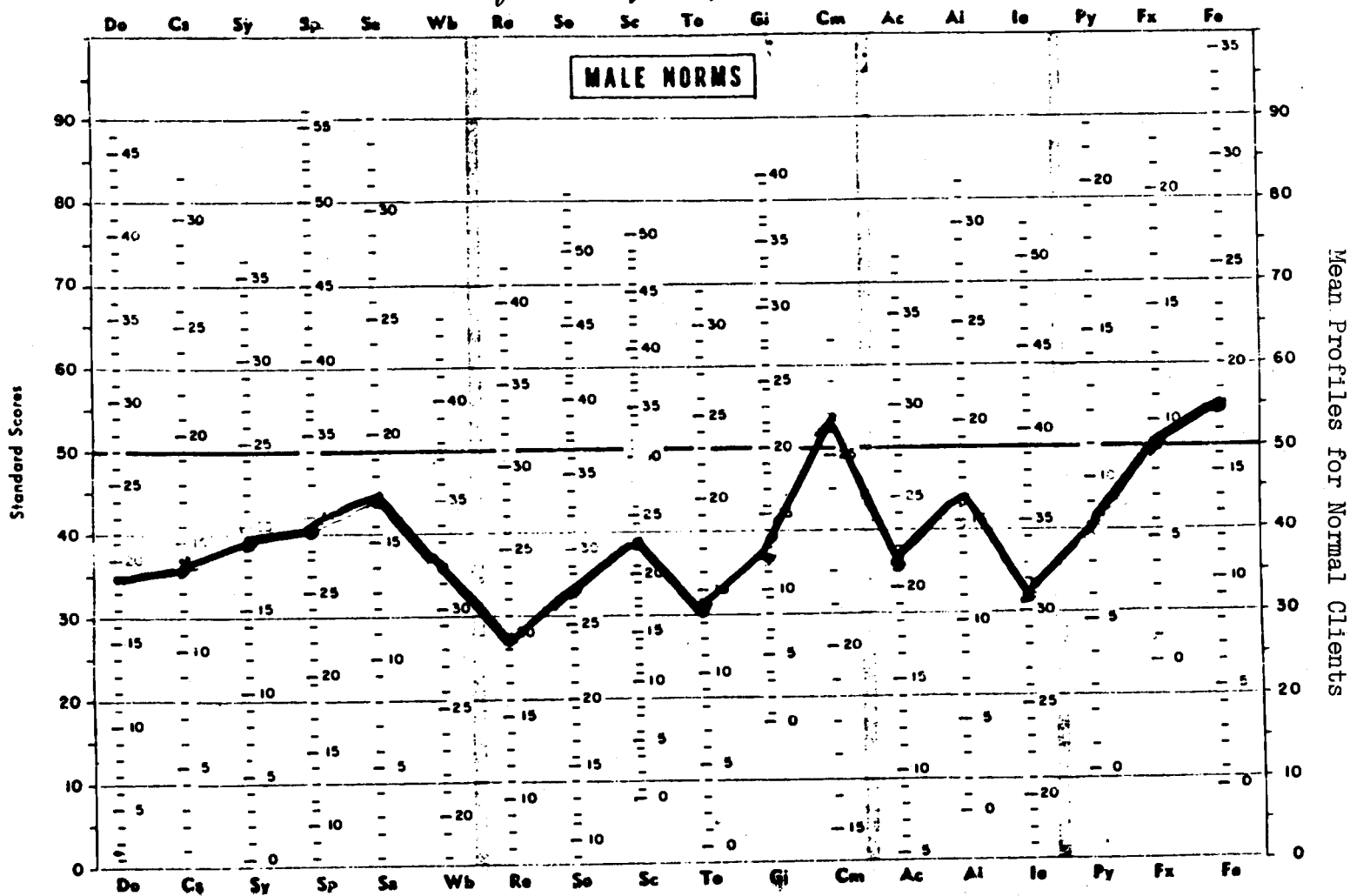


Mean profiles for two alcoholic patients with neurotic MMPI profiles.

Mean Profiles for Neurotics

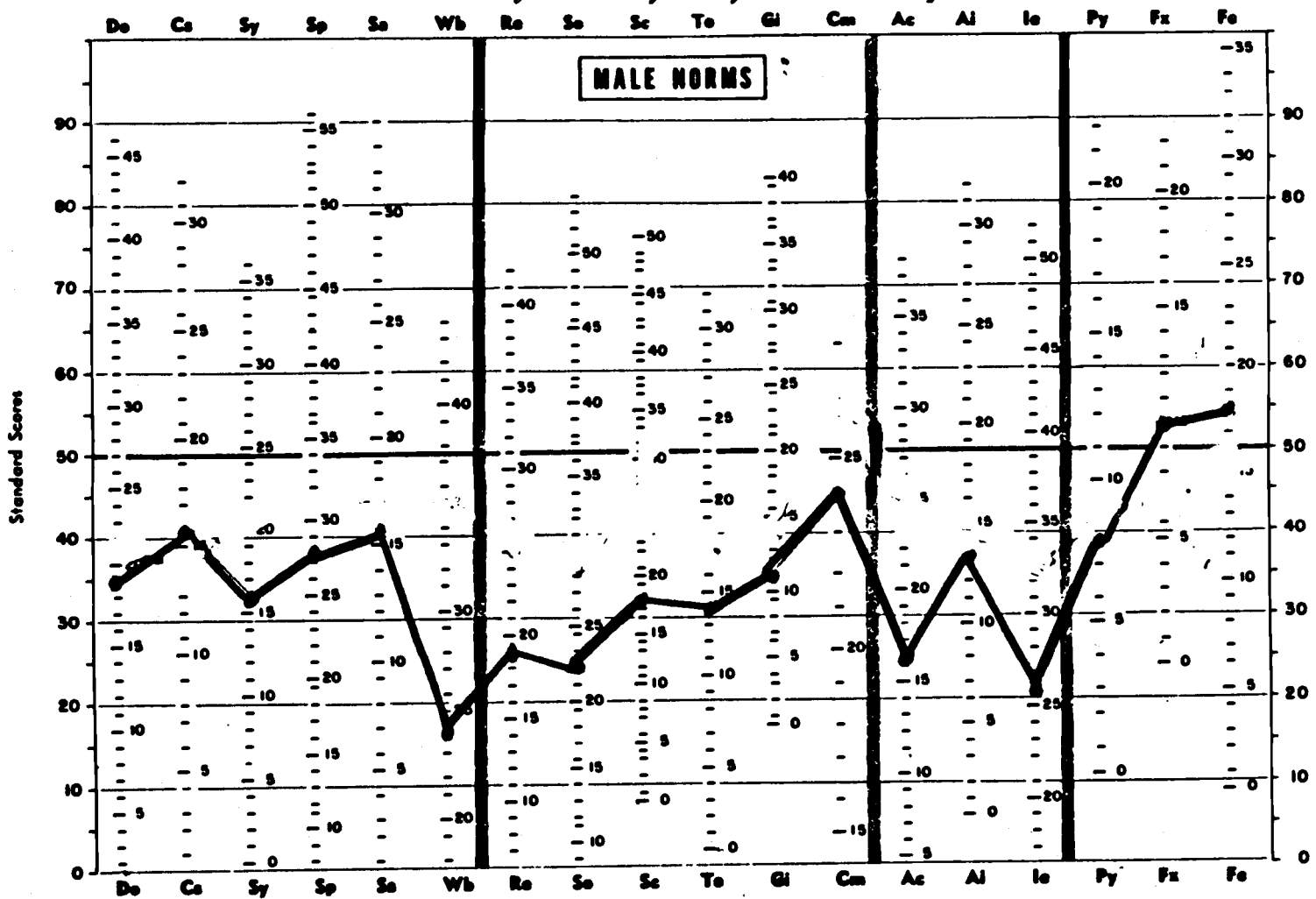
APPENDIX B

# California Psychological Inventory



Mean profiles for seven alcoholic patients with normal MMPI profiles.

# California Psychological Inventory

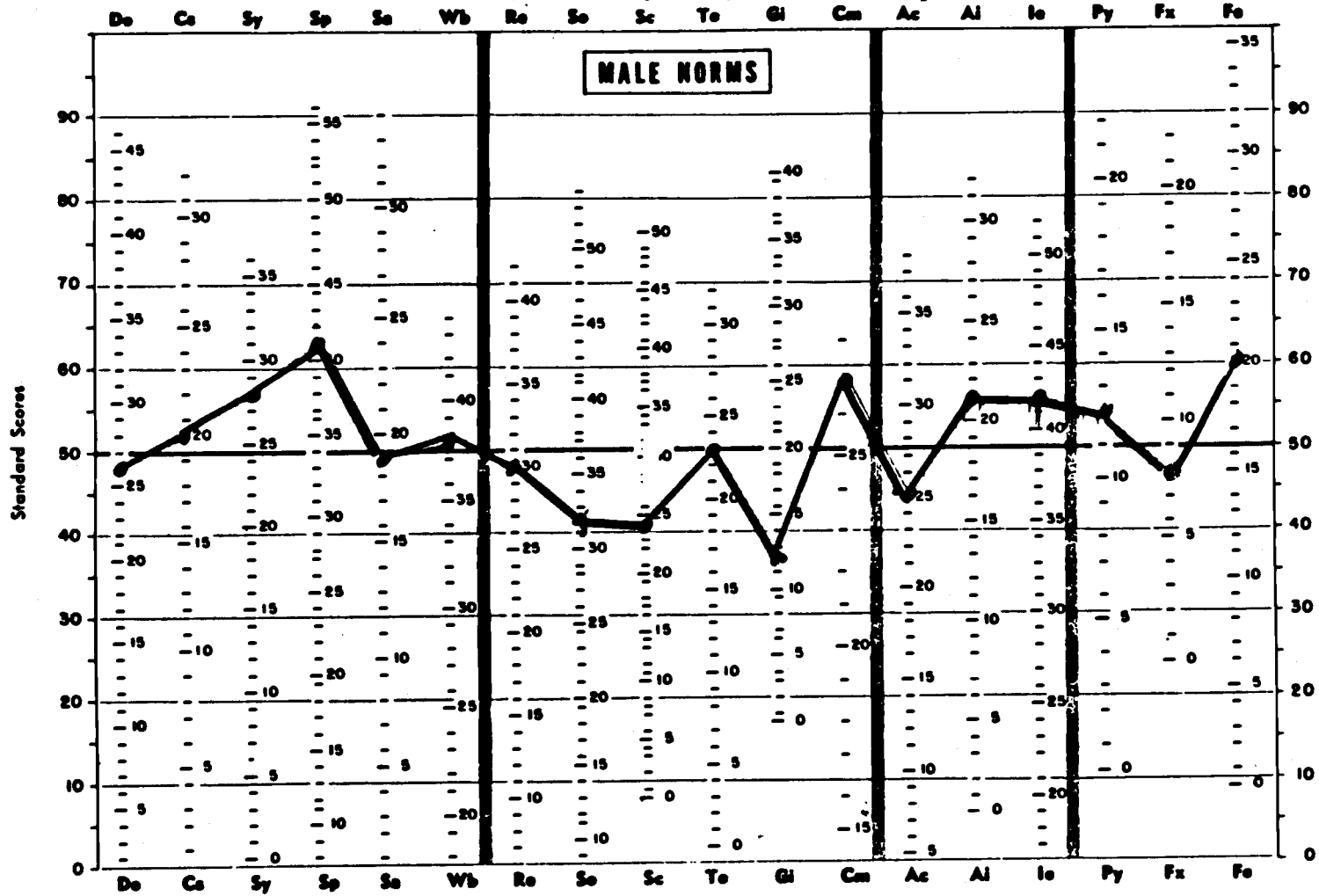


Mean profiles for ten alcoholic patients with psychotic MMPI profiles.

Mean Profiles for Psychotic Clients

APPENDIX D

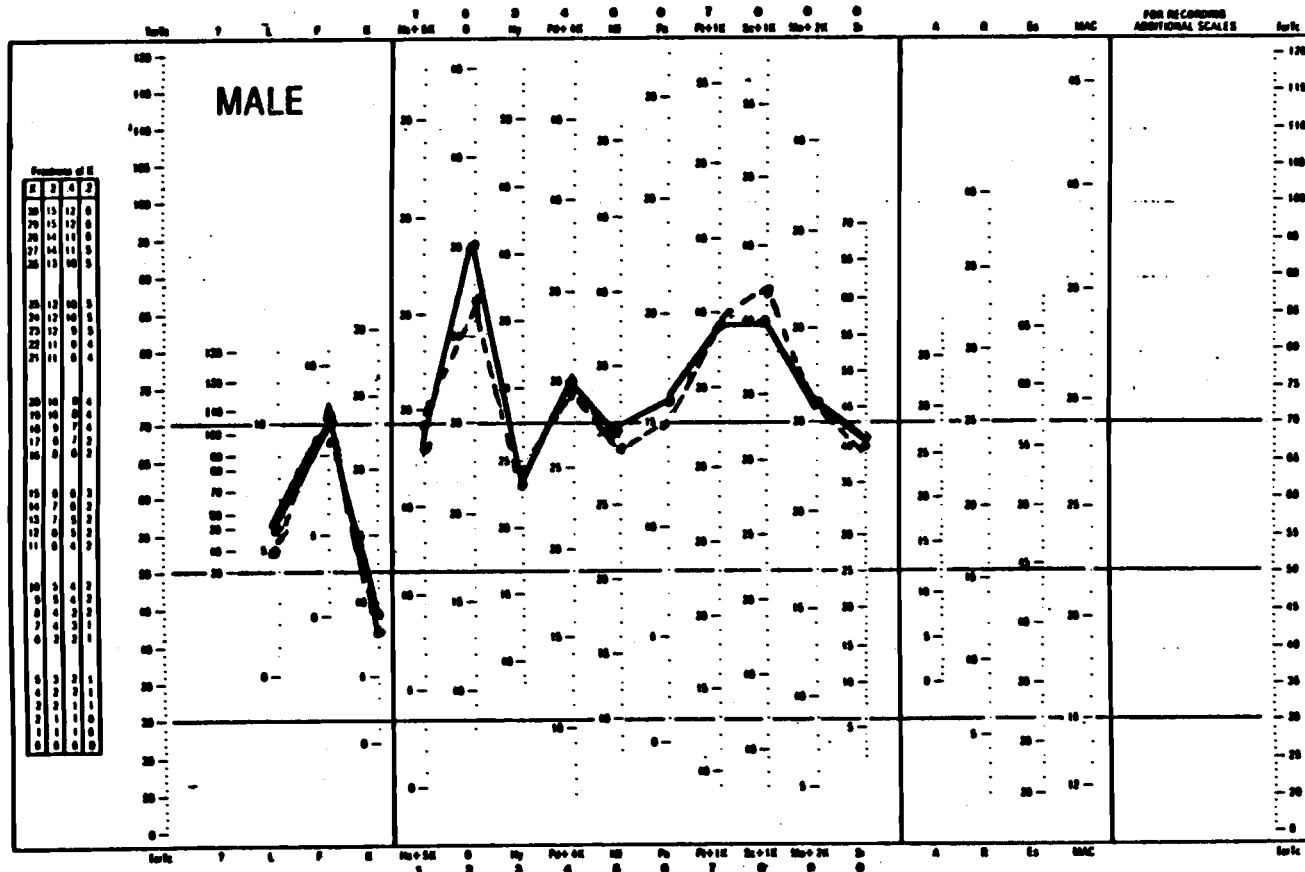
# California Psychological Inventory



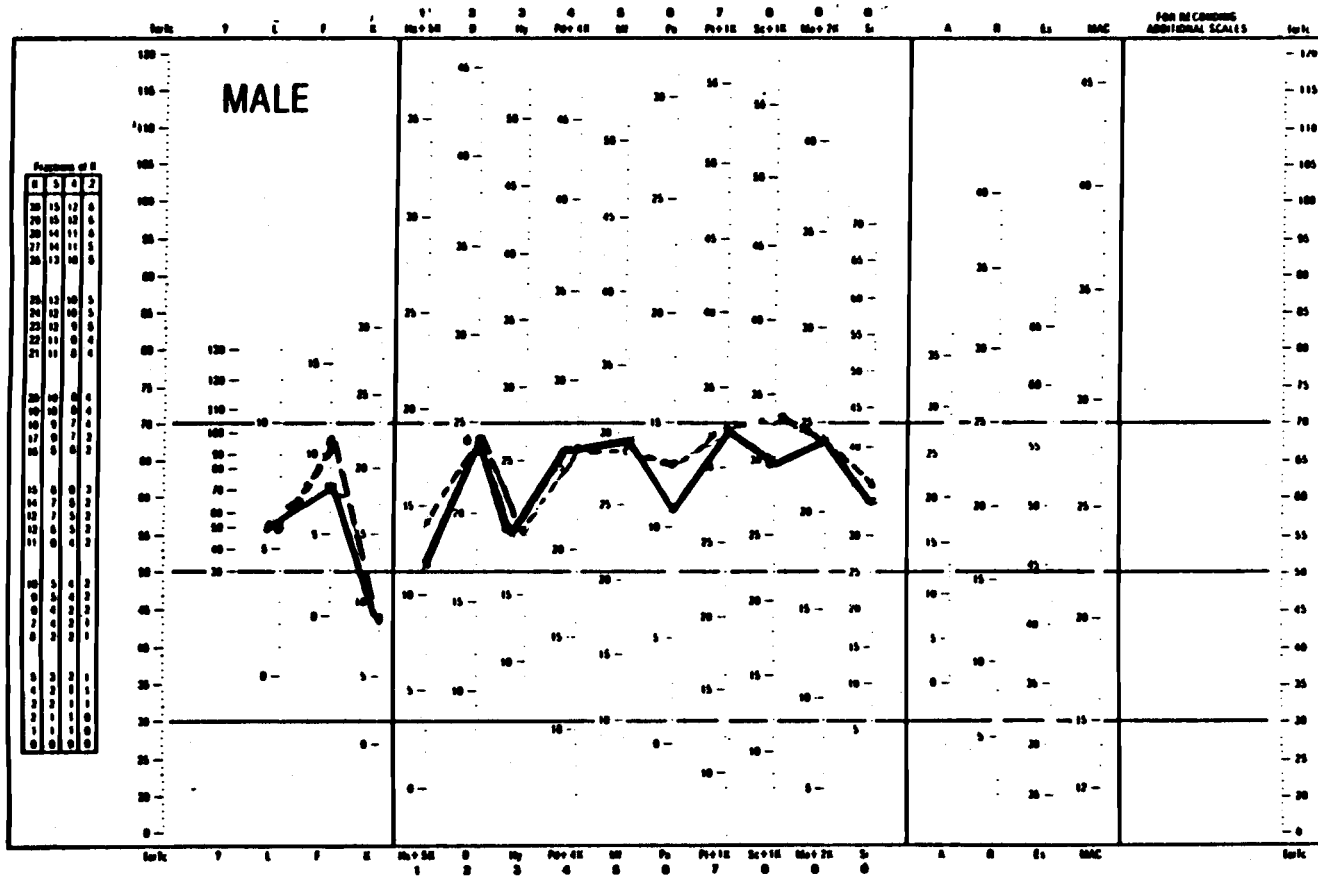
Mean Profiles for Psychopathic Clients

APPENDIX E

Mean profiles for two alcoholic patients with psychopathic MMPI profiles.



MMPI neurotic mean profile comparison. Broken line: estimated scores.  
Solid line: actual scores.



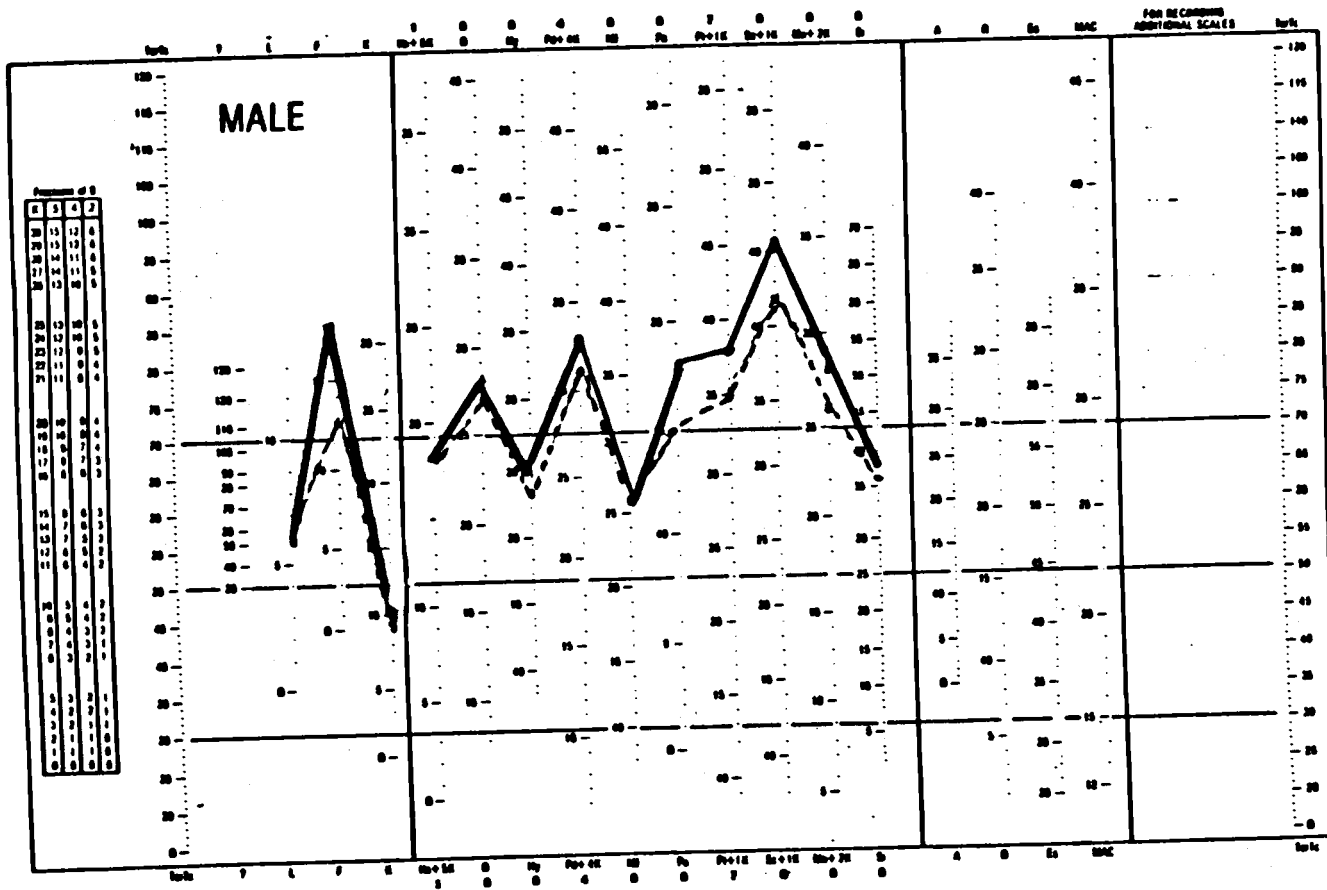
MMPI normal mean profile comparison. Broken line: estimated scores. Solid line: actual scores.

Normal Mean Profile Comparison

APPENDIX G

Psychotic Mean Profile Comparison

APPENDIX H



MMPI psychotic mean profile comparison. Broken line: estimated scores. Solid line: actual scores.