THE UNIVERSITY OF MICHIGAN

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Final Report

A PREDICTIVE STUDY OF EMPLOYABILITY AMONG THE VISUALLY IMPAIRED
WITH THE CALIFORNIA PSYCHOLOGICAL INVENTORY

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ABSTRACT

The purpose of the study was to determine the extent to which the

California Psychological Inventory (CPI) is an effective instrument for

identifying personality trait differences between groups of employed

and unemployed blind, and whether such differences could be used to

predict employability among the blind.

This study consisted of Standardization and Cross-Validation

phases. The Standardization sample included 51 visually impaired males

who were employed full time for at least 2.8 years in occupations not

requiring a college degree and 50 visually impaired males who were un-

employed for at least 2.7 years. The CPI was administered by means of

a tape recorded presentation of the items for card sort according to

their agreement or nonagreement with each item. An Interview instru-

ment was developed and administered to each subject for the purpose of

comparing the employed and unemployed on selected demographic charac-

teristics.

Initial analysis of CPI data indicated that the unemployed scored

significantly lower than the employed on nine scales. When the scale

score differences were analyzed by a Discriminant Analysis for two

groups, a Mahalanobis D^2 or generalized difference between the groups

was significant at the .001 level of confidence suggesting the dissim-

ilarity of personality traits between the employed and unemployed.

An Employment Key scale was developed with 21 CPI items which best

discriminated between the employed and unemployed. With a suggested

cutting score at 12, 90% of the employed and 72% of the unemployed

Standardization subjects were identified.

Stepwise Discriminant Analysis identified the most efficient com-

bination of CPI scales for predictive classification of subjects. Two

and five variable equations were developed. The most efficient used

the Employment Key and Tolerance scales with the following coeffi-

cients: Employed = -11.459 + 1.698Ek - .116To; Unemployed = -4.734

+ .596Ek + .243To. These discriminant functions are for use with raw

scores; whichever equation produces the larger value determines the

subject's predicted classification, employed or unemployed. These

equations classified correctly 94% of the employed and 82% of the un-

employed in the Standardization sample.

These findings were applied to 15 unemployed and 11 employed

Cross-Validation subjects with the following results. The Employment

Key identified 82% of the working and 73% of the nonworking subjects. ⁸

The discriminant functions established on the Employment Key and Toler-

ance scales classified 82% of the working and 80% of those not working.

These findings provisionally suggest personality traits which may

differentiate the employed from the unemployed. The employed seem to

have stronger feelings of self-worth, to be less inhibited by excessive

fear, and to have a greater capacity for both adaptive behavior and

commitment to goal directed activities. The employed may be more per-

missive and accepting of the personal beliefs of others as well as less

authoritarian and self-centered than their unemployed counterparts.

In general, the results are promising and may provide a useful approach to employment prediction as well as identify certain relationships between personality traits and employability. The CPI would appear to be a useful instrument with the visually impaired. For those concerned with developing the manpower of the visually impaired it should be emphasized that the Employment Key scale items and the discriminant functions presented can be conveniently used on an individual basis. Two important considerations pertain to the application of these findings. The limitations of the relatively small samples and the unanticipated difficulties encountered in obtaining unemployed subjects should be recognized.

Additional analyses for data collected in this study were suggested and implications for further research were discussed.

CHAPTER I

INTRODUCTION

Barriers to employment commensurate with an individual's potential
may arise from long term unemployment, social disadvantage, minority
group membership, displacement by automation, or various physical and
emotional impairments. The ranks of both the unemployed and under-
employed waste manpower and decrease the Nation's productivity. Per-
sonal hardship and the economic drain of public assistance are addi-
tional by-products.

It is well known that body disablement creates for the individual
a special set of problems. These problems are unique for each individ-
ual in that their existence depends upon the degree of body dysfunc-
tion, its limitation on normal functioning, and individual's perception
of his impairment, and how he adapts to it. While body impairment
itself may be vocationally handicapping for certain jobs, difficult
questions arise as to which other factors, or combinations thereof,
contribute to successful employment for some persons while not for
others who have comparable physical limitations.

Economic deprivation from either under-employment or unemployment
is a chronic problem among the visually impaired. Scholl (1969),
studying a group of 126 visually impaired with a mean IQ of 106.7,
found the mean annual income for 1967 to be $5,500, with 12 subjects
receiving $500 to $1,000, and three receiving $20,000 or more. A

total of 34 subjects was receiving some kind of public assistance.

Workers with the blind attribute the high rate of under-employment and unemployment to a variety of factors, in addition to visual impairment, which in and of itself may limit employment opportunities for the blind. These include: low intelligence, poor adjustment to visual handicap, poor travel ability, over-protective home situations, inadequate job training facilities for the visually impaired, an insufficient number of job opportunities, discrimination by employers, and a system of Social Security Disability benefits and Public Assistance which tend to increase dependency by jeopardizing payments when efforts to work are made.

Many of these factors represent influences that are beyond the control of the individual; some, however, are directly related to personality. A knowledge of personality characteristics which are more directly related to successful employment may alert rehabilitation agency personnel to those potential personality problems which may present barriers to full employment. Most rehabilitation workers include in the psychological evaluation of the client a systematic assessment of personality functioning as well as intellectual ability, aptitude and interest patterns.

It is possible that systematic personality measurement can contribute to client understanding relative to such factors as readiness for vocational training, personal adjustment training, and the capacity for work responsibilities. Such information may be particularly

helpful in interdisciplinary settings which focus on the preparation of blind persons for employment.

The purpose of this study was to explore whether a systematic assessment of personality functioning of the visually impaired could identify relationships between certain personality traits and potential for employment.

CHAPTER II

RELATED LITERATURE

Research related to personality and personality assessment of the

visually impaired in presented in the following sections: psychologi-

cal implications, psychoanalytic viewpoints, and personality testing.

The final section reviews research on the California Psychological

Inventory.

Psychological Implications of Blindness

The psychological implications of blindness are in general derived

from studies of impairment itself. Raskin (1962) takes the position

that blindness in and of itself does not produce maladjustment but that

it does present problems in practical living. The correlates of mal-

adjustment are derived from the attitudes of others, particularly

parents and society. This view is consistent with that of Cowen,

Underberg, Verillo, and Benham (1961). Lowenfeld (1955) maintains that

blindness creates problems sui generis only in certain areas of cogni-

tive functioning and in mobility. Underberg, Verillo, Benham, and

Cowen (1961) found no systematic differences in personality attributes

on seven global measures of adjustment for blind and nonblind.

Scott (1969), Cutsforth (1962), and Freedman (1965) discuss the

effects of the interpersonal attitudes of the family upon the personal-

ity development when a blind individual lives in a social world which

is unaccustomed to the condition of blindness. MacFarland (1966)

suggests that the intensely visual orientation of our society leaves

the blind decisively isolated from easy social interaction and practi-

cal convenience.

Rusalem (1950) and Cowen, Underberg, and Verillo (1958) studied

social attitudes toward the blind. Significant correlations were found

between negative attitudes to blindness and various antiminority, and

proauthoritarian attitudes.

Krause (1962) and Carroll (1961) postulate a relationship between

the psycho-social dependency needs of the blind as acquired from the

family setting and future rehabilitation progress. Bauman (1954; 1963)

takes the position that the difference between being self-supporting

and being dependent is related to the attitudes of the blind toward

themselves, others, and toward blindness itself rather than to such

physical facts as the amount of vision, health, or education. Cole and

Taboroff (1955) and Freedman (1966) discuss social and environmental

aspects which they feel bear upon the personality growth and develop-

ment of the blind individual. The personal response to physical loss,

including visual impairment, and the adjustive efforts to permanent

disablement are discussed by Dembo, Leviton, and Wright (1969) and

Wright (1960).

In summary, it appears that personality adjustment among the blind

is more related to such factors as home background, parental and

community attitudes, and attitudes toward self than to the blindness itself. The reader is referred to Lowenfeld (1955; 1963) for an extensive review of the literature regarding the psychological problems of visually impaired children, and to Goldberg (1969) for a relatively current, comprehensive review of research on blindness.

Some Psychoanalytic Viewpoints on Blindness

There have been set forth some psychoanalytic views regarding blindness. Freud (1959) notes that the eye as the faculty of vision provides a link between the ego and consciousness and the external world. Blank (1957, 1958a, 1958c) discusses the symbolic significance of the eye and vision relative to unconscious conflicts in psychosexual and ego development in both the congenitally and the adventitiously blinded. He stresses the importance for workers to recognize the possibility of unconscious conflicts arising from their own relationships with blind clients (Blank, 1958b).

Cholden (1952; 1958), in discussing the adjustment process in adventitious blindness, stresses the need for personal internal reorganization before the person is able to awaken to the fact that he is, after blindness, a different person with a different body image. He stresses the role of the ego-recovery capacity to deal with the shock period, emotional withdrawal, and mourning.

Fries and Woolf (1953) stress the impact of environmental experi-

ence occurring before the differentiation of the ego and the id and

compare this influence with the importance of constitutional factors.

Fraiberg and Freedman (1964) studied arrested ego development of certain

deviant blind children whose personalities remained frozen on the level

of mouth-centeredness and nondifferentiation. Fraiberg, Siegel, and

Gibson (1966) suggest the importance of the role of vision in early

ego development and the function of vision in facilitating and insuring

the autonomous functions of the ego.

Nagera and Colonna (1965) discuss the differences and similarities

between blind and sighted children relative to ego and drive develop-

ment, regression and fixation points, tolerance of anxiety, reaction to

frustration, and potential for sublimation. Sandler (1963) suggests

there is an irreversible regressive pull toward self-centeredness with

a basic retardation in ego development in blind children. She suggests

the likelihood of a lesser drive for mastery and a retreat from the ex-

ternal world which may have a profound effect on later stages of devel-

opment.

Burlingham (1961) suggests that the blind child remains in a pro-

longed state of dependency upon objects which substitute for the func-

tion of the eyes. Burlingham (1965) notes that motor immobilization

is a mode of self-protection for young blind children and suggests that

this motor restraint is displaced to other ego functions thereby re-

sulting in blindisms and other repetitive behaviors. Further, the pro-

cess of verbalization is divided between certain meaningless words of

the sighted based on memorized definitions and word symbols developed

through their own personal experience.

In general, the psychoanalytic view stresses the important role of

vision in ego development and functioning.

Personality Testing of the Blind

Research in the area of personality testing with the blind is not

extensive. This section summarizes relevant studies on the use of pro-

jective and "objective" tests with the blind.

PROJECTIVE TECHNIQUES

Wachs (1966) evaluated the following projective techniques which

have been or could be used with the blind: the Auditory Apperception

Test (ATT), the Gramphomotor Projection Technique, the Insight Test (IT),

the Twitchell Allen Three Dimensional Personality Test, and the Rotter

Incomplete Sentences Blank (ISB). He suggests that better scoring

methods and normative data for the blind be developed for the instru-

ments. In addition, he proposes that a qualitative, thematic scoring

of the ISB would be more useful with the blind than the objective

scoring method. This position is supported by Dean (1957). Wright

and Trotter (1968) suggest a battery of tests that may be useful in

personnel selection. A Sentence Completion Test, developed for this project, correlated significantly with job hierarchy and salary. Lebo and Bruce (1960) and Raskin (1962) review the status of projective techniques for the blind and indicate that such measures have not "caught on" and the lack of normative data renders them of provisional value.

"OBJECTIVE" TESTS

Paper and pencil type personality inventories have been used with blind subjects. However, there are certain reservations expressed regarding the use of "sighted" norms, the significance of the adjustments necessary for test administration, and the meaning of certain items to persons blinded early in life.

Hayes (1949) pioneered the testing movement with the blind including the use of personality inventories. However, he is best known for his work in the measurement of intelligence.

The Minnesota Multiphasic Personality Inventory (MMPI), developed by Hathaway and McKinley (1943), has been used with the blind. Wachs (1966) reviews some modifications of administration to blind subjects. Cross (1947) used a braille version of the MMPI and found that the blind differed from sighted norms on only 20 items of the original 550. Dean (1957) likewise found "normal" MMPI profiles with his blind subjects. Bonk (1955) recorded the MMPI for card sort and identified MMPI profiles which differentiated between various occupational groups of the blind.

Bauman (1950; 1954) developed the Emotional Factors Inventory
(EFI), an eight scale, true-false inventory of 170 items which purports
to measure adjustment to blindness and excludes items which may have
different implications for a blind person. Items are reportedly de-
rived from an analysis of statements of rehabilitation workers about
the personality qualities and difficulties of their clients. An Ado-
lescents Emotional Factors Inventory is also available (Bauman, Platt,
and Strauss, 1963; Bauman, 1964).

Dean (1957) compared judges' ratings of subjects' adjustment to
blindness with scores obtained from the MMPI, EFI, Rotter Incomplete
Sentences Blank, and the Sargent Insight Test. None of these measures
agreed with adjustment as determined by judges' ratings in his group
of 53 rehabilitation candidates. However, he felt the MMPI is appli-
cable to the blind without modification and that the need for separate
norms was not indicated. His EFI and MMPI protocols suggest that the
blind are not paranoid or depressed as a group. He reported that the
EFI did not discriminate adjustment of the subjects in his design, and
that some items showed too much variability suggesting the need for
more refinement to be useful for individual prediction. Further, he
recommends the Sargent Insight Test for cautious use with the blind.

The use of the Bernreuter Personality Inventory and California F
Scale are not recommended by Wachs (1966) for use with the blind on the
basis of the deviant results reported by Greenberg and Jordan (1957).

Sources of information on tests and testing techniques for use

with blind adults and adolescents have been developed by Bauman and

Hayes (1951) and Dishart (1959; 1960).

Although there appears to be interest in the area of personality

testing of the blind, there is little systematic or definitive research

on the relationship of such tests to performance criteria. Studies

summarized in this section seem to be more concerned with factors such

as modifications necessary for administration to the blind and com-

parisons of the blind on "sighted" norms than with the application of

test results to predictive criteria. In addition, it appears that one

widely accepted personality measure, namely, the California Psycho-

logical Inventory, has not been systematically studied with blind sub-

jects. Prior experience with the CPI in a rehabilitation setting led

the investigator to consider this instrument to study the question of

whether a standardized "objective" personality test could discriminate

between employed and unemployed visually impaired subjects. An addi-

tional reason for utilizing the CPI was the extensive literature avail-

able concerning its application. The following section summarizes some

of the research related to the California Psychological Inventory.

The California Psychological Inventory

GENERAL DESCRIPTION

The California Psychological Inventory (CPI) is a paper-and-pencil

personality assessment device developed for the comprehensive, multi-
dimensional evaluation of "normal" persons (Kelly, 1965). The test

includes 480 items which yield 18 scale scores. Answer sheets are

available for hand or machine scoring. A special test profile sheet

has been published on which the 18 scale scores may be plotted. A copy

of this profile sheet and a listing of the standardized scales, scale

abbreviations, and classes of scales from the Manual may be found in

Appendix C (Gough, 1957).

The inventory can be administered either individually or in

groups.* The standardized instructions require the subject to read

each item, decide whether he agrees or disagrees with what is stated,

and then mark true or false on the answer sheet. The subject may omit

items if he prefers not to answer. Testing time is about 45 minutes.

Items may be read aloud for poor readers (Bennett and Rudoff, 1957),

explained if questions are asked, and the inventory may be completed

in different sessions, with or without supervision (Gough, 1968c). The

inventory has been used on a mail-out/mail-in basis (MacKinnon, 1962).

The inventory has been used from the junior high school level

(Keimowitz and Ausbacher, 1960; Pierce, 1961), through high school

(Gough, 1964a; Snider, 1966), at the college level (Aiken, 1963; Johnson

and Frandsen, 1962; Cersen and Parker, 1966), across educational levels

(Schendel, 1965), in adult life (Goodstein and Schrader, 1963; Gough,

1966a) and in old age (Schaie, 1959).

*Personal communication with Harrison G. Gough, April 30, 1970.

The CPI author does not imply that the 18 scaled dimensions of the CPI are independent but groups them into four categories (Kelly, 1965). The scales in Class I share a common emphasis on feelings of interpersonal and intrapersonal adequacy designeted as "Measures of Poise, Ascendency, and Self-assurance" (Scales Do, Cs, Sy, Sp, Sa, and Wb). The scales of Class II are concerned with social norms, values, and the disposition to observe or reject such values. They are described as "Measures of Socialization, Maturity, and Responsibility" (Scales Re, So, Sc, To, Gi, and Cm). The scales of Class III bear on academic and intellectual endeavors and are designated as "Measures of Achievement Potential and Intellectual Efficiency (Scales Ac, Ai, and Ie). Class IV scales (Py, Fx, and Fe) are described as "Measures of Intellectual and Interest Modes."

Approximately 200 of the CPI items appeared originally in the MMPI. Eleven of the 18 scales were empirically derived, i.e., developed with items which were found to differentiate defined criterion groups such as dominant versus nondominant individuals so defined by independent criteria. Four scales were constructed by gathering items bearing a theoretical relevance to a personality trait and refining them through internal consistency analysis. Three remaining scales were derived empirically to detect tendencies of subject to fake good or bad, or respond in a manner which makes the other scales of doubtful validity (Kelly, 1965).

THEORETICAL ASPECTS OF THE CPI

The CPI is designed for the assessment and description of inter-personal behavior. The concepts involved are intended to provide a description and analysis of personality in everyday life and social interaction (Gough, 1965a, p. 294). Gough theorizes that these "folk concepts" emerge from interpersonal behavior, are immediately meaning-ful, universally recognized, and relevant to the ongoing processes of human behavior in all cultures and societies (Gough, 1968c, pp. 56-58; Gough, 1965a).

The CPI has been scaled to describe current behavior (Gough and Heilbrun, 1965) and to forecast behavioral outcomes. Gough (1964c) questions whether positive outcomes as personal achievement can be predicted from measures of clinical disturbance, anxiety, and distress. He proposes that personal adequacy is not synonomous with the absence of pathology but is related to positive achievement-oriented dimensions of personality which are capable of measurement.

Since Gough (1968c, p. 65) states that the purpose of each scale is "to predict what an individual will do in a specified context, and/ or to identify individuals who will be described in a certain way," the distinction must be made between this and the more common goal in inventory measurement, that of trait specification. For example, an elevated score on the scale for social status does not demonstrate the presence of a "trait" of social status but rather that one possesses dispositions leading toward such attainment or that his outlook or

viewpoint is similar to people of high status. Similarly the occupational scale of computer programmer on the Strong Vocational Interest Blank (Strong, 1959) is not intended to define a unidimensional vocational interest trait of computer programmer. Rather, a high score on this scale indicates the subject's similarity in viewpoint and outlook on a variety of human activities with other computer programmers.

While the CPI may seem pretentious in its presentation of 18 scaled variables, the test author (Gough, 1965) sees his system of concepts as an "open" system which can change by the addition, elimination, or interaction among selected scales. Its purpose is to reflect interpersonal adjustment by a sufficient number of variables so that all major forms of behavior can be forecast.

The CPI manual (Gough, 1957) offers suggestions for interpretation of the scale scores on the profile sheet: (1) consideration of the overall elevation of the scales in relation to the general norms; (2) concern for high or low scale groups; (3) examination of the interaction between the more extreme scores and whether such reinforce or ameliorate one another; (4) study of the unique features of the profile, and (5) a consideration of an individual's scale scores about his own "personal mean."

RESEARCH APPLICATIONS OF THE CPI

It seems reasonable to assume that certain personality characteristics are related to successful employment. The capacity to organize

one's resources into goal-directed, productive behavior which stresses
the disciplinary implications of developing job skills and conforming
work habits should have such a relationship to the potential for com-
petitive employment. The CPI supposedly taps these personality dimen-
sions. CPI studies on personality characteristics which may be related
directly or indirectly to employment potential are reviewed under the
following groupings: achievement motivation, occupational training
criteria, academic achievement, personal functioning, and cross-cultural
applications.

For brevity, the CPI scales of consequence identified in the in-
vestigations reviewed are reported in the tables following each group-
ing of studies. It should be noted that an occasional scale becomes
relevant because of a negative weighting or low scale score in the
pattern of most predictive scales identified by multiple regression
equations. For example, a negative coefficient is frequently assigned
to the Good impression, or social desirability scale in regression
equations.

Achievement Motivation

The following studies report the relevance of the CPI scales to
the measurement of achievement motivation. Table 2.1 summarizes the
scales which the authors for each study considered relevant.

Leadership is an interpersonal behavior which is an appropriate
criterion for measurement with the CPI scales. Several investigators

report evidence of elevated CPI protocols being associated with inde-
pendent ratings of leadership. Liddle (1958) found highly significant
correlations between ratings of leadership and total CPI elevations.
Johnson and Frandsen (1962) found similar, elevated profiles in their
comparisons of 50 student leaders and 50 randomly selected nonleaders
at the college level. Carson and Parker (1966) grouped 164 college
males into 3 categories of leadership, past presidents of student
bodies, former class presidents, and prior social group presidents.
Significant $\underline{F}$ ratios distinguished the first group from the remaining
two groups.

Gough (1969) developed a leadership index on a group of high
school students designated as outstanding in that personal characteris-
tic. On 11 CPI scales 90 males and 89 females scored significantly
higher than controls. Biserial correlations of his regression equa-
tion with leadership versus nonleadership dichotomies were .45 for
males and .44 for females. The Good impression scale received a nega-
tive weighting in the equation which excludes the desire to please from
the "leadership" equation.

Megargee, Bogart, and Anderson (1966) found that Dominance scale
scores reflected situations of initiative with simulated industrial
tasks.

Goodstein and Schrader (1963) empirically developed a managerial
scale from items which reliably classified the total managerial group
from men-in-general and differentiated personnel at three different

levels of management. The scales contributing the most items to the scale are likewise listed in Table 2.1.

Rawls and Rawls (1968) studied differences between 30 highly successful and 30 less successful executives with two personality measures, the CPI and a Biographical Information Blank. Significantly higher CPI scores were found on eight CPI scales. It is important to note that the less successful group scored significantly higher on the Self-control and Femininity scales. The biographical information corroborated the findings of the personality scales.

Schwartz, Dennerll, and Lin (1968) contend that the employability of persons with epilepsy must be conceived of from a multidimensional viewpoint. They found five CPI scales to be associated with current employment status along with intellectual and neuropsychological measures.

Occupational Training Criteria

Selected studies concerned with predicting excellence in occupational training are reviewed in this section. Table 2.2 summarizes the relevant scales identified in these studies.

Gough, Durflinger, and Hill (1968) found selected CPI scales useful in predicting student teacher effectiveness. Scales selected by a regression equation in their analysis correlated .44 on a Cross-Validation sample with higher and lower rated student teachers. Hill (1960) found the CPI scales useful in measuring the relationships

TABLE 2.1

CPI SCALES RELATED TO ACHIEVEMENT MOTIVATION

Reference	Relevant Scales																	
	Do	Cs	Sy	Sp	Sa	Wb	Re	So	Sc	To	Gi	Cm	Ac	Ai	Ie	Py	Fx	Fe
Johnson & Frandsen (1962)	x	x				x							x		x			
Carson & Parker (1966)	x				x									x				
Gough (1969)	x				x	x					x			x				
Megargee, Bogart & Anderson (1966)	x																	
Goodstein & Schrader (1963)		x			x					x			x	x				
Rawls & Rawls (1968)	x	x	x	x	x										x	x		
Schwartz, Dennerll & Lin (1968)	x	x		x	x			x							x		x	

TABLE 2.2

CPI SCALES RELATED TO OCCUPATIONAL TRAINING

Reference	Relevant Scales																	
	Do	Cs	Sy	Sp	Sa	Wb	Re	So	Sc	To	Gi	Cm	Ac	Ai	Ie	Py	Fx	Fe
Gough, Durflinger & Hill (1968)								x										
Hill (1960)											x		x			x	x	
Query (1966)		x		x	x					x			x					
Gough & Hall (1964)		x		x						x		x	x				x	
Watley (1968)								x		x							x	
Southern & Plant (1968)			x						x					x	x			x

between personality characteristics of student teachers and teacher excellence.

Query (1966) used the CPI scales to distinguish "successful" from "unsuccessful" seminary candidates.

In the absence of effective measures predicting performance in medical training, Gough and Hall (1964) developed a regression equation with CPI scales having a predictive validity of .66 in an initial sample and .46 in a cross-validating sample of 63 persons. Their equation of "medical promise" is described as stressing unselfishness and consideration for others rather than need achievement, compensatory striving, or scholastic attainment.

Watley (1969) followed the educational and career progress of highly gifted students. Those who made the least career progress differed from their opposites by scoring lower on three CPI scales. It is noteworthy that those who progressed least scored highest on the Flexibility and lowest on the Femininity scales.

Southern and Plant (1968) found that their group of very bright adults scored significantly higher than the normative samples on three CPI scales. These very bright persons scored lower on the Self-control scale.

Academic Achievement

Numerous investigators have used the CPI measures to predict success in academic endeavors. Table 2.3 summarizes the scales reported

TABLE 2.3

CPI SCALES RELATED TO ACADEMIC ACHIEVEMENT

Reference	Do	Cs	Sy	Sp	Sa	Wb	Re	So	Sc	To	Gi	Cm	Ac	Ai	Ie	Py	Fx	Fe
Bowman & Matthews (1960)		x					x	x				x	x	x	x			
Gough (1966b)		x				x	x	x	x	x	x	x	x	x	x			
Gough (1964a)							x	x			x		x	x	x			
Snider (1966)							x	x			x		x	x				
Gough & Fink (1964)							x	x			x		x	x			x	
Pierce (1961)							x			x			x	x	x			
Fink (1963)													x	x	x			
Gill & Spilka (1962)								x					x					
Gough (1964b)			x	x			x		x		x	x	x	x	x	x		
Rosenberg, McHenry, Rosenberg & McNichols (1962)	x	x		x	x	x	x			x		x	x	x	x	x		

TABLE 2.3 (Concluded)

Reference	Do	Cs	Sy	Sp	Sa	Wb	Re	So	Sc	To	Gi	Cm	Ac	Ai	Ie	Py	Fx	Fe
Holland (1959)		x					x	x					x					
Domino (1968)													x	x				
Gough (1968b)	x						x	x		x			x					
Norfleet (1968)							x	x		x			x			x		

as being relevant.

Bowman and Matthews (1960) report that CPI testing at the 10th grade level differentiated 55 high school dropouts from 112 graduates who were matched for IQ and socio-economic status. Gough (1966c) studied the power of the CPI scales to identify dropouts from a large sample of high school students. He developed a regression equation which optimally selected the most differentiating combination of scales. Maxwell (1960) found seven CPI scales which significantly forecast graduation versus dropping out from college in a group of 400 male students equally divided between graduates and dropouts.

Gough (1964a) studied large samples of high school students from 11 states and made a cross-cultural validation in four Italian schools. His regression equation stressed the relationship of high school achievement to internalized value systems in which self-discipline, control of impulse, and adherence to value are important. The achievement motive, both adaptive and independent, were emphasized. The Intellectual efficiency scale supported the cognitive ability in grade-point average. The negative weighting on the Good impression scale discourages the undifferentiated desire to please.

Snider (1966) used Gough's (1964a) regression equation to identify high school achievers with an overall percentage of 65% correct "hits." Snider's regression equation, coincided remarkably with that developed by Gough (1964a). Gough and Fink (1964) studied the ability of CPI scales to forecast grade point averages among students of average

ability. Fourteen of 18 CPI scales correlated significantly with grade

point averages when applied to subjects in the cross-validation sample

and a .55 coefficient was obtained with an unselected sample. Pierce

(1961) identified more positive personality characteristics among high

achievers with the CPI. Fink (1963) identified 52 CPI items which

differentiated achievers from underachievers at the .01 level of con-

fidence.

Gill and Spilka (1962) matched groups of Mexican-American high

school students on IQ. Significantly differentiating CPI scales des-

cribed the achievers as more mature than their underachieving peers.

Lessinger and Martinson (1961) found CPI scales useful to assess

psychological maturity among gifted students and concluded that chrono-

logical age norms are not completely useful for the gifted since they

differ strikingly from their contemporaries.

Other investigators have found the CPI to forecast success in

specific courses. Keimowitz and Ansbacher (1960) report 13 scales

which differentiate achievers from underachievers in mathematics.

Gough (1964b) found the Achievement via independence scale to be the

best single predicter of achievement defined as course grades in large

samples of introductory psychology students. His regression equation

on a cross-validation sample was .41. Rosenberg, McHenry, Rosenberg,

and Nichols (1962) predicted academic success or failure of students

in three military courses. They found final grades and seven CPI

scales to correlate with .01 significance. Their predictive equation

emphasizes both intellectual and motivational factors in determining academic success.

Holland (1959) studied finalists of the National Merit Scholarship Corporation and found that CPI scales yielded predictive validities significantly superior to those derived from aptitude scores. These students described themselves on the CPI as more socially introverted, responsible, mature, and conforming to recognized societal standards than their underachieving peers.

Domino (1968) studied the interaction between achievement motivation and the demands of the environment, defined as scholastic achievement. He supported his hypothesis that conforming and independent achievement motivation, as measured by the CPI, are related to scholastic achievement.

Gough (1968a) used CPI scales to forecast college attendance by high ability high school graduates. He reports predictive validities with his regression equation of .51 and .37 for males and females, respectively, and .52 for unselected subjects in Cross-Validation. Similar to his earlier study, (Gough, 1964a) the Good Impression scale received a negative weighting suggesting unconcern for social desirability among high achieving students.

Norfleet (1968), studying gifted university women, found five CPI scales which differentiated achievers from underachievers. She notes that her two groups also described themselves differently on the Adjective Check List (Gough, 1960).

Personal Functioning

The CPI has been found useful as a diagnostic measure of personal functioning in counseling procedures and as an indicator of asocial behavior. The CPI scales involved in these studies are noted in Table 2.4.

Goodstein, Crites, Heilbrun, Jr., and Remple (1961) used the CPI in a university counseling center because of its applicability to a relatively stable, nonpsychiatric population. They found it useful for distinguishing personal adjustment cases from vocational-educational problem cases, and for separating both samples from control groups.

Levanthal (1966) developed an Anxiety scale with 22 CPI items on a university counseling center population. Additional data (Levanthal, 1968) indicated that persons with high scores on this scale had poorer prognosis in counseling, required more interviews to termination, and improved at a slower rate. He reports negative correlations between the Anxiety scale and certain CPI scales and suggests that high scores on the Anxiety scale are erratic, conflicted, and self-centered.

Finney and Van Dalsem (1969) report improved measures on eight CPI scales after group counseling with 68 academically gifted but under-achieving high school students. The counseled students were rated by teachers as more cooperative in the classroom and absent from the classroom less than the controls. There were no observed differences nor improvements in grade-point averages nor in the scores of the California Study Methods Survey.

TABLE 2.4

CPI SCALES RELATED TO PERSONAL FUNCTIONING

Reference	Relevant Scales																	
	Do	Cs	Sy	Sp	Sa	Wb	Re	So	Sc	To	Gi	Cm	Ac	Ai	Ie	Py	Fx	Fe
Goodstein, Crites, Heilbrun, Jr. & Rempel (1961)	x	x	x	x	x	x		x	x	x	x		x	x	x	x		
Levanthal (1966)						x		x				x						
Levanthal (1968)						x		x				x						
Finney & Van Dalsem (1969)		x		x				x		x			x	x		x		
Peterson, Quay & Anderson (1959)								x										
Gough, Wenk, & Rozynko (1965)				x				x	x			x						
Stein, Gough & Sarbin (1966)								x										
Gough (1966c)	x						x	x		x	x	x					x	

The Socialization scale of the CPI has been used successfully in identifying asocial behavior. Peterson, Quay, and Anderson (1959) used the Socialization scale of the CPI with 239 inmates of a boys' training school and a group of nondelinquent controls. The scale correctly identified over 70% of the members from both groups. Significant differences were found between delinquent recidivists and first offenders, and between "good citizens" and "disciplinary problems."

Gough, Wenk, and Rozynko (1965) report that a combination of both demographic data along with CPI scales provide the best prediction of parole outcome in their sample. Stein, Gough, and Sarbin (1966) found three main dimensions in the 54 items of the Socialization scale, each of which differentiated significantly between delinquents and nondelinquent males.

Gough (1966a) compared large samples of nondelinquent males with institutionalized delinquents. Seventeen of the 18 CPI scales differentiated significantly between the two groups. The Socialization scale was most discriminating. A six variable regression equation produced a point-biserial coefficient of .63 on delinquent and nondelinquent Cross-Validation groups. Screening efficiency with the equation reached 90% and 82% in identifying delinquents and nondelinquents, respectively.

A number of CPI studies focusing upon social maturity and socialization have been carried out cross-culturally and are reviewed in the following section.

Cross-cultural Applications

Translations of the CPI into other languages have made possible cross-cultural studies with this instrument. Gough (1968b) suggests that asocial behavior is a cultural universal found wherever people live and work together. Although the definitions of asocial behavior may differ, the psychological dispositions underlying social conformity and adaptation may be constant and psychologically measurable. Further, Gough (1968b) discusses methodological issues encountered in translation and cross-cultural measurement. Table 2.5 identifies the scales concerned in the cross-cultural studies reviewed below. Initially it should be noted that some cross-cultural investigations with the CPI were discussed above in the contexts of other criteria (Gough, 1964a; Gill and Spilka, 1962; Gough, 1966c).

Gough (1964c) reports that he was able to predict the achievement motive in Italian schools from personality appraisals with the CPI.

Mizushima and DeVos (1967) found that despite cultural differences between American and Japanese youth there were remarkable similarities in social attitudes related to delinquent activity in both cultures. Japanese delinquents scored significantly lower than nondelinquents on three scales.

Gough, DeVos, and Mizushima (1968) used Gough's (1966c) equation with a Japanese sample. A predictive coefficient for the delinquent versus nondelinquent dichotomy was .69 and the authors identified a cutting score which classified 88.6% of the subjects correctly.

TABLE 2.5

CPI SCALES RELATED TO CROSS-CULTURAL APPLICATIONS

Reference	Relevant Scales																	
	Do	Cs	Sy	Sp	Sa	Wb	Re	So	Sc	To	Gi	Cm	Ac	Ai	Ie	Py	Fx	Fe
Gough (1964a)							x	x			x		x	x	x			
Gill & Spilka (1962)								x					x		x			
Gough (1966c)	x						x	x		x	x	x					x	
Gough (1964c)													x	x			x	
Mizushima & DeVos (1967)							x	x	x									
Gough, DeVos & Mizushima (1968)							x	x		x	x	x					x	
Gough (1965b)								x										
Gough & Sandhu (1964)								x										
Gough, Chun & Chung (1968)																	x	

The Socialization scale of the CPI was translated into eight lan-
guages in ten countries and administered to large numbers of delinquent
and nondelinquent persons. Using an optimum cutting score of twenty-
eight, 78% of the males and 85% of the females were correctly classified
according to the delinquent versus nondelinquent dichotomy (Gough,
1965b). Gough and Sandhu (1964) report that translations of the Social-
ization scale into Hindi and Punsabi were given to delinquents and
college students in India. Behavioral ratings correlated .70 with
Socialization scale scores.

Gough, Chun, and Chung (1968) found that a Korean translation of
the CPI Femininity scale differentiated females from males at the .001
level of confidence in Korean adolescents.

The effectiveness of the CPI in cross-cultural studies supports
the likelihood of its potential for application to handicapped popula-
tions such as the visually impaired.

It should be noted that although not all the studies cited above
bear directly upon employability or employment readiness, these studies
are helpful in outlining some of the diversified applications made with
this instrument and suggest the kinds of information which may become
available through its use.

Factor Analyses and the CPI

Factor analytic studies of the CPI merit some discussion both in

relation to test profile interpretation and psychometric test theory.

Initially it should be noted that Springob and Struening (1964) report a personal communication from Gough relative to four factor analyses he conducted prior to publication of the test and arrangement of the Profile Sheet. Springob and Struening state further that Gough supported his first two scale groupings on those findings, while the scales in Classes III and IV were not intended to be factorially grouped. Gough (1968c) states that his Class III and IV groupings are for diagnostic convenience.

The available studies suggest that the reliable variance measured by the 18 scales of the CPI can be explained by four or five dimensions. It is important to note that the available factor analyses were made on restricted samples of student populations with varying factor analytic techniques. Consequently, extended comparisons of results between studies are difficult. These valuable but limited findings neither establish the dimensional structure of the CPI scales nor encourage unguarded generalization.

Mitchell and Pierce-Jones (1960) identified four orthogonal factors with a somewhat different combination of scales than those presented by Gough. Their analysis on a college population found the strongest factor to include the CPI scales of Self-control, Good impression, Achievement via conformity, Well-being, Tolerance, and Responsibility. This Factor I was designated Adjustment by Social Conformity. Crites, Bechtoldt, Goodstein, and Heilbrun (1961) confirmed

these results and designated this factor Good Impression, after the
scale with the highest loading. This factor presumably represents the
social stereotype of a stable individual who functions in a socially
acceptable manner. Springob and Struening (1964) found close agreement
as these scales emerged from a rotated factor matrix while studying a
high school sample. They designated this factor Self-control since
that scale is almost a pure measure of that factor. Nichols and Schnell
(1963) approximated this factor on college students and designated it
Value Orientation. Notice is made that in these studies the Well-being
and Achievement via conformance scales are factorially drawn from
Gough's Class I and III groupings.

Crites, Bechtoldt, Goodstein, and Helibrun, Jr. (1961), similarly
to Mitchell and Pierce-Jones (1960), found five of Gough's six Class I
scales to represent a second factor. These scales are Dominance,
Capacity for status, Sociability, Social presence and Self-acceptance.
Their designation of this factor was Dominance, the scale with the
highest factor loading. Mitchell and Pierce-Jones (1960) named this
factor Social Poise or Extroversion. Springob and Struening (1964)
claim to have obtained similar findings while studying a college sample.
Nichols and Schnell (1963) approximated this factor and titled it
Person Orientation.

Crites and associates (1961) contend that these two factorings
measure distinctly different modes of adjustment. The first factor
defines an attitude of compliance, cooperation, and adaption of self

to environment. The second factor underlies adjustment to changes in external reality rather than the self, stressing a disposition to direct and manipulate the environment and others.

Further comparisons of the factor studies provide diminishing agreement among themselves. For example, the controid analysis of Mitchell and Pierce-Jones split the third factor of Nichols and Schnell into two. They entitled the first division Super-Ego Strength because of Gough's descriptions of the characteristics associated with those scales loading this factor, Communality, Socialization, Femininity, and, again, Responsibility. They identified a fourth factor which comprised the scales of Achievement via independence, Flexibility, Intellectual efficiency, and, again, loadings on Tolerance, Social presence, and Capacity for status. This grouping was designated Capacity for Independent Thought and Action. Springob and Struening also found a factorial association between the Flexibility and Achievement via independence scales in their Factor C.

The studies reviewed above indicate that 18 independent aspects of personality are not measured by the 18 scales. Gough suggests the "open-ended" quality of the inventory and refers to the forecast of a certain behavior either by a single scale or a meaningful combination of scales (Gough, 1968c). Crites and associates (1961) contend that it is economical and efficient to use a reduced set of six reference scales which exhibit homogeneous correlation matrices for three groups of subjects. These scales include the measures of Dominance, Good

impression, Intellectual efficiency, Flexibility, Femininity, and Communality. These investigators feel that these six reference scales predict most of the reliable variance in the other CPI measures and provide more concise definitions of the variables assessed by the CPI.

Summary

This chapter reviewed some psychological implications of blindness and the role of vision from the psychoanalytic view. Studies on personality measurement of the blind were found to be limited in scope and almost devoid of systematic attempts to relate test results to prediction of performance criteria.

Selected studies concerned with the California Psychological Inventory as a measure of interpersonal and intrapersonal functioning, social maturity, and achievement motivation were reviewed. The demonstrated usefulness of the CPI with various nontest criteria suggest its value as an instrument for exploring whether personality traits, as measured by the CPI, will identify employment potential among the visually impaired.

CHAPTER III

DEVELOPMENT OF THE PROBLEM

Research reviewed in the previous chapter suggests that the CPI
may be a suitable personality measure for use with a visually impaired
population. It is a relatively easy test to take, in that its "folk
concepts" do not engender undue apprehension. It can be administered
to blind subjects by volunteer reader or tape recording and card sort
for auditory presentation (Bennett and Rudoff, 1957). The CPI is
scaled for measuring interpersonal traits which have a broad relevance
to personal and social adequacy, social maturity, achievement, and
goal-directed behavior.

A strong recommendation for the CPI is that it is extensively re-
searched on a wide variety of populations. This immediately provides
opportunity for comparisons between blind and sighted populations.
CPI profiles of blind persons should provide the practitioner with
meaningful descriptions of his clients and how each compares with the
sighted. CPI profiles of the blind should provide more definitive
information relative to the implied contention that there is a per-
sonality configuration which is characteristic of blind persons.

Another recommendation for use of the CPI with the visually im-
paired is that the CPI profile analysis offers descriptions of per-
sonality traits in everyday concepts which are readily meaningful and
comprehensible to the user. While more subtle implications may be

apparent to the skilled interpreter, the main thrust of the scales

provides descriptions of interpersonal qualities which are both readily

communicated to and understood by the client in counseling sessions.

Finally, preliminary impressions of the CPI gained by its use

with various disability groups at the Rehabilitation Institute, Detroit,

Michigan, have been encouraging. There are certain limitations which

should be noted. These are discussed in the following section.

Limitations Of The CPI

The following questions may be raised regarding the suitability

of using the CPI in this study: limitations of "objective" personality

inventories, response sets and the CPI, and the appropriateness of

employing a "sighted" test with a visually impaired population.

SOME LIMITATIONS OF "OBJECTIVE" PERSONALITY INVENTORIES

Certain methological issues are involved in the attempted measure-

ment of personality traits by inventory-type measurements. Initially,

there was slow progress in this area. The literature suggests some

reasons for this. Hathaway (1965) proposes that such may be due to the

lack of a convincing theory of personality, undeveloped psychometric

methodology, and difficulty with developing a satisfactory diagnostic

system of personality traits.

The "objective" designation of paper and pencil inventories, in

contrast to projective techniques, infers an objective scoring system

under universally reproducible situations with a standardized treat-

ment of test data. Yet, the term "objective" raises an interesting

question, whether such tests are truly objective (Bass and Berg, 1959).

The relationship between personality itself and inventory mea-

surement poses issues as to what is meant by personality. The defi-

nitions of personality tend to vary with theoretical biases (Hall and

Lindzey, 1957, pp. 1-28). Nunnally (1967, p. 470) suggests the

measurement of personality traits be addressed to three broad classes

of traits: Social characteristics, Motives (needs or drives) and

Adjustment versus maladjustment.

Hathaway (1961) suggests that personalities do not exist in a

void but in relation to person-environment interaction. In this

sense he proposes that personality tests are not culture-free, and

that normative data depends on some culturally accepted value system

for a basis of personality measurement.

Another fundamental concern to personality inventories is the

question of a developmentally changing personality or a constant

personality structure. Hathaway (1965) argues that cultural values

obviously change and the person also. He suggests that there are

both intrinsic and social aspects to personality which are measurable

from the focus of what the person is and as observers see him. He

posits that either some factors of personality are stable and others

variable, or that all factors have both stable and variable aspects.

This middle posture respects the position of psychoanalytic viewpoint

which supports the determination of personality structure at an early

age and the requisite of intensive psychotherapy to effect changes. It

likewise considers the position that personality changes with daily

experience and is modified by age and learning experiences which allow

for man's adaptability to changing environments. He does not see

personality measures as witnessing an absolutely constant personality

structure, and if such did, personality measurement would seem to be

of little help in evaluating persons in times of situational stress.

At the same time, personality inventories which are too sensitive to

momentary change could be vitiated by momentary states and belie the

recognition that individuals do indeed demonstrate some stability of

personality traits. Hathaway (1965) stresses that the primary

contribution of the personality profile is in its predictive value.

Nunnally (1967, pp. 472-513) offers a review of the methods to

find and measure general traits of personality. He defines personality

traits as a "measurable dimension of behavior," which is measurable

either dichotomously or in finer gradations. He sees traits as varying

in generality from specific habits, such as smoking rather than non-

smoking, to very broad dimensions of behavior, such as extroversion as

opposed to introversion. He discusses personality traits relative to

the nomothetic approach which strives to measure personality charact-

eristics of all people in terms of profiles of quantifiable traits. The ideographic or personalized point of view denies factors among personality characteristics and stresses that personality traits are so individualized that each is unique to the individual possessing it.

The methodological choice of inventory items in personality test construction is an important consideration. Content validation or face validity refers to the selection of inventory items made on the basis of their relation to self-perceived or self-reported problems or characteristics (Hathaway, 1965); Anastasi, 1968).

Empirical criterion keying is another approach whereby a criterion dimension is defined and inventory statements are assembled according to their capacity to identify those persons demonstrated as possessing the criterion dimension. The criterion dimension must be shown to characterize those persons by some procedure independent of the test instrument (Cronbach, 1960; Gough, 1957, 1968c).

Others have approached item selection by defining constructs on the basis of personality theory and preparing items which bear on traits or dispositions particularly relevant to those constructs (Cronbach, 1960).

A final method of selecting inventory items has been through internal consistency or factor analysis. In this method items are selected on the basis of their relationship to each other and to a theoretical relationship to some personality trait (Nunnally, 1967,

pp. 210-211; pp. 476-479).

In spite of the limitations currently inherent in "objective"

personality assessment, this technique remains important for the visu-

ally impaired because projective techniques for the blind have not been

investigated (Wachs, 1966).

RESPONSE SETS AND THE CPI

An overview of personality inventory measurement requires con-

sideration of the possible influence of consistent responses determi-

nants or "sets" which result from item or inventory style rather than

specific item content.   The question arises whether self-report

inventories are indeed dominated by such response styles as acquies-

cence and social desirability.   This issue was initially studied in

detail by Edwards (1953; 1957) and by Jackson and Messick (1958;

1960).   Investigations relative to response set with the CPI may be

particularly relevant at this point.

Jackson (1960) reports evidence suggesting that acquiescence and

social desirability may account for a considerable amount of variance

of the CPI.   Dicken (1960) reports trait-simulation experiments with

naive college students and psychologists who were not particularly

well versed with the CPI.   He concludes the CPI is a sufficiently

subtle instrument for resistence to differential bias such as social

desirability and the detectability of simulation.   A cutting score

on the validity scale, Good impression, identified biased records with

a high degree of efficiency among naive college students. The psychologists were able to simulate their scores distinctively without changing their validity scores sufficiently to permit efficient detection. He states the CPI appears more subtle by all criteria considered than the Edwards Personal Preference Scale (Dicken, 1959).

Canter's (1963) simulation studies of the CPI are likewise supportive of the position that the CPI is not susceptible to undetectable distortion. Canter used some subjects who were not functioning well such as groups of poorly and better adjusted alcoholics and ward aide applicants instead of college students. He found that under "fake good" instructions all subjects could improve their test profiles but the subjects' actual life adjustment limited their capacity to improve their test pictures. He suggests that while conscious simulation is detectable, those who obtain higher Good impression scores have a potential for the interactional expectancies of socially adequate behavior (Gough, 1960a). He suggests that this is a meaningful aspect of the "real" personality and not a response set.

Similar support is furnished by Lichtenstein and Bryan (1966) who used the Marlowe-Crowne Social Desirability Scale (M-C SDS) and found that high scorers on the M-C SDS were better adjusted than low scorers. They found eight CPI scales which yielded significant, replicated correlations. The scales of Good impression and Self-control were strongly related, followed by Achievement via conformity, Responsibil-

ity, and Well-being. Consistent with Gough's (1957) expectations, the M-C SDS is most strongly associated with measures of socialization, maturity, and responsibility. Corroborative evidence is furnished by Dicken (1963b) who was unable to improve the validity of nine CPI scales when "correcting" for the response biases of social desirability and acquiescence over six independent samples. Dicken (1963a) validated the Dominance and Intellectual efficiency scales with convergent and discriminant validity techniques. When social desirability was controlled by means of a 32 item CPI social desirability scale, the overall discriminant validity was not improved.

Pumroy (1962), using the Edward's Social Desirability Scale (Edwards, 1957) with the CPI, found that only five of the 18 CPI scales correlated with the SD scale in a positive direction. He indicated some correlation was to be expected because more positive adjectives are associated with elevated CPI scales. He contends with Gough (1957) that the empirical criterion-keying of most CPI scales facilitated more "subtle" items and minimized the effect of social desirability. He concluded that social desirability is involved with the CPI but it is not as important a factor as with many other personality tests.

In summary, the current research suggests that the response sets of social desirability and acquiescence do not pose a serious problem with the CPI. Further, conscious simulation of the CPI is felt to be detectable and may lend support to the identification of certain

personality characteristics.

THE APPROPRIATENESS OF A "SIGHTED" TEST

A further question arises regarding the suitability of a "sighted" test for use with a visually impaired population. Bauman and Yoder (1966) take the position that a visually impaired population can be better evaluated with test items which are not only chosen specifically for blind subjects but which have a content validity corresponding to the varying problems presumed to confront blind people. Consequently, the variables felt to be measured by such items lend themselves to scales purporting to measure "adjustment to blindness" variables. This position is accompanied by the assumption that blindness presents the visually impaired with a potential for unique differences in personality development which requires an equally unique instrument for measurement. If one is not prepared to accept this assumption, an alternate option suggests the use of a widely standardized instrument, such as the CPI, which has been used with a variety of behavioral dimensions relating to interpersonal effectiveness, social maturity, and achievement potential. This study was undertaken on this assumption.

Statement Of The Problem

The purpose of this study is to evaluate the usefulness of the CPI in predicting the employment status of visually impaired males of

working age. The study involves two phases, Standardization and

Cross-Validation.

STANDARDIZATION PHASE

Statistical treatment of the Standardization data was undertaken

to meet the following three objectives.

1. To determine whether any CPI scales discriminate between

the two groups of Standardization subjects who are differentiated by

an employed-unemployed dichotomy. The null hypothesis (Johnson, 1967)

can be stated as follows:

H_o = The employed and unemployed subjects of the Stan-

dardization sample will not differ on CPI scale

scores.

2. To determine by empirical item-analysis whether any CPI

items significantly discriminate between the employed and unemployed

subjects. The null hypothesis can be formulated in this manner:

H_o = The employed and unemployed subjects of the Stan-

dardization sample will not differ on the direction

of item response.

If the null hypothesis is rejected, the significant items can be

assembled into a separate experimental scale, designated the Employment

Key, and analyzed in conjunction with the standardized CPI scale

scores.

3. On the basis of results obtained in Steps 1 and 2, a

determination can be made whether any scale or pattern of scales

efficiently predicts the dichotomous criterion of employment versus

unemployment among the Standardization subjects.

CROSS-VALIDATION PHASE

In order to determine the validity of the findings derived from

the CPI data of the Standardization subjects, the findings will be

applied to Cross-Validation subjects. CPI data from a separate group

of subjects was obtained during previous administrations.

The procedures employed and the results obtained are reported

in the chapters that follow.

CHAPTER IV

METHOD

This chapter presents the experimental design of the study. It compares the essential demographic characteristics of the employed and unemployed subjects for both the Standardization and Cross-Validation samples. The instruments used for interviewing and testing the Standardization sample are discussed. Sources of data for the Cross-Validation subjects are identified. An account of the procedures includes the administration of the instruments, the analyses of the data, and the application of the findings to a separate group of Cross-Validation subjects for evaluation of the findings of the Standardization procedures.

Subjects

STANDARDIZATION SAMPLE

In order to determine whether the CPI can be effectively used to identify personality differences between the employed and the unemployed blind, two groups of subjects were selected: a substantially employed group and a chronically unemployed group. These groups will comprise the Standardization sample.

This study was designed to focus upon the employed blind who had no specific professional training. Therefore, college graduates were

excluded with the exception of six who were employed in an occupation

which did not require a college degree.

Criteria for Selection

The total Standardization sample included 101 males between the

ages of 21 and 61, with a visual impairment of such severity that they

were eligible for vocational rehabilitation services, Public Assistance

(Aid to the Blind), or disability retirement benefits. The sample in-

cluded two sub-groups: 51 subjects employed continuously in a "full

time" capacity, i.e., 40 hours or more per week, during the past two

years, and earning a minimum of $200 per month; and, 50 subjects unem-

ployed for at least the past 2.5 years.

In order to focus upon the employment-unemployment dimension and

avoid possible variance from other sources, the following subjects were

excluded: (1) those who had an additional, employment handicapping

condition, such as orthopedic, severe diabetic, emotionally disturbed,

mentally retarded, or similarly impaired which may markedly limit em-

ployment potential, particularly in combination with blindness; and

(2) the recently blinded, i.e., those who sustained visual impairment

since 1967.

Selection of Subjects

Subjects for the Standardization portion of the study were selec-

ted from the following sources:

1. Names in the file of the State of Michigan Division of

Services for the Blind; a letter was sent to a number

of clients in the "inactive" files requesting their co-

operation. Interested subjects were asked to sign a

Release of Information form giving their consent to

have the investigator initiate contact. A copy of this

form may be found in Appendix A;

2. Eligible subjects included in the Scholl, Bauman, and

Crissey (1969) research project;

3. A list of names furnished by the Vocational Consultant

at the Metropolitan Society for the Blind, Detroit;

4. The subjects who volunteered the names and phone

numbers of acquaintances, or in some instances

actively worked to locate subjects;

5. Clients recently evaluated in the Psychology Department

at the Rehabilitation Institute, Detroit. It was nec-

essary to utilize this latter resource in order to ob-

tain the 50 unemployed subjects. This group, when

tested, was receiving extensive evaluations in the

areas of personal adjustment, mobility, employability,

vocational selection, and communication skills.

Table 4.1 summarizes the sources of subjects.

Much difficulty was encountered in identifying the group of unem-

ployed subjects. Initially the unemployed group was intended to sample

a relatively young, chronically unemployed population embracing persons

TABLE 4.1

SOURCES OF SUBJECTS

Source	Employed		Unemployed	
	N	%	N	%
Michigan Services for the Blind	10	20	3	6
Scholl, Bauman, & Crissey Research (1969)	14	27	5	10
Metropolitan Society for the Blind, Detroit	3	6	5	10
Subjects in the Current Study	24	47	25	50
Rehabilitation Institute, Detroit	0	0	12	24
Totals	51	100	50	100

who were either reluctant to initiate a vocational training program for which they were judged to be capable, or unable to complete a program, or trained for work but unable to assume employment. Many unemployed blind persons were ineligible for this study because of multiple handicaps which perhaps rendered them unemployable for reasons other than blindness. Others were at or near retirement age. Most striking, however, was the repeated experience that the unemployed were no longer at the last recorded phone number or address despite relatively recent referral information. This experience may suggest that a proportion of the unemployed blind are, for whatever reasons, a transient segment of

the population whose economic hardship may have forced them into an unstable life-style, or vice versa. Finally, it was observed that the unemployed were conspicuously less willing to participate in the testing. Their reluctance may have been related to an unfounded fear that in some way the testing might jeopardize their Social Security Disability payments or Public Assistance funds by challenging their status as "unemployable."

Table 4.2 provides a general breakdown of the major occupational group divisions of the employed subjects in the Standardization sample. A breakdown by specific occupation may be found in Appendix B (Table B.1).

TABLE 4.2

OCCUPATIONAL GROUPINGS
OF THE EMPLOYED STANDARDIZATION SUBJECTS

	N	%
Professional and managerial	4	8
Clerical and sales	18	35
Service	4	8
Agriculture, fishery, forestry	0	0
Skilled	4	8
Semiskilled	17	33
Unskilled	4	8
Totals	51	100

Description of Standardization Subjects

Table 4.3 presents information relative to the years of continuous employment of Standardization subjects at the time of interview along

with their current income. The years of continuous unemployment is

noted for the unemployed group. Data relative to their income were not

available.

TABLE 4.3

YEARS OF EMPLOYMENT AND INCOME
OF STANDARDIZATION SUBJECTS

	Mean	Range
Employed		
Years of continuous employment	14.3	2.8 to 39.7
Annual income for 1969	$6,357	$2,876 to $14,100
Unemployed		
Years of continuous unemployment	9.8	2.7 to 35.4
Annual income		not available

Tables B.2 to B.9 in Appendix B present demographic data com-

paring the two groups in the Standardization sample. The following

statements summarize the major differences:

1. The unemployed group was somewhat older (Table B.2).

2. The employed group included more who were congenitally blind

or lost vision early in life (Table B.3).

3. The employed had a higher level of education, more completing

high school (Table B.4).

4. The employed included more who were able to read some print

while the unemployed tended to be dependent upon braille and auditory

media (Table B.5).

5. In general, the unemployed reported their travel to be limited

to their neighborhoods in contrast to the employed who claimed the
ability to travel to new and distant places (Table B.6).

6. The degree of vision did not seem related to travel ability
(Table B.6).

7. Separation and divorce are more prevalent among the unemployed
(Table B.7).

8. The unemployed sample included a higher percentage of blacks
(Table B.8).

9. The majority of both groups resided in urban areas (Table B.9).

CROSS-VALIDATION SAMPLE

In order to test the predictive validity of the CPI scales and
items which may significantly discriminate between the employed and un-
employed groups in the Standardization sample, an independent group of
subjects was identified on whom the initial findings could be tested.
This sample is designated as the Cross-Validation sample and includes
subjects who were administered the CPI earlier and whose current voca-
tional or educational status could be determined by follow-up contacts.

Criteria and Selection of Subjects

The Cross-Validation sample was drawn from a group of 56 males who
were administered the CPI as part of their evaluation in the Psychology
Department of the Rehabilitation Institute, Detroit, between February
1, 1968, and December 1, 1969. The initial date of this period was
selected because it was when the CPI came into use at the Institute.

The closing date was used as a cut-off so that a minimum of 8 months would elapse between evaluation and follow-up. This interim should provide sufficient opportunity for clients to commit themselves either to productivity, i.e., employment, technical training, college programs, or to continuing unproductivity.

The current status of 56 males was determined by information furnished by Institute staff, personal contacts by the investigator, and the Detroit Office of Services for the Blind. Of this number 11 were employed, 15 were unemployed, 17 were college students; those ineligible for further consideration were two high school students, four who were severely physically disabled, and four who were deceased. A separate criterion group was suggested by Rehabilitation Institute staff to classify three employed subjects. Their employed status was regarded as being uniquely dependent upon extensive interagency cooperation and intense vocational counseling.

Description of Cross-Validation Subjects

Table 4.4 and Tables B.10 to B.15 in Appendix B provide descriptive data on the Cross-Validation sample. The following statements summarize the characteristics of the group:

1. The employed and unemployed do not differ significantly in age (Table 4.4).

2. Proportionately more congenitally blind are in the employed group in constrast to a greater number of recently blinded in the

TABLE 4.4

CROSS-VALIDATION SUBJECTS CLASSIFIED
ACCORDING TO AGE AND CURRENT VOCATIONAL STATUS

Age	Employed	Unemployed	Employed, Separately Classified	College Students
17-21	1	2	0	13
21-25	4	4	1	1
26-30	1	3	2	2
31-40	1	1	0	0
41-50	2	4	0	1
51-61	2	1	0	0
Totals	11	15	3	17
Mean	33.090	32.266	---	---

Mean difference: Employed vs. Unemployed = 0.824
$\underline{t}$ = 0.465 n.s.

*A separate classification for these subjects was suggested
by Rehabilitation Institute staff because their employment
was regarded as dependent upon extensive interagency coop-
eration and intensive vocational counseling.

unemployed group (Table B.10).

3. The employed attained a higher level of education, more com-

pleting high school (Table B.11).

4. The advantage of partial vision appears to be associated with

employability to some extent in this sample (Table B.12).

5. The employed have a somewhat higher IQ than the unemployed

(Table B.13).

6. More blacks are included in the unemployed sample (Table B.14).

7. Proportionately more single persons are in the employed group

(Table B.15).

Instruments

STANDARDIZATION SAMPLE

Two instruments were used to gather data on the subjects in the

Standardization sample: the California Psychological Inventory and an

Interview Form.

California Psychological Inventory

The standardized form of the CPI was administered by tape record-

ing and scored according to the standardized scale keys. Prior consent

was obtained in writing from Consulting Psychologists Press to use the

scales and the Inventory in this research. A listing of the CPI scales,

their abbreviations, and scale classes may be found Appendix C.

Interview Form

An interview form was designed to gather personal and vocational

data including geographical location, marital status, presence or ab-

sence of other disabilities, type and age of onset of visual impair-

ment, academic education, vocational training, vocational history, cur-

rent earnings and hours worked per week if employed, duration of con-

tinuous employment or unemployment to date, and measures of functional

vision and mobility. A copy of the Interview form and set of Coding

Instructions are included in Appendix C. The measure of functional

vision used in the Scholl, Bauman, and Crissey (1969) study was utilized

for this study. The measure of functional mobility was developed by

the investigator. Both measures rely on the subject's self-report.

CROSS-VALIDATION SAMPLE

Demographic data and CPI protocols for the Cross-Validation sample were available from the files of the Psychology Department, Rehabilitation Institute, Detroit. Retrieval and coding of these data were conducted by this investigator.

Verification of the current employment status of each subject was made through the current files of the Comprehensive Services for the Blind at the Rehabilitation Institute, by inquiry at the Detroit Office of Services for the Blind, and/or a telephone contact to the subject by this investigator. No additional measures were employed with this group.

Procedure

ADMINISTERING THE INSTRUMENTS TO THE STANDARDIZATION SAMPLE

This investigator contacted each subject to arrange for the interview and testing. Each session was conducted by this investigator. The length of the session ranged from one hour forty-five minutes to three hours depending upon the subject's varying concerns. The tape recording of the CPI was one hour and 17 minutes in length. Each subject was paid $5.00 for his cooperation. The interview and testing were accomplished between March and June, 1970.

California Psychological Inventory

To provide a standardized presentation of the Inventory items to each person, the entire format of 480 items was tape recorded for presentation to each individual.

A wooden rack of 480 IBM cards, keypunched from 1 to 480, was placed on the table. The subject was instructed to take the top card each time and place it in either the "true" or "false" box before him. Either box was identified with a brailled label and a heavy ink notation. The "true" box on the subject's right was indicated for items with which he agreed, or which were true of him. The "false" box on his left was designated for items with which he disagreed or which he regarded as not true of him. He was further instructed that every tenth card was notched and that before every 10th item on the tape, he would hear: "This card should be notched." He was instructed to notify the investigator if the notched card and the taped statement did not correspond. This method of administration provided an efficient and comfortable presentation of the items. Modification of the ordinary conditions of testing to an oral presentation was found by Bennett and Rudoff (1957) to yield equivalent results.* After the testing the investigator recorded the "true" and "false" card responses on standardized answer sheets. Separate coding of each card was used to reduce the possibility of recording errors. Each answer sheet was scored

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*Personal communication from Harrison G. Gough after the above procedure was described to him.

and verified according to the standardized scales.

Interview Form

Data on the Interview form were recorded after the CPI testing. The data were coded according to the Coding Instructions to facilitate later processing.

ANALYSIS OF DATA FROM THE STANDARDIZATION SAMPLE

After completion of the testing of the Standardization Sample all coded data from the Interview form and CPI protocols were recorded on coding sheets to facilitate keypunching for computer processing of the data. The entire recording process was verified by an independent checker. A total of six errors was identified and corrected. An error count of every 5th CPI scoring sheet was made by the independent checker to determine the error rate of summing the individual scale scores. No errors were found. The 18 variables were keypunched for each subject.

Preliminary Evaluation

Initial group differences were established by analysis of group means and their corresponding t ratios as computed on the Olivetti Programma 101—.

A second test of the overall significance of between group differences was computed by means of the Mahalanobis D^2 statistic as provided by the Discriminant Analysis—Two Groups (BMD04M) program (Dixon, 1968).

The Generalized Distance or D^2 statistic searches for that linear com-
bination of variates which will "maximize" the "between"—group differ-
ences relative to the "within"—group differences. This linear combi-
nation reduces the multiple variables to a univariate measurement and
the overall, maximum discrimination between the two groups is computed
on the single discriminant variate. The advantage of this generalized
distance measurement between the groups is superior to a series of t
tests since simple t tests between sample means lack efficiency in that
they are unable to take into account covariances or interrelationships
of variables and assess their relative power in determining sample dif-
ferences (Anderson, 1966, p. 169). The formula for estimating the
Mahalanobis distance between two populations may be found in Table D.1
of Appendix D.

Development of the Employment Key

An item analysis was made for each of the 480 items in the CPI.
This was accomplished by making a 2x2 chi square contingency table for
each item. The scored direction of each item, true or false, was
weighted +1 or 0 in association with a subject's employed or unemployed
status. The chi square values were then calculated on the Michigan
Terminal System of The University of Michigan Computing Center on an
IBM 360 Model 67-2. A 2x2 chi square program was developed and filed.
Chi square values were processed from a terminal.

Those items reaching a .01 level of significance were combined

into an experimental Employment Key scale and a plastic scoring sheet was made to correspond to the items. Each CPI protocol in the Standardization sample was scored with this Employment Key. Employment Key scale scores were then recorded on the coding sheets along with the 18 standardized CPI scale scores. This 19th variable was keypunched on each subject's IBM data card. This process was likewise verified for each subject to eliminate clerical errors.

Stepwise Discriminant Analysis

The method chosen for a more comprehensive evaluation of the 19 personality variables was that of linear discriminant function which is provided by the Stepwise Discriminant Analysis, BMDO7M, computer program (Dixon, 1968). This multivariate prediction technique is used for purposes of calculating linear discriminant functions on variables, such as test scores, which presumably separate the members of two dichotomous groups. The efficiency of the discriminant functions is then tested by determining how effectively the subjects can be classified into their actual group membership on the basis of their test scores alone. In this model the intent is to determine how effectively the actual group membership of employed and unemployed subjects can be predicted on the basis of their scores obtained on the standardized CPI scales and the newly developed Employment Key scale.

The variables for the discriminant functions are selected according to their respective capacities to account for the unexplained

variance at each step. The feature aspect to this stepwise entry of variables is the elimination of overlapping whereby two or more variables may in effect account for the same variance. For example, it is possible that more than one CPI scale accounts for some or all of the same variance represented by a certain personality trait dimension. At each step the discriminant analysis is repeated and the most discriminating variable is entered into the equations or set of discriminating functions. This technique accounts for the most rapid and effective reduction of the variance between two groups.

The computer program generates linear discriminating functions in a stepwise fashion. Linear discriminating functions are depicted as $Y = a_1 X_1 + a_2 X_2 + \ldots + a_k X_k$ where Y = scores on the discriminant function; $X_1, X_2, \ldots, X_k$ = raw scores on variables; and, $a_1, a_2, \ldots, a_k$ are applied to raw scores of each person in each group.

Figure D.1 in Appendix D depicts how such linear functions discriminate two groups. After weights $a_1, a_2, \ldots, a_k$ are applied to each persons raw scores, the new scores can be projected on a line Y. The scores for each person on line Y can be located as frequency distributions. The location of scores on Y serves to condense the discriminatory information on the variables entered.

The program performs the multiple discriminant analysis in a stepwise manner, entering or removing a variable from the set of discriminating variables according to specific criteria (Dixon, 1968, p. 214a). This provides selection of a variable, its optimal weighting, and a

constant which comprise the discriminant function or predictive equations. The fundamental criterion for entry of a variable into the equations is determined by the amount of variance explained by it. This is a special application of multiple regression analysis whereby optimal weights are obtained which maximize the F ratio of the

$$\frac{\text{variance between means on Y}}{\text{variance within groups on Y}} \, .$$

Details of this process are discussed by Nunnally (1967, p. 392).

The computer program provides a classification matrix at each step indicating the correct "hits" as determined by the correspondence between the discrimination of the equation and the known criterion group membership. Finally, it establishes the probability of each person coming from his group on the basis of his profile scores.

In order to provide a confirmation of the significant variables differentiating the employed and unemployed groups on the basis of their test data, a second analysis of the Standardization data was made. This was accomplished with a different mathematical model, Stepwise Regression Analysis, BMD2R, computer program (Dixon, 1968). This alternate statistical procedure identified the same discriminating variables with identical F values and followed an identical stepwise pattern in explaining the variance.

APPLICATION OF FINDINGS TO THE CROSS-VALIDATION SAMPLE

With predictive models the initial findings should be tested with

additional, independent samples to demonstrate potential for prediction

beyond the original sample.

To accomplish this, a follow-up of the Cross-Validation subjects

relative to their current vocational-educational status was made in

June, 1970. Their CPI protocols, which recorded their responses while

involved in a previous vocational evaluation program, were classified

according to their current vocational status. Each CPI answer sheet

was re-scored with the Employment Key to obtain each subject's score on

this experimental scale. This 19th variable was keypunched on data

cards along with the values for the subjects' 18 standardized scale

values. This provided data parallel to that gathered from the Stan-

dardization subjects.

The Stepwise Discriminant Analysis program provides a ready oppor-

tunity for admitting test data of new subjects for predictive classifi-

cation according to the discriminant functions established on the ini-

tial group of subjects (Dixon, 1968, p. 214e). This facilitates an

evaluation of the predictive efficacy of the discriminant functions in

a Cross-Validation technique. It should be noted that if computer

facilities are unavailable, the predictive classifications can be per-

formed through manual computations by inserting the raw scale scores of

new subjects into the discriminant function equations established on

the original data.

The results obtained from these procedures are presented in the

following chapter.

CHAPTER V

RESULTS

Results will be reported in two major sections, the Standardization sample and the Cross-Validation sample.

The Standardization sample includes a report of the individual scale differences and a generalized test of significance between the employed and unemployed groups. Secondly, it includes an Employment Key empirically developed by an item analysis. Finally, it reports a stepwise discriminant function analysis for the purpose of developing a formula for prediction.

The Cross-Validation sample section presents the classificatory power or predictive results obtained when the discriminant functions, established on the Standardization sample, were applied to the CPI scores of a separate group of subjects who were administered the CPI previously and whose current employment status was established on follow-up.

Standardization Sample

EVALUATION

Table 5.1 compares the employed and unemployed groups on the 18 standardized scales. Significant t ratios at the .01 level of confidence were found on nine scales: Dominance, Capacity for status, Social presence, Well-being, Tolerance, Communality, Achievement via

TABLE 5.1

COMPARISON OF EMPLOYED AND UNEMPLOYED ON THE SCALES OF THE CPI

CPI Scales	Employed N = 51		Unemployed N = 50		Diff M	t Ratio
	M	SD	M	SD		
Dominance	29.4	6.0	25.7	6.4	3.7	2.90*
Capacity for Status	18.8	4.3	15.6	4.6	3.2	3.60*
Sociability	24.8	5.1	22.8	5.5	2.0	1.86*
Social Presence	33.5	6.0	30.2	5.9	3.3	2.74*
Self-acceptance	20.5	3.8	18.8	4.1	1.7	2.17
Sense of Well Being	36.4	4.9	33.4	6.0	3.4	3.03*
Responsibility	30.4	4.9	28.1	5.0	2.3	2.31
Socialization	35.9	6.2	33.4	5.6	2.5	2.11
Self-control	30.6	6.5	28.3	7.1	2.3	1.63
Tolerance	19.6	6.0	16.4	5.5	3.2	2.78*
Good Impression	20.6	5.3	19.2	5.8	1.4	1.28
Communality	26.6	1.6	25.0	2.7	1.6	3.57*
Achievement via Conformance	27.3	4.8	24.5	4.6	2.8	3.02*
Achievement via Independence	16.6	4.1	13.3	4.8	3.3	3.74*
Intellectual Efficiency	35.7	6.0	32.5	3.6	3.2	2.56
Psychological Mindedness	11.0	2.9	9.2	2.4	1.8	3.26*
Flexibility	6.5	3.7	5.3	3.6	1.2	1.71
Femininity	18.2	4.0	18.4	3.7	-0.2	-0.34

*P < .01

conformance, Achievement via independence, and Psychological-mindedness.

Figure 5.1 reports these data in graphic form.

The Mahalanobis D^2 statistic was used to test the overall distance or generalized difference between the two groups dichotomized on employment versus unemployment. The Discriminant Analysis—Two Groups (BMD04M) program established a D^2 value of 6.6403. To test the hypothesis specifying no difference in mean values between groups on the 18

PROFILE SHEET FOR THE *California Psychological Inventory:* **MALE**

Notes:

Employed Group
(N=51)

Unemployed Group
(N=50)

Standard Scores

MALE NORMS

Do Cs Sy Sp Sa Wb Re So Sc To Gi Cm Ac Ai Ie Py Fx Fe

*t test significant at .01 level
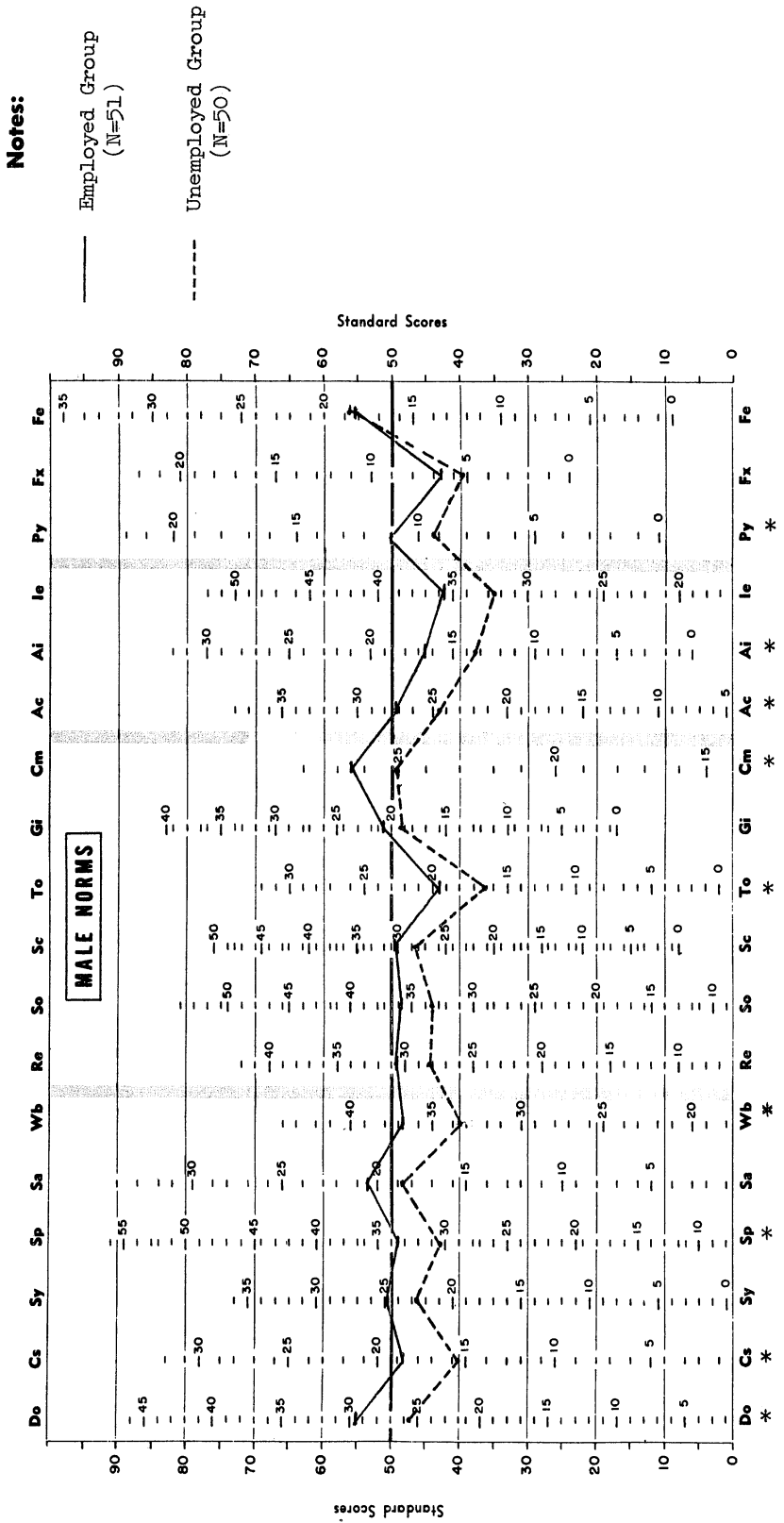
Figure 5.1. Comparison of employed and unemployed Standardization subjects on the CPI.

CPI scale scores, this value was converted to an $\underline{F}$ value of 7.219

according to the formula (Rao, p. 247)

$$\frac{N_1 N_2 (N_1 + N_2 - p-1)}{P(N_1 + N_2)(N_1 + N_2 - 2)} D^2.$$

With 18 and 82 degrees of freedom, according to the formula p and $(N_1 +$

N_2 - 1-p), this value is sufficient to reject the null hypothesis of no

difference in mean values for the two groups at the .001 level of con-

fidence. The formula for estimating the Mahalanobis distance between

two populations may be found in Table D.1 of Appendix D.

The importance of this statistic lies in its ability to reduce a

number of variables to a single measure of discrimination. The high

degree of confidence attained by this statistic lends support to the

contention that visually impaired persons who differ in respect to em-

ployment versus unemployment also tend to describe themselves differ-

ently on the CPI.

Table D.2 furnishes a within groups correlation matrix to provide

comparisons of the scale values of the Standardization subjects.

EMPLOYMENT KEY

An item analysis was performed on each of the 480 CPI statements

of the 101 Standardization subjects. This provided a measure of asso-

ciation between the employed versus the unemployed groups and the re-

spective frequencies of their directions of response to each item, true

or false. Twenty-one items reached significance at the .01 level of

confidence. Table D.3 in Appendix D furnishes a listing of these items, corresponding chi square values, direction of scoring, and the location of these items in the standardized CPI scales. Another 51 items reached a significance at the .05 level of significance but were not considered further in the analysis of the data.

The 21 items of .01 level of confidence were next combined into a separate scale designated as the Employment Key (Ek). Each CPI answer sheet was rescored with this key. A preliminary indication of the discriminating power of this scale between the employed and unemployed groups is suggested by the t ratio of 9.21 between mean differences which is significant at the .001 level of confidence. Table 5.2 provides a comparison of the distributions of raw scores obtained by the employed and unemployed groups on the Employment key. A suggested cutting score for the Employment key scale and its discriminatory power as an independent scale will be presented later in this chapter in relation to both Standardization and Cross-Validation subjects.

STEPWISE DISCRIMINANT ANALYSIS

This analysis of the Standardization data was made with the 19 predictor variables, the 18 standardized CPI scales and the Employment Key scale scores. The corresponding F values with 1 and 99 degrees of freedom revealed significant differences between the criterion groups on 14 scales. The Employment key, Achievement via independence, Capacity for status, and Communality scales differentiated the employed

TABLE 5.2

DISTRIBUTION OF SCORES ON EMPLOYMENT KEY SCALE
FOR EMPLOYED AND UNEMPLOYED GROUPS IN THE
STANDARDIZATION SAMPLE

t Score	Employed	Unemployed
21		
20	1	
19	1	
18	5	
17	9	1
16	8	
15	4	2
14	9	1
13	3	8
12	6	2
11	2	5
10	2	4
9		4
8	1	7
7		4
6		5
5		2
4		1
3		2
2		2
1		
N	51	50
M	14.84	9.16
SD	2.56	3.53

$M_1 - M_2 = 5.68$; $t = 9.21$, $P < .001$

from the unemployed groups at the .001 level of confidence. The Psy-
chological-mindedness, Well-being, Achievement via conformity, Domi-
nance, Tolerance, and Social presence scales differentiated the em-
ployed groups with .01 level of significance. The Intellectual effi-
ciency, Responsibility, Self-acceptance, and Socialization scales

reached significance at the .05 level of significance. These results

are presented in Table 5.3.

TABLE 5.3

F VALUES FOR EACH SCALE PRIOR TO ENTRY
INTO THE DISCRIMINANT FUNCTIONS

CPI Scales	F Value
Dominance	8.428**
Capacity for Status	12.951***
Sociability	3.484
Social Presence	7.503**
Self-acceptance	4.742*
Well Being	9.205*
Responsibility	5.358*
Socialization	4.457*
Self-control	2.661
Tolerance	7.768**
Good Impression	1.651
Communality	12.731***
Achievement via Conformance	9.167**
Achievement via Independence	13.980***
Intellectual Efficiency	6.587*
Psychological-mindedness	10.675**
Flexibility	2.852
Femininity	0.116
Employment Key	84.139***

N = 101
* < .05
** < .01
*** < .001

Discriminant Functions

In order to establish the most efficient pattern of scales for

differentiating the employed from the unemployed, the Stepwise Discrim-

inant Analysis program repeated numerous analyses of the data in a

stepwise manner. At each step that variable was entered into the equation which had the largest F value, gave the greatest decrease in the ratio of within to total generalized variances, and had the highest multiple correlation with the groups when partialed on the previously entered variables. This method identified at each step which variable accounted for the most variance in combination with the previously entered variables, and evaluated the capacity of the discriminant function at each step to classify subjects according to their dichotomous groups of origin.

Table 5.4 provides a comparison of the F values established during the first five steps of the stepwise discriminant analysis. After that point the rapid reduction of F values of those variables not yet entered into the equation accounted for little, if any, of the unexplained variance. Likewise, additional steps increase the possibility of chance covariance. It must be stressed that the maximum efficiency in classifying subjects was found at the second step with the entrance to the equation of the Employment Key and Tolerance scales. However, because of sample limitations and the exploratory nature of this study, consideration will also be given to the five-variable equations.

Table 5.4 furnishes a comparison of the initial F values prior to the stepwise computations of the discriminant functions. At each step the asterisk indicates the point of entry of that variable into the equations which accounts for the most variance when partialed on the variable(s) already entered into the equation. After each step the

TABLE 5.4

STEPWISE ENTRY OF VARIABLES
WITH CORRESPONDING F VALUES AT EACH STEP

Variable Entered	Initial F	Step 1 Ek	Step 2 To	Step 3 So	Step 4 Ie	Step 5 Ac
Do	8.428	0.929	1.137	0.917	0.168	1.406
Cs	12.951	3.964	0.288	0.195	0.046	0.028
Sy	3.484	3.277	1.670	1.276	0.148	1.031
Sp	7.503	8.547	3.930	2.076	0.832	0.708
Sa	4.742	1.060	1.005	0.559	0.031	0.492
Wb	9.205	3.869	0.076	1.397	0.924	1.618
Re	5.358	4.594	0.015	1.006	0.451	1.438
So	4.457	0.539	4.434	*4.434	---	---
Sc	2.661	0.642	1.261	0.036	0.000	0.075
To	7.768	23.970	*23.970	---	---	---
Gi	1.651	0.646	0.259	0.011	0.013	0.417
Cm	12.731	1.075	0.114	0.007	0.209	0.053
Ac	9.167	0.006	2.024	0.607	2.641	*2.641
Ai	13.980	8.666	0.188	0.008	0.026	0.022
Ie	6.587	14.559	2.080	2.176	*2.176	---
Py	10.675	1.977	0.020	0.003	0.092	0.000
Fx	2.852	2.795	1.115	0.110	0.285	0.075
Fe	0.116	2.617	1.889	0.696	0.086	0.063
Ek	84.139	*84.139	---	---	---	---

decrease of F values can be noted. Table 5.5 should be consulted in conjunction with Table 5.4. Table 5.5 specifies the discriminant functions and constants computed at each step. These values provide variable weightings in equation for use with each subject's raw scores. These values may be thought of as regression weights. This model provides discriminant functions for each dichotomous group at each step. A subject's group classification is determined by whichever equation in combination with his raw scores produces the larger value. Gough (1962, p. 538) describes the discriminant function analysis as an

TABLE 5.5

DISCRIMINANT FUNCTIONS AT EACH STEP
VARIABLE WEIGHTS, AND CONSTANTS

Variable(s) Entered	Functions	
	Employed Group	Unemployed Group
Step 1		
Employment Key	1.531	0.945
Constant	-11.366	- 4.328
Step 2		
Tolerance	- 0.116	0.243
Employment Key	1.698	0.596
Constant	-11.459	- 4.734
Step 3		
Socialization	1.050	0.936
Tolerance	- 0.636	- 0.219
Employment Key	2.197	1.040
Constant	-28.914	-18.599
Step 5		
Intellectual Efficiency	0.935	1.051
Socialization	1.027	0.910
Tolerance	- 1.197	0.849
Employment Key	1.685	0.465
Constant	-35.903	-27.425
Step 5		
Achievement via Conformance	0.436	0.292
Socialization	0.928	0.844
Tolerance	- 1.184	- 0.840
Intellectual Efficiency	0.730	0.913
Employment Key	1.762	0.516
Constant	-37.129	-27.974

alternative to the multiple-regression equation, so developed for use

when the prediction problem is to place a subject in one of the two or

more discrete or unordered classes.

From data reported in Table 5.5 the following pairs of equations

may be written for use with raw CPI scale scores.

Two-variable equations:

$$\text{Employed} = -11.459 +1.698\text{Ek} -.116\text{To}$$

$$\text{Unemployed} = - 4.734 + .596\text{Ek} +.243\text{To}$$

Five-variable equations:

$$\text{Employed} = -37.129 +1.762\text{Ek} -1.184\text{To} +.928\text{So}$$

$$+.730\text{Ie} +.436\text{Ac}$$

$$\text{Unemployed} = -27.974 +.516\text{Ek} -.840\text{To} +.844\text{So}$$

$$+.913\text{Ie} +.292\text{Ac}$$

The discriminant functions generated at the second step provided a two-variable equation which classified correctly 94% of the employed subjects. This represents a total of 48 "hits" out of a possible 51. The equations were slightly less efficient with the unemployed. Eighty-two percent were correctly classified from this group with 41 "hits" from a possible 50. Table 5.6 presents the efficacy of the discriminant functions with the two-variable equation.

TABLE 5.6

CORRECT CLASSIFICATION OF SUBJECTS BY THE DISCRIMINANT
FUNCTIONS GENERATED WITH THE TWO-VARIABLE EQUATION

Actual Employment Status	Employment Classification			
	Employed		Unemployed	
	N	%	N	%
Employed	48	94	3	6
Unemployed	9	18	41	82

Use of the five-variable equations produced identical discrimi-
nating power (94%) with the employed. With the unemployed the efficacy
decreased slightly with forty "hits" observed for a 2% loss. However,
permitting the program to include five variables in the equations ex-
plains further variance between the employed and unemployed groups, and
simultaneously identifies additional personality traits which distin-
guish the two groups.

Cross-Validation Sample

A Cross-Validation technique is useful to determine whether the
predictive findings of an empirical study are useful beyond the sub-
jects on whom such findings were initially developed. To provide such
a test in this model, the earlier CPI test results and current voca-
tional status of an independent group of blind subjects were used.

Specifically, this Cross-Validation procedure is addressed to the
question of whether the Employment Key scales and the discriminant
functions presently developed for use with the CPI could have predicted
the current employment status of subjects who were administered the CPI
previously during their vocational evaluation program.

In addition, the use of Cross-Validation subjects underscores an
important aspect to this predictive model in that their test scores
were obtained while they were unemployed and receiving concentrated
rehabilitation services. Consequently, this precludes the possibility

of their test scores being influenced by employment experiences which might contribute to test score differences between the employed and unemployed.

A comparison of means and standard deviations of the Cross-Validation subjects on the 18 CPI scales and the experimental Employment Key scale may be found in Tables D.4 and D.5 in Appendix D. Figure D.2 provides a graphic comparison between the scale means of the working and nonworking subjects in the Cross-Validation sample.

Table 5.7 presents the distribution of scores on the Employment key scale for the Cross-Validation subjects. The Employment Key discriminated between the employed and unemployed groups at the .05 level of confidence. It should be pointed out that the mean value of the college student group on the Employment Key closely resembles those obtained by the employed groups of the Standardization and Cross-Validation samples. This suggests that the college students tend to describe themselves in a manner similar to that of the employed subjects in this study. Table 5.8 presents the predictive efficiency of the Employment Key when it is used as an independent scale. A cutting point at 12 is indicated on the table. The accuracy of its discriminating power to identify the employed and unemployed in the Standardization and Cross-Validation samples is presented.

The two-variable equations predicted employment among the working Cross-Validation subjects with 82% accuracy by identifying nine of the eleven working subjects. The effectiveness of these equations in

TABLE 5.7

DISTRIBUTION OF SCORES ON THE EMPLOYMENT KEY SCALE
FOR THE CROSS-VALIDATION SUBJECTS

Score	Employed	Unemployed	Employed, Extensive Efforts	College Students
21				
20				
19	1			1
18				1
17	1			1
16	1	1		2
15	1	2		2
14	1			4
13	2			1
12	2	1	1	1
11		2		2
10		4		
9	1	3		1
8				1
7	1	2		
6			1	
5				
4				
3			1	
2				
1				
N	11	15	3	17
M	13.363	10.733	7.0	13.294

Employed vs. Unemployed: $M_1 - M_2 = 2.630$; $t = 2.172$, $P < .05$

predicting unemployment among the nonworking subjects was 80% as twelve

of the fifteen unemployed were correctly identified. Table 5.9 pre-

sents the predictive accuracy with the two-variable equations. As

found with the Standardization subjects the increase of variable en-

tries to five did not increase the predictive efficiency over the two

TABLE 5.8

THE DISCRIMINATING POWER OF THE EMPLOYMENT KEY SCALE
WITH A SUGGESTED CUTTING SCORE AT 12

Score	Employed		Unemployed	
	Standardiza- tion Subjects	Cross-Valida- tion Subjects	Standardiza- tion Subjects	Cross-Valida- tion Subjects
21				
20	1			
19	1	1		
18	5	1		
17	9	1	1	
16	8	1		1
15	4	1	2	2
14	9	2	1	
13	3	2	8	
12	6		2	1
11	2		5	2
10	2		4	4
9	1	1	4	3
8			7	
7		1	4	2
6			5	
5			2	
4			1	
3			2	
2			2	
1				
N	51	11	50	15
Correct Classif- ication:	46 (90%)	9 (82%)	36 (72%)	11 (73%)

variable equation. Its predictions with the nonworking group produced

identical efficiency but was slightly less efficient with the working

group, classifying eight of eleven subjects correctly.

The additional criterion group, which was identified as comprising

the three subjects who were employed but only "after extensive

TABLE 5.9

PREDICTIVE ACCURACY OF THE TWO-VARIABLE
EQUATION WITH THE CROSS-VALIDATION SUBJECTS

Actual Employment Status	Predicted Employment Classification			
	Employed		Unemployed	
	N	%	N	%
Employed	9	82	3	20
Unemployed	2	18	12	80

counseling and unique interagency cooperation," was analyzed in the following manner. One subject was classified correctly as employed, while the remaining two were incorrectly classified as unemployed. This kind of error in prediction suggests both the importance of considering all other pertinent information about the client as well as the value of well planned case services, despite a poor prognosis based solely on test scores.

For exploratory purposes the CPI test protocols of those 17 Cross-Validation subjects presently attending college were analyzed with the two-variable discriminant functions. Twelve of the 17 subjects were classified statistically as "employed" which suggests that their Employment Key and Tolerance scale responses appear to resemble those of the employed Standardization group. Figure D.3 in Appendix D presents the CPI scale means for the college students, including the Employment Key. It should be observed that when classification of college students was made only with the Employment Key, one additional student was classified as "employed."

Tables D.6 and D.7 in Appendix D present summary statistics for each Cross-Validation subject. These tables list each subject according to his a priori group membership, i.e., actually working or non-working. It furnishes the predictive classification according to the discriminant functions, the squared Mahalanobis distance from the predicted group, and, in parentheses, the associated probability that the observation came from that group.

Figure D.4 presents the grand means for all groups on the CPI scales, including the Employment Key.

In summary, the evidence of significant scale differences and the generalized distance between the two groups is sufficient to reject the null hypothesis that the employed and unemployed subjects of the Standardization sample would be undifferentiated on the basis of their CPI scale scores. Further, the individual and collective significance of the Employment Key scale items is sufficient to reject the second null hypothesis that the employed and unemployed subjects of the Standardization sample would undifferentiated by their respective of item responses.

CHAPTER VI

DISCUSSION

The findings of this study, while preliminary, suggest that the CPI shows promise as a standardized personality inventory as one source of information for evaluating the vocational readiness of visually impaired male adults. The generalized differences between the employed and unemployed of both samples reflect their dissimilarity on personality traits as measured by the CPI.

The employed subjects of this study scored systematically higher than the unemployed on all CPI scales except the Femininity scale. This finding suggests that this scale may measure aspects of behavior which may not be related to personality traits associated with employability.

The nine CPI scales which significantly differentiated the employed from the unemployed suggest that the CPI may be identifying important differences in personality traits.

Certain items are particularly strong discriminators between the employed and unemployed groups. When these items are combined into a single scale their collective differentiating power is surprisingly strong, both as a scale accounting for a disproportionately large amount of the variance in relation to the standardized CPI scales, and as an independent screening measure with a designated cutoff point. Similar uses of cutoff points with individual CPI scales have been

effectively used with discrete populations. Examples are those

dealing with the severity of asocialization as measured by the Social-

ization scale (Gough, 1965b) and the presence of anxiety (Levanthal,

1966; 1968).

The identification of the Employment Key items and discriminant

functions in this model provide a convenient method for sharing these

findings with other investigators who may want to study their validity

and usefulness in other evaluation-type settings. The application of

the Employment Key items and discriminant functions to additional CPI

protocols should provide opportunities for making individual pre-

dictions even when computer facilities are not readily available.

An interesting aspect to the identification of the optimally

discriminating variables, which distinguish the employed from the

unemployed, is the opportunity to advance personality trait sketches

which may characterize the dichotomous groups. This seems warranted

because the CPI scales have been intensively researched and adjectival

descriptions provided for each scale and groups of scales (Gough,

1957). The interpretation of profiles on the strength of individual

scales, and diagnostic implications on the basis of patterns and com-

binations of scales in interaction are discussed by Heilbrun, Daniel,

Goodstein, Stephenson, and Crites (1962).

Apart from the discriminatory power of the Employment Key and

its usefulness as an independent scale for prediction, some behavioral

traits may be provisionally suggested by examination of the scale

items. (See Employment Key items, Table D.3 in Appendix D.) The

following description must be considered speculative until additional

research can relate the scale to independent trait criteria. Tenta-

tively, the employed seem to have stronger feelings of selfworth,

confidence and adequacy (items 154, 311, 338, and 452) as well as an

absence of excessive fear (items 79 and 452). These positive self-

esteem characteristics of the employed are accompanied by a posture

of flexibility and capacity for adaptive behavior in thinking and so-

cial attitudes (items 47, 237, and 377) along with an open-minded,

nonjudgmental approach to another's point of view (items 41 and 128).

The employed further seem to possess a certain capacity for decision

making (items 13 and 383) which may underlie a capacity for commit-

ment to goal-directed activity.

The association of higher self-esteem characteristics among the

employed blind is also reported by Scholl, Bauman, and Crissey (1969)

who found work-related criteria to be associated with more favorable

self-evaluations. Schwartz, Dennerll, and Lin (1968) found employment

among epileptics associated with CPI scales which are felt to reflect

social poise and self-assurance. Bauman (1954) reports that the

subjects of her employed and generally well adjusted group were better

integrated into their social milieu.

The Tolerance scale was selected by the stepwise analysis as the

most discriminating variable after the Employment Key. This scale

provides additional opportunity for sketching provisional personality

differences between the employed and unemployed in this study.

Gough (1968c) reports that the Tolerance scale was designed to be a

subtle or indirect measure of the authoritarian personality syndrome

as assessed by the California F scale (Adorno, Frenkel-Brunswik,

Levinson, and Sanford, 1950). The Tolerance scale items were selected

on the basis of their correlation with this scale and the California

E (ethnocentrism) scale.

Initially it should be noted that the subjects of this study

scored consistently below the mean for the national reference group

(Gough, 1957). This may suggest that the visually impaired of this

study tend to be slightly more rigid, less permissive, and less accept-

ing of others and their personal beliefs than people in general.

Since the unemployed in this study scored systematically lower on the

Tolerance scale than did the employed, there appears to be evidence

which suggests that the employed persons of this study tend to be more

permissive, accepting and open-minded, and less authoritarian and

self-centered than their unemployed counterparts.

When the computer program continued to a five-step analysis of

the data, the Socialization, Intellectual efficiency, and Achievement

via conformance variables were joined to the variables of the two-step

equations. The predictive efficiency was not improved with the entry

of the additional variables and one unemployed subject in the Stand-

ardization group and one working subject in the Cross-Validation group

were misclassified. This slight decrease in classification accuracy

may be due to chance covariance. The advantage in identifying addi-

tional significant variables provides a more complete accounting for

the variance between the groups and offers additional personality

trait information which may distinguish the employed from the unem-

ployed on behavioral characteristics.

The entry of the Socialization scale into the set of discrimi-

nating variables suggests that the employed persons resemble those

who tend toward a greater degree of social maturity, are more able

to accept rules and authority, and are not given to rash or thoughtless

behavior. The emergence of the Achievement via conformance scale is

noteworthy in that it stresses the cooperative aspects of concern

for others while striving for personal achievement. Persons scoring

high on this scale are felt to work well in situations having clear

cut rules and regulations. The Intellectual efficiency scale, which

is selected as the next most discriminating variable, is regarded as

a measure of personal effectiveness, essentially intellectual, which

facilitates task accomplishment in an intelligent, resourceful manner.

In summary, it seems that the employed subjects in this research

possess more of the above characteristics, and to a greater degree,

than the unemployed subjects.

The above discussion attempts to deal with those personality

characteristics presumed to differentiate the employed from the un-

employed in this study. It is important to note that no attempt was

made to contrast these criterion groups on a well adjusted-poorly

adjusted continuum. In her study Bauman (1954) distinguishes three

groups: those employed and generally well adjusted; those not success-

full in employment but generally well adjusted; and those not success-

ful in employment and generally poorly adjusted. However, inspection

of the CPI protocols and interview impressions gained during this

study suggest that employability may not necessarily be synonomous

with good adjustment. This may suggest that Bauman's first group

should be subdivided to include those competitively employed but not

"generally well adjusted." Such a category would seem to be apropos

to the relationship between personality functioning and employment

in the general population. To postulate such a category might

contribute to a more effective evaluation of both personality data and

interview material in vocational assessment and planning with the

blind. It is suggested that future research be addressed to the

question of whether employability among the blind is related to some

very discrete personality factors which may be quite separate from

those felt to reflect "good adjustment" among the blind.

The practical implications of these findings should be inter-

preted with caution and understood in the context of this research

and its inherent limitations. The use of these findings with clients

should be made with the circumspection required for the use of all

test results. It must be noted that not every subject in this study

was correctly classified according to his test results. Furthermore,

there are other considerations which may bear upon a blind person

obtaining employment. These are independent of his personal func-

tioning, such as fluctuating opportunities in the job market, local

employer bias, variable agency policies, the availability of training

resources, and the deviating policies of early industrial retirement

and the structure of Social Security Disability which may make job

retraining and low level employment less than feasible.

Another consideration affecting employability may be the degree

of vision possessed by an individual. Partial vision may increase

one's capacity to perform adequately on a particular job. This point

may find support in the fact that the employed of both samples in this

study reported themselves as having usable vision.

The findings of this study present interesting research oppor-

tunities for those charged with the responsibility of developing man-

power among the visually impaired. The current findings suggest that

personality traits are important variables bearing on employability

among the blind. Further, these results indicate that the CPI shows

promise for measuring those traits related to the dimension of em-

ployability. The lack of systematic research with personality measures

for the blind (Wachs, 1966), and the apparent absence of studies in-

vestigating the associations between personality traits and performance

criteria may be contributing by default to underemployment and un-

employment among the blind.

Because the CPI was developed as a general-purpose inventory for

the prediction of a variety of personality criteria (Hase and Gold-
berg, 1967), its use provides information about an individual on a
number of behavioral dimensions. Because of its diversified research
applications, some of which were discussed above, it seems to have
particular relevance to such goal directed behavior as the prediction
of success in job training and in maintaining employment. Workers
who are involved with the determination of job readiness and employ-
ment potential in an evaluation-oriented setting do not simply "sort
out" the most promising clients for job placement. For many subjects
employability lies far beyond the evaluation procedure. Responsible
manpower development calls for identification of the individual's
needs for personal adjustment training, his current capacity to accept
work responsibilities, or his readiness for vocational training. The
CPI should be considered a useful instrument for plumbing out infor-
mation relative to these questions as well as for providing diagnostic
implications for on-going personal counseling when indicated.

A precautionary correllary should follow a discussion of a
predictive model such as this. Granting for the moment the continued
validity of these findings, two outcomes might occur. When a subject
responds very favorably to the CPI scales and items, counseling and
agency personnel could relax efforts, assuming in error that such a
person will achieve vocational success with minimal assistance. At
the other extreme a client may depict himself very poorly on the CPI,
thereby stimulating the destructive assumption that whatever counseling

and agency assistance is offered will be fruitless. The possibility

of these dangers demonstrate the importance of evaluating all other

information such as is available by interview, case history, and other

test data (Elonen and Cain, 1964). Excessive reliance upon any one

source of data is precarious and potentially detrimental to the client.

A case in point is the reminder of the erroneous classification by

this model of two of three employed Cross-Validation subjects who were

designated by Rehabilitation Institute personnel as unique in that

they were employed but only through extensive counseling and inter-

agency cooperation. If these three subjects maintain successful em-

ployment, their success will underscore the inherent weakness of re-

lying solely on test results. The example of these three employed

subjects bears on another point in that their separate classification

represents the employment of the "unemployable" and illustrates some-

thing of the distance which can be bridged by concentrated, in-depth

services in manpower development when prognostic indications are

far from favorable.

In general the findings of this research suggest that the CPI

can contribute meaningful data to that body of psychological, social,

vocational, and educational information required for the thorough

assessment of vocational potential in manpower programs with the

visually impaired. In particular, the findings of this study suggest

that workers with the blind should strive for even better placement

of clients with "higher employability scores" than they would have in

the past without such supportive test data.   Workers with the blind

should also designate those with "lower employability scores" as

candidates for extensive interagency cooperation and intensive voca-

tional counseling.

Limitations Of The Study

The findings presented in this research should be considered in

relation to certain limitations.   Initially, the small sample sizes

in both the Standardization and Cross-Validation phases emphasize

the provisional value of the Employment Key and discriminant functions.

In addition, the subjects were limited to one geographical area.   Their

identification and cooperation with testing were of such complications

that a randomized sampling procedure was impossible.   Consequently,

there are unanswered questions relative to possible differences be-

tween those who were identified and who did in fact cooperate as op-

posed to those who may not have been identified or who did not coop-

erate.

While a limitation may lie in the arbitrary criteria used for

the admission of employed and unemployed subjects to the Standardi-

zation sample, this approach did seem to offer a parsimonious method

for determining whether the employed blind differ from the unemployed

on personality trait characteristics.

Perhaps the most conspicuous bias occurred when unanticipated

difficulty was encountered in locating unemployed persons for the

Standardization sample. This limitation appears to have implications

for further research of this kind as well as for private agency

resources who may want to offer their services by personal contact to

the chronically unemployed.

The approach of this study suggests there may be a "lost" blind

population. This is consistent with Scott's (1969) criticism of pro-

grams of agencies for the blind. The State Services for the Blind

reported that their contact letters to locate former, unemployed

clients, were returned with postal notification of having no forward-

ing address. When this investigator followed up a list of names from

a private agency, phone contacts indicated that the majority of

subjects had moved. This suggests the presence of a highly transient

population among the blind. In the absence of a central registry of

blind persons and the current legal restrictions imposed upon the

identification of the visually impaired who are receiving public

assistance, one concludes that there is an unemployed blind population

which is beyond the reach of certain private agencies and research

efforts.

This inability to locate the unemployed subjects for the Standard-

ization group was circumvented in part by the assistance of numerous

blind subjects who enthusiastically volunteered their assistance to

identify and/or contact potential subjects in the community. Despite

this invaluable assistance, it is presumed that "isolates," the

transient, chronically unemployed who do not identify with organizations for the blind or with other blind subjects are in fact not represented in this study. Such persons are deprived of employment counseling services unless they themselves request help from an agency of their choice.

The failure to identify relatively young, chronically unemployed males necessitated the inclusion of a number of older males who seemed to be prematurely retired and supported by varying forms of disability insurance benefits, including Social Security Disability. An examination of the computer print-out indicates that these early retirees contributed notably to the inaccuracy of the classification of the unemployed Standardization group, 41 of 50 correct. In contrast the model was able to classify correctly 48 of 51 employed Standardization subjects. This suggests that had the test scores of these "early retirees" been omitted, a stronger test score dichotomy between the two groups may have been obtained.

This bias in sample selection is to some extent counterbalanced by the use of the Cross-Validation subjects.

Implications For Further Research

The findings of this study suggest further research both in relation to additional analyses of the data collected in this study as well as for additional research designs employing the CPI. The

following arise specifically from this study:

1. A continuing validation of these findings should be made through periodic follow-up procedures of all blind clients who receive the CPI at the Rehabilitation Institute, Detroit, Michigan.

2. Additional analyses of the current data should be made to determine whether such variables as the degree of vision, age of onset, and the type of onset of visual impairment are associated with certain CPI scales or the employed versus unemployed dichotomy.

3. The current data should be analyzed to determine whether any CPI variables are associated with certain occupations represented in this study.

4. A visual scanning of the CPI items suggests that six items may have slightly different implications for visually impaired persons. These statements should be examined in an item analysis as well as considered in relation to their parent scales to determine whether any should be eliminated from presentation to the visually impaired.

The following are suggestions for further research:

1. Impressions gained from this study suggest that the CPI is a useful instrument for developing the manpower potential of the visually impaired. It appears to be a versatile, widely researched, and conveniently administered instrument. In view of the dearth of systematic personality assessment with the blind, the CPI could be employed to study personality characteristics of the visually impaired and other handicapped groups.

2. The CPI should also be considered for the prediction of performance criteria, such as level of employment or academic achievement, among the visually impaired and other handicapped groups.

3. The Employment Key scale and discriminant functions developed in this study can be readily used on an individual basis whenever the CPI is part of a psychological evaluation. The confidence with which predictions may be made with these techniques will depend upon the results of such efforts in various settings. Further use of the Employment Key with subjects in other settings may increase confidence in using it.

4. Since the CPI and the Employment Key items are not uniquely related to the visually impaired, but presumably applicable to some aspect of the employment-unemployment dimension, the application of these findings should be considered for use with other handicapped populations. For example, a request has already been made for the use of the Employment Key scale by another investigator in studies of employability of subjects with seizures.

CHAPTER VII

SUMMARY AND CONCLUSIONS

Unemployment and underemployment among the blind have been attributed to a variety of factors in addition to the visual impairment itself. This study is concerned with relationships between the personality characteristics of the visually impaired and their suitability for employment. Personality measurement with the blind has not been extensively explored nor systematically related to prediction of performance criteria. The California Psychological Inventory was chosen to determine whether a standardized "objective" personality measure could identify differences between groups of employed and unemployed blind, and, if so, whether such differences could be used to predict employability among the blind.

This study consisted of two phases, Standardization and Cross-validation. For the Standardization phase 51 visually impaired males were identified who were employed full time for at least 2.8 years in occupations not requiring a college degree. Visually impaired persons whose employment was dependent on a college degree were excluded in order to focus on groups with relatively homogeneous educational backgrounds. The unemployed group consisted of 50 visually impaired males who had not worked for at least 2.7 years. All subjects resided in Southeastern Michigan. They were located through

agencies serving the blind and by the subjects themselves.

The CPI was administered to the Standardization subjects by means of a tape recorded presentation of the items for card sort according to their agreement or nonagreement with each item. An Interview instrument was developed to obtain demographic data to compare the employed and unemployed on selected characteristics. This instrument was administered orally to each subject.

An initial analysis of CPI data indicated that the unemployed scored significantly lower than the employed on nine scales. When the scale score differences were analyzed by a Discriminant Analysis for two groups, a Mahalanobis D^2 or generalized difference between the groups was significant at the .001 level of confidence suggesting the dissimilarity of personality traits between the employed and unemployed as measured by the CPI.

An item analysis indicated that 21 CPI statements discriminated between the employed and unemployed groups at the .01 level of significance. These items were combined into a scale and designated the Employment Key. Mean differences between the employed and unemployed groups on the Employment Key scale differed with .001 significance. With a suggested cutting score at 12, the Employment Key correctly identified 90% of the employed and 72% of the unemployed Standardization subjects.

A Stepwise Discriminant Analysis was selected for the purpose of identifying an optimal pattern of predictor variables for

discriminating the employed from the unemployed. Two and five

variable equations were developed. The most efficient equations used

the Employment Key and Tolerance scales with the following coeffi-

cients: Employed = -11.459 +1.698Ek -.116To; Unemployed = -4.734

+.596Ek +.243To. These discriminant functions are for use with raw

scores; whichever equation produces the larger value determines the

subject's predicted classification, employed or unemployed. These

equations classified correctly 94% of the employed and 82% of the

unemployed in the Standardization sample.

The Cross-validation phase consisted of efforts to test the

usefulness of these findings beyond the original sample. Subjects

for the Cross-Validation technique consisted of those visually

impaired males who previously were administered the CPI as part of

their psychological evaluation while receiving Comprehensive Services

for the Blind at the Rehabilitation Institute, Detroit, Michigan.

Those with additional physical impairments or emotional difficulties

were eliminated. Follow-up procedures identified groups of 11

employed, 15 unemployed, and 17 attending college. The findings

obtained from the Standardization sample were applied to the Cross-

validation sample. The Employment Key identified 82% of the working

and 73% of the nonworking in Cross-Validation. Further, discriminant

functions established on the Employment Key and Tolerance scales

classified 82% of the working and 80% of those not presently employed.

The results obtained provisionally suggest some personality

traits which may differentiate the employed from the unemployed. The

employed seem to have stronger feelings of self-worth, to be less

inhibited by excessive fear, and to have a greater capacity for both

adaptive behavior and committment to goal directed activities. The

employed may be more permissive and accepting of the personal beliefs

of others as well as less authoritarian and self-centered than their

unemployed counterparts.

The immediate limitations of this research lie with the

relatively small sample sizes for both the Standardization and Cross-

Validation phases. In addition, unanticipated difficulties encountered

while attempting to locate the relatively young, chronically unemployed

blind suggests that this population may be transient and frequently

out of contact with agencies concerned with assisting the blind to

find employment. The arbitrary criteria for sample selection further

suggest that the subjects of this study cannot be regarded as

representative of the blind in general. It is felt that the sample

does represent certain visually impaired who differ essentially on

current employment status. While these findings must be recognized

as exploratory and provisional, they are promising in that they

may provide a useful approach to employment prediction as well

as indicate the importance of certain relationships between person-

ality traits and the employability of the blind. For those concerned

with manpower development of the blind, it should be emphasized that

the Employment Key scale items and the discriminant functions

presented can be conveniently used on an individual basis. The

validity and usefulness of these findings in other settings will depend

upon the results of such applications.

In conclusion, the CPI appears to be a versatile personality in-

ventory. It is widely researched and its scales are related to a

number of behavioral dimensions. Its usefulness was demonstrated in

this study, both with respect to its apparent suitability for person-

ality measurement of the blind as well as for its power to discriminate

between the employed and unemployed in this study. While recognizing

the limitations of this study on the one hand, there appears to be

sufficient strength on the other to propose that the CPI and these

findings be used in additional research.

Unemployment and underemployment threaten large numbers of

persons each year whose work career is interrupted by deteriorating

vision or injury, or who reached employment age with visual defect.

This loss of manpower to the nation results in economic deprivation

and reduced social status to the individuals afflicted. This study

proposes that those concerned with the evaluation of vocational

potential of the visually impaired consider these findings as an

approach to systematic personality measurement of the blind. It is

suggested that the CPI receive further study for identifying the

relationships between personality traits and such factors as readiness

for vocational training, the need for personal adjustment training, and

the capacity for work responsibilities among the blind.

APPENDIX A

RELEASE OF CASE INFORMATION

RELEASE OF CASE INFORMATION

Date:_____

I hereby authorize the Department of Social Services, Division of Ser-

vices for the Blind to release any part or all of the information in my

case record to Mr. Bernard Bast for his research study which I under-

stand is sponsored by the Federal Government, Department of Labor Grant

91-24-70-14. I further agree to have Mr. Bast interview me and will ac-

cept the five dollars ($5.00) which is allowed to this purpose.

All information obtained will be held confidential and will not be
shared with any agency.

Signed by:_____

APPENDIX B

DESCRIPTIONS OF STANDARDIZATION AND CROSS-VALIDATION SAMPLES

TABLE B.1

CURRENT OCCUPATIONS OF EMPLOYED SUBJECTS
IN STANDARDIZATION SAMPLE

N	Occupation
1	Bread slicer operator (bakery)
1	Bookkeeper
1	Building attendant (City of Detroit)
4	Computer programmers
1	Dairy products processor
8	Darkroom technicians
3	Dictaphone typists
1	Drafting detailer
1	Electroplater
1	Electric motor rewinder
1	Film developer
1	Insurance underwriter
1	Kitchen helper (hospital)
3	Machine operators
1	Musician
1	Piano tuner
2	Porters (nursing home)
2	Packaging small parts (General Motors)
1	Production assembly (General Motors)
1	Production inspection (General Motors)
2	Sales (door to door)
1	Sales (electronic components)
1	Stock receiver (supermarket)
1	Teacher (piano and organ)
1	Varnisher (hotel silverware)
5	Vending stand operators
4	Vending stand and canteen operators
51	Total

TABLE B.2

AGE OF STANDARDIZATION SUBJECTS

Age	Employed		Unemployed	
	N	%	N	%
21-25	5	10	6	12
26-30	12	23	4	8
31-40	15	29	10	20
41-45	5	10	10	20
51-55	7	14	7	14
56-61	2	4	9	18
Totals	51	100	50	100
Mean Age	38.40 yr		43.02 yr	

Mean Age Difference = 4.62 yr

t = 2.02, P < .05

TABLE B.3

TYPE OF VISUAL IMPAIRMENT OF STANDARDIZATION SUBJECTS

Type of Impairment	Employed		Unemployed	
	N	%	N	%
Congenital	39	76	16	32
Progressive	8	16	20	40
Adventitious	4	8	14	28
Totals	51	100	50	100

TABLE B.4

YEARS OF ACADEMIC EDUCATION OF STANDARDIZATION SUBJECTS

Highest Grade Completed	Employed N	Employed %	Unemployed N	Unemployed %
6 and below	1	1	3	6
7-11	8	16	26	52
12	26	51	16	32
1-3 years of college	10	20	3	6
B.A. degree	6	12	2	4
Totals	51	100	50	100
Mean yr education	11.94		10.54	

Mean difference = 1.4 yr
t ratio = 3.58, P < .01

TABLE B.5

FUNCTIONAL VISION OF STANDARDIZATION SUBJECTS

Subject's Preference	Employed N	Employed %	Unemployed N	Unemployed %
Braille and auditory media	27	53	38	76
Large print but prefers Braille	3	6	3	6
Large print with/ without magnification	1	2	0	0
Large print	5	10	3	6
Ordinary print with Magnification	9	17	6	12
Ordinary print	6	12	0	0
Totals	51	100	50	100

TABLE B.6

FUNCTIONAL MOBILITY OF STANDARDIZATION SUBJECTS

Maximum Degree of Travel Independence	Travel Aid (Method)	Employed N	Employed %	Unemployed N	Unemployed %
To new and distant places	Partial vision;	20	39	13	26
	Cane or dog	14	27	8	16
To and from work	Partial vision;	1	2	0	0
	Cane or dog	12	24	0	0
In city to conduct personal affairs	Partial vision;			2	4
	Cane or dog;	3	6	16	32
	Person			1	2
In neighborhood	No aide;	1	2	1	2
	Cane or dog;			7	14
	Person	—	—	2	4
Totals		51	100	50	100

TABLE B.7

MARTIAL STATUS OF STANDARDIZATION SUBJECTS

Marital Status	Employed N	Employed %	Unemployed N	Unemployed %
Single	25	49	18	36
Married	24	47	22	44
Divorced, widowed, separated	2	4	7	14
Divorced, widowed & remarried	0	0	3	6
Totals	51	100	50	100

TABLE B.8

RACE OF STANDARDIZATION SUBJECTS

Race	Employed N	%	Unemployed N	%
Caucasian	43	84	37	74
Black	8	16	13	26
Totals	51	100	50	100

TABLE B.9

AREA OF RESIDENCE OF STANDARDIZATION SUBJECTS

Area	Employed N	%	Unemployed N	%
Urban	49	96	45	90
Urbanized area	2	4	3	6
Rural	0	0	2	4
Totals	51	100	50	100

TABLE B.10

TYPE OF VISUAL IMPAIRMENT OF CROSS-VALIDATION SUBJECTS

Type of Impairment	Employed N	%	Unemployed N	%	Employed, Separately Classified N	%	College Students N	%
Congenital	8	73	7	46	2	67	11	65
Progressive	3	27	5	27	0	0	6	35
Adventitious	0	0	4	27	1	33	0	0
Totals	11	100	15	100	3	100	17	100

TABLE B.11

YEARS OF EDUCATION REPORTED AT TIME OF EVALUATION
OF CROSS-VALIDATION SUBJECTS

Highest Grade Completed	Employed		Unemployed		Employed, Separately Classified		College Students	
	N	%	N	%	N	%	N	%
6 and below	0	0	1	7	0	0	0	0
7-11	3	27	8	53	2	67	2	12
12	7	64	5	33	1	33	14	82
1-3 years of college	1	9	1	7	0	0	1	6
Totals	11	100	15	100	3	100	17	100
Mean yr education	11.636		9.866					

Mean difference: Employed vs. Unemployed = 1.770
$\underline{t}$ = 1.683 n.s.

TABLE B.12

REPORTED VISION OF CROSS-VALIDATION SUBJECTS

Degree of Blindness	Employed		Unemployed		Employed, Separately Classified		College Students	
	N	%	N	%	N	%	N	%
Total or light perception only	2	18	6	40	1	33	5	30
Partial vision (high or low)	9	82	9	60	2	67	12	70
Totals	11	100	15	100	3	100	17	100

TABLE B.13

VERBAL IQ (WAIS) OF CROSS-VALIDATION SUBJECTS

IQ Range	Employed		Unemployed		Employed, Separately Classified		College Students	
	N	%	N	%	N	%	N	%
120 & above	1	9	0	0	0	0	8	47
110 - 119	4	36	2	13	0	0	4	24
90 - 109	6	55	8	53	2	67	5	29
80 - 89	0	0	4	27	0	0	0	0
70 - 79	0	0	1	7	1	33	0	0
Totals	11	100	15	100	3	100	17	100
Mean IQ	107.363		95.800					

Mean difference: Employed vs. Unemployed = 11.563
t = 2.659, P < .05

TABLE B.14

RACE OF CROSS-VALIDATION SUBJECTS

Race	Employed		Unemployed		Employed, Separately Classified		College Students	
	N	%	N	%	N	%	N	%
Caucasian	10	91	11	73	1	33	13	76
Black	1	9	4	27	2	67	4	24
Totals	11	100	15	100	3	100	17	100

TABLE B.15

MARITAL STATUS OF CROSS-VALIDATION SUBJECTS

Marital Status	Employed		Unemployed		Employed, Separately Classified		College Students	
	N	%	N	%	N	%	N	%
Single	6	55	33	100	3	100	15	88
Married	4	36	6	40	0	0	2	12
Divorced	0	0	4	27	0	0	0	0
Widowed	1	9	0	0	0	0	0	0
Totals	11	100	15	100	3	100	17	100

APPENDIX C

INSTRUMENTS UTILIZED IN THE STUDY

1. Interview

Bast: Department of Labor 91-24-70-14

(See coding instructions)

(1)* Employment status: Employed (1), Unemployed (2).... ☐

(2) Code number of subject.............................. ☐☐☐

(3) Address_____ _____
                   Street or route   City

      Urban (1)

      Urbanized area (2)

      Rural (3)

(4) Date of interview_____

(5) Birthdate_____ Age......... ☐☐☐

(6) Do you have any physical or other difficulties, be-
     sides visual impairment, which you consider to be
     a limitation to your employment opportunities?   ☐
     Yes (1), No (2).

      If yes, describe._____

(7) Marital status: .... ☐

      Single (1)

      Married (2)

      Divorced, widowed, or separated (3)

      Divorced or widowed, and remarried (4)

(8) Relationship of current employment status to loss
     of vision:

      Type of onset: Congenital (1), Progressive (2),   ☐
                        Adventitious (3).

_____

*Parentheses indicates that the item is to be coded but
not asked directly of the subject.

Age of onset (defined as the age when visual loss
    became potentially handicapping to employment.

    congenital through two years (1)

    second birthdate through five years (2)

    fifth birthdate through fifteen years (3)

    sixteenth birthdate through twenty years (4)

    twenty-first birthdate through twenty-five years (5)

    twenty-fifth birthdate and later (6)

(9)   Academic education: (Code education received as a
    sighted person in column labeled Before; code
    education received as a visually impaired person
    in column labeled After.)

    Before   After

    See coding instructions.

(10)   Vocational training: (Code Before and After
    as noted above, when appropriate.)

    See coding instructions.

    Record actual time spent.

    Technical school ___yrs., ___months.

    Describe:

    Business school ___yrs., ___months.

    Describe:

    Sheltered workshop/personal adjustment

    ___yrs., ___months.

(11)   Job history:

    Job title and duties (beginning with current or
    most recent job).

    1._____   4._____

    2._____   5._____

    3._____   6._____

7. _____   8. _____

JOB # AS USED ABOVE	CODES			BEGINNING & END DATES MONTH YEAR
	A	B	C	
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

A. Income:

(00) Less than $500	(06) 5001-6000	(12) 12,501-15,000
(01) 501-1000	(07) 6001-7000	(13) 15,001-17,500
(02) 1001-2000	(08) 7001-8000	(14) 17,501-20,000
(03) 2001-3000	(09) 8001-9000	(15) 2C,001-25,000
(04) 3001-4000	(10) 9001-10,000	(16) 25,001-3C,000
(05) 4001-5000	(11) 10,001-12,500	(17) 30,001-and above

B. Approximate number of hours employed per week: 10 (1), 20 (2), 30 (3), 40 (4), 50 (5), 60 (6).

C. Employed as visually impaired. Yes (1), No (2).

(12) Income on current job (annual)........

(13) Approximate number of hours employed per week
on current job:
    10 (1), 20 (2), 30 (3), 40 (4), 50 (5), 60 (6). ......

(14) Years of coninuous employment to date.

(15) Years of continuous unemployment to date.

(16)   Subject's estimate of vision: (check descriptions that
apply)   ☐

    (1) totally blind____

    (2) light and shadows____

    (3) hand movements____

    (4) count fingers____

    (5) use traffic lights____

    (6) recognize faces____

    (7) perceive smiling faces____

    (8) read newspaper headlines____

Functional vision: ☐

How do you do most of your reading?

  (Number the top three in the order in
which the subject uses them.)

(1) Ordinary print without magnification____

(2) Ordinary print with magnification____

(3) Large print____

(4) Braille____

(5) Talking books____

(6) Tapes____

(7) Sighted reader____

Which methods of writing do you use?

    Often (1)

    Sometimes (2)

    Never (3)

(a) Ordinary pen and paper____

(b) Special large pen____

(c) Regular typewriter____

(d) Slate and stylus____

(17) Mobility: (check appropriate aides and extent of travel) □

    A.   To new and relatively distant places.

                     No aide-partial vision (1)____

                     Cane or dog........... (1)____

                     Person................ (4)____

                     Don't go.............. (5)____

          If you travel independently to this extent, what forms of transportation do you use? □

                     Plane____, train____, long distance

                     bus____, suburban bus____, taxi____.

    B.   To and from work (if employed).

                     No aide-partial vision (2)____

                     Cane or dog........... (2)____

                     Person................ (5)____

                       Don't go.............. (6)____

          If you travel independently to this extent, what forms of transportation do you use? □

                     Walk____, bus____, taxi____, driver____.

    C.   In city or town of residence to conduct your own business (code even if employed).

                     No aide-partial vision (2)____

                     Cane or dog........... (2)____

                     Person................ (5)____

                     Don't go.............., (6)____

          If you travel independently to this extent, what forms of transportation do you use? □

                     Walk____, bus____, taxi____, driver____.

    D.   In your neighborhood.

                     No aide.............. (3)

                     Cane or dog.......... (4)

                     Person............... (6)

                     Don't go (homebound). (7)

2. Interview: Coding Instructions

Item	Column	Variable	Code	
(1)	2	Current employment status	Employed	1
			Unemployed	2
(2)	3-5	Code number of subject		001-999
(3)	6	Geographical location*	Urban (comprising those living in places of 2,500 inhabitants or more)	1
			Urbanized area (comprising closely settled places containing at least 50,000 inhabitants or more)	2
			Rural (comprising persons living on farms and places of less than 2,500 inhab.)	3
(4)	-	Date of interview		
(5)	7-9	Years of age	Code actual number from birthdate and date of interview. Do not ask age. Code col 9 in tenths of yrs.	
(6)	10	Vocationally handicapping conditions other than visual impairment	If yes	1
			If none	2
			If not known	3
(7)	11	Marital status	Single (never married)	1
			Married	2
			Divorced, widowed, or sep.	3
			Divorced or widowed, and remarried	4

---

*Adapted from: U.S. Bureau of the Census. U. S. Census Population· 1960, Vol. I, Characteristics of the Population Part A, Number of Inhabitants. U. S. Government Printing Office, Washington, D. C., 1961.

Item	Column	Variable	Code	
(8)	12	Type of onset of visual loss	Congenital	1
			Progressive	2
			Adventitious-Traumatic	3
(9)	14	Age of onset of visual loss	Congenital thru 2 yrs	1
			2 yrs thru 5 yrs	2
			5 yrs thru 15 yrs	3
			16 yrs thry 20 yrs	4
			21 yrs thry 25 yrs	5
			25 yrs and older	6
(10)	15,16	Completed years of education before visual loss, i.e., education as a sighted person	Grade 6	06
			" 7	07
			" 8	08
			" 9	09
			" 10	10
	17,18	Completed years of education as a visually impaired person	" 11	11
			" 12	12
			1 yr college	13
			2 yrs college	14
			3 yrs college	15
			4 or more yrs	16
			B.A.	17
			M.A. or M.S.	18
			Professional degree	19
			Ph.D. or Ed.D.	20

Ex. A subject who has a B.A. and lost his vision in the 11th grade would be coded as such:

Before	After
1 0	0 7

Item	Column	Variable	Code	
(11)	19	Length of time in vocational training (technical or business school) as sighted person	Up to 1 mo	1
			1 mo+ thru 3 mo	2
			3 mo+ thru 6 mo	3
			6 mo+ thru 1 yr	4
			1 yr+ thry 18 mo	5
			18 mo+ thru 2 yrs	6
	20	Length of time in vocational training (technical or business school) as a visually impaired person	2 yrs+ thru 3 yrs	7
			over 3 yrs	8

Item	Column	Variable	Code

Technical school is defined as any institution preparing persons for employment in a skilled trade (electronics, office machines repair, building trades, etc.)

Business school is defined as an institution preparing one for employment in office type skills (bookeeping, dictaphone typing, etc.)

Item	Column	Variable	Code
(12)	--	Employment history	To be coded later

Instruction: Begin with current or last employer and work backward to first employer. Record job title, duties, length of time on each job, income, hours employed per week, whether each employment segment was performed as a sighted or visually impaired person.

Item	Column	Variable	Code	
(13)	21-25	Annual income for 1969 if employed	Record annual income in actual number of dollars.	
(14)	26	Hours employed per week as indicated in item 11.	Under 10 hrs per wk	1
			10+ thru 20 hrs	2
			21+ thru 30 hrs	3
			31+ thru 40 hrs	4
			41+ thru 50 hrs	5
			51+ thru 60 hrs	6
			over 60 hrs per wk	7
(15)	27-28	Duration of employment	Code actual no. of yrs	
	29		Code fraction of a yr in tenths	
(16)	30-31	Duration of unemployment	Code actual no. of yrs	
	32		Code fraction of a yr in tenths	
(17)	33	Functional vision (Subject's estimate)	Check subject's estimate of vision as he reports it. To be coded later.	

<u>Item</u> <u>Column</u>	<u>Variable</u>		<u>Code</u>
34	Functional vision (Primary reading methods used)		
	Ordinary print without magnification	Used most often	1
		Used frequently	2
		Used infrequently	3
		Not used	0
(17) cont'd	Ordinary print with magnification	Used most often	1
		Used frequently	2
		Used infrequently	3
		Not used	0
	Large print	Used most often	1
		Used frequently	2
		Used infrequently	3
		Not used	0
	Braille	Used most often	1
		Used frequently	2
		Used infrequently	3
		Not used	0
	Talking book, tapes	Used most often	1
		Used frequently	2
		Used infrequently	3
		Not used	0
	Sighted reader	Used most often	1
		Used frequently	2
		Used infrequently	3
		Not used	0

Instruction: Code Column 34 according to the following combinations of usable vision.

Ordinary print <u>and</u> ordinary pen and paper and/or typewriter.................................... 1

Ordinary print with magnification <u>and</u> ordinary pen and paper and/or typewriter........................2

Large print <u>and</u> ordinary pen and paper and/or typewriter..3

Item	Column	Variable		Code

Large print (with or without magnification) and special pen or typewriter.............................4

Prefers braille or auditory media for reading, but indicates can write print with ordinary pen, special pen, or large typewriter.........................5

Braille, slate and stylus, talking books, tapes, sighted reader......................................6

(16) cont'd   Functional Vision (Writing methods used by subject)

		Variable		Code
		Ordinary pen and paper	Often	1
			Seldom	2
			Never	3
		Special large pen	Often	1
			Seldom	2
			Never	3
		Regular typewriter	Often	1
			Seldom	2
			Never	3
		Slate and stylus	Often	1
			Seldom	2
			Never	3
(17)	35	Degree of independence in travel	Most independent	1
			Very independent	2
			Moderately independent	3
				4
			Moderately dependent	5
			Very dependent	6
			Most dependent	7

Instructions: Of sections A, B, C, and D (relative to the extent of travel to distant places, to work, in city of residence, or in neighborhood) code (in Column 35) the number which best represents the subject's ability to travel independently.

3. Classes, Scales, and Scale Abbreviations of the CPI*

CLASS I. MEASURES OF POISE, ASCENDANCY, AND SELF-ASSURANCE

1.	Do	Dominance
2.	Cs	Capacity for Status
3.	Sy	Sociability
4.	Sp	Social Presence
5.	Sa	Self-acceptance
6.	Wb	Sense of Well-being

CLASS II. MEASURES OF SOCIALIZATION, MATURITY, AND RESPONSIBILITY

7.	Re	Responsibility
8.	So	Socialization
9.	Sc	Self-control
10.	To	Tolerance
11.	Gi	Good impression
12.	Cm	Communality

CLASS III. MEASURES OF ACHIEVEMENT POTENTIAL AND INTELLECTUAL EFFICIENCY

13.	Ac	Achievement via conformance
14.	Ai	Achievement via independence
15.	Ie	Intellectual efficiency

CLASS IV. MEASURES OF INTELLECTUAL AND INTEREST MODES

16.	Py	Psychological-mindedness
17.	Fx	Flexibility
18.	Fe	Femininity

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APPENDIX D

ADDITIONAL DATA ANALYSES

TABLE D.1

FORMULA FOR ESTIMATING THE MAHALANOBIS
DISTANCE BETWEEN TWO POPULATIONS

$$D_p^2 = \sum_1^p \sum_2^p wij(\bar{x}_i1 - \bar{x}_i2)(\bar{x}_j1 - \bar{x}_j2)$$

where p in the symbol D^2 indicates the number of characters used (Rao,

1936, pp. 246-247);

and

$$wij = \frac{1}{(N_1 + N_2 - 2)} \cdot [\sum_{c=1}^{N_1} (x_i1c - \bar{x}_i1.)(x_j1c - \bar{x}_j1.)$$

$$+ \sum_{c=1}^{N_2} (\bar{x}_i2c - \bar{x}_i2.)(x_j2c - \bar{x}_j2.)]$$

with the first subscript denoting the variate, the second denoting the

group, and the third indicating the individual (Anderson, 1966, p. 169).
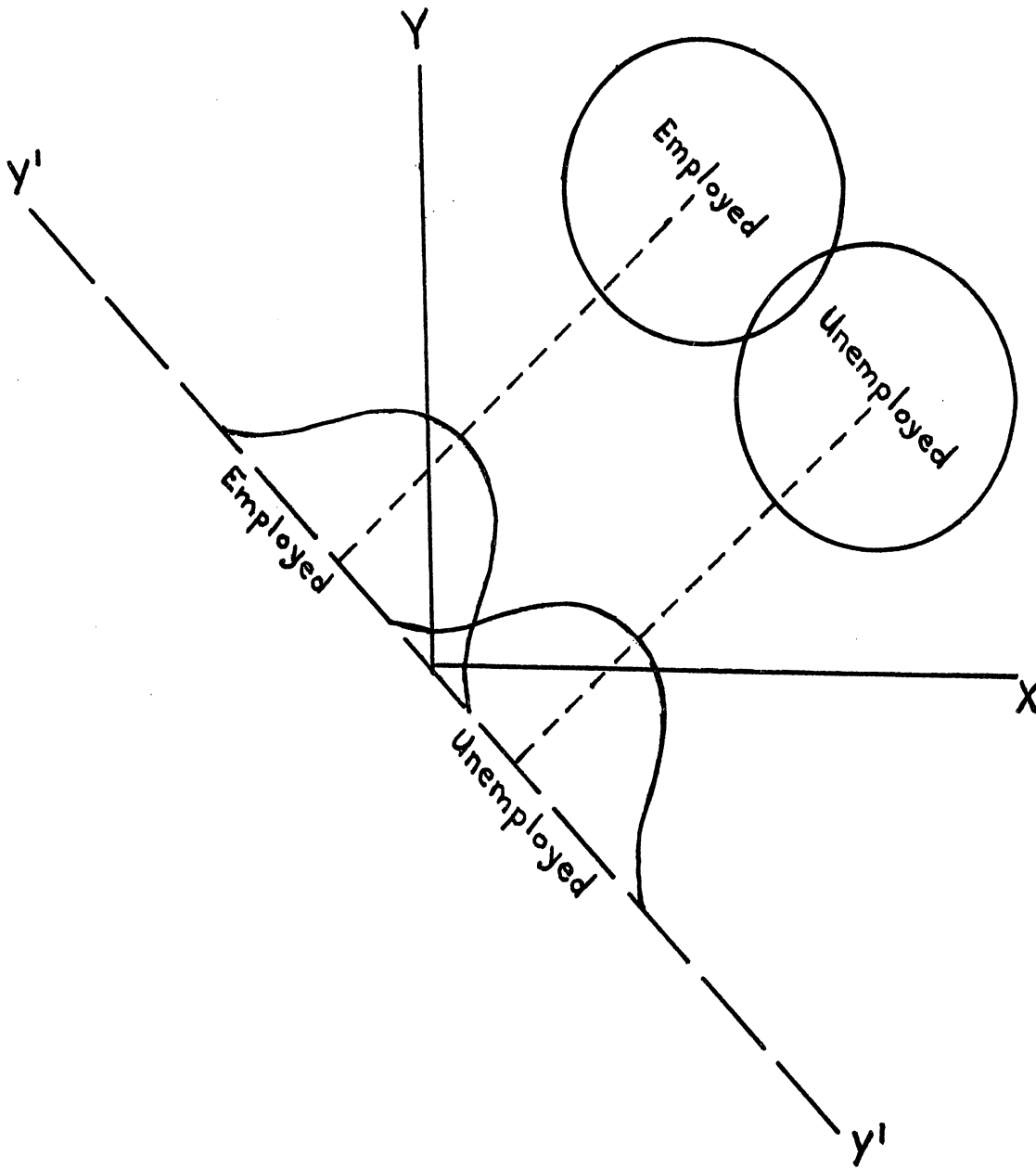
Figure D.1. Projection of "new" scores onto discriminant function Y^1. The discriminant function transforms the individual test scores to a single discriminant score. That score is the individual's location along line Y^1.

TABLE D.2

WITHIN GROUPS CORRELATION MATRIX

	Do	Cs	Sy	Sp	Sa	Wb	Re	So	Sc	To	Gi	Cm	Ac	Ai	Ie	Py	Fx	Fe
Cs	.57																	
Sy	.75	.67																
Sp	.59	.67	.69															
Sa	.74	.58	.72	.70														
Wb	.35	.35	.39	.40	.26													
Re	.40	.48	.30	.25	.22	.50												
So	.01	.12	.02	-.07	-.05	.45	.46											
Sc	-.11	.15	-.08	-.12	-.25	.54	.41	.53										
To	.32	.62	.39	.56	.28	.62	.63	.29	.47									
Gi	.23	.33	.25	.05	.04	.48	.29	.37	.70	.37								
Cm	.19	.18	.30	.22	.20	.34	.23	.09	-.03	.10	-.20							
Ac	.52	.51	.54	.28	.43	.50	.58	.40	.38	.44	.45	.26						
Ai	.26	.53	.26	.50	.27	.44	.50	.11	.38	.78	.31	-.09	.35					
Ie	.51	.71	.63	.66	.48	.57	.60	.21	.28	.76	.27	.27	.58	.68				
Py	.42	.55	.38	.46	.40	.33	.33	.05	.30	.55	.37	.07	.38	.58	.53			
Fx	.10	.29	.11	.50	.20	-.03	.09	-.22	-.05	.38	-.10	.21	-.07	.52	.24	.38		
Fe	-.39	-.31	-.45	-.42	-.39	-.31	-.02	.20	.11	-.22	-.03	-.28	-.15	-.15	-.41	-.27	-.05	
Ek	.45	.62	.45	.64	.38	.58	.52	.12	.29	.77	.26	.21	.33	.71	.70	.53	.41	-.27

TABLE D.3

EMPLOYMENT KEY ITEMS

Item No.	Item	Scale(s) of CPI Origin	Direction Scored	Chi Square Ratio
13.	I am very slow in making up my mind.	Fe(F)*	False	7.21
41.	For most questions there is just one right answer, once a person is able to get all the facts.	Ai(F)	False	7.14
47.	Women should not be allowed to drink in cocktail bars.	Sa(F), Sp(F), Cs(F),	False	17.8
79.	I am afraid of deep water.	Cs(F)	False	7.2
90.	As long as a person votes every four years, he has done his duty as a citizen.	Re(F)	False	7.5
128.	It takes a lot of argument to convince most people of the truth.	Cs(F)	False	9.6
154.	I like tall women.	Cs(T)	True	14.3
182.	I would rather go without something than ask for a favor.	Sa(F), So(F)	False	8.9
184.	I have had more than my share of things to worry about.	Ie(F), To(F), So(F)	False	8.6
210.	I very much like hunting.	Do(F), Fe(F), Re(F)	False	7.4
225.	People pretend to care more about one another than they really do.	Ai(F), Sy(F)	False	6.7

*(T) = true
 (F) = false

TABLE D.3 (Concluded)

Item No.	Item	Scale(s) of CPI Origin	Direction Scored	Chi Square Ratio
237.	The future is too uncertain for a person to make serious plans.	Ai(F), To(F)	False	14.5
261.	We ought to let Europe get out of its own mess; it made its bed, let it lie in it.	Re(F)	False	6.6
300.	Police cars should be especially marked so that you can always see them coming.	Sc(F), Sa(T), Re(F)	False	12.1
311.	I cannot do anything well.	Cm(F)	False	8.9
338.	I never worry about my looks.	So(F)	False	8.6
372.	I have reason for feeling jealous of one or more members of my family	Wb(F)	False	7.3
377.	Most of the arguments or quarrels I get into are over matters of principle.	Fx(F)	False	7.8
383.	I usually have to stop and think before I act even in trifling matters.	Do(F)	False	8.3
425.	I have often felt guilty because I have pretended to feel more sorry about something than I really was.	Wb(F)	False	7.4
452.	I dislike to have to talk in front of a group of people.	Do(F)	False	12.6

TABLE D.4

COMPARISON OF SCALE MEANS ACROSS STANDARDIZATION
AND CROSS-VALIDATION SAMPLES

| CPI Scales | Standardization Sample | | Cross-Validation Samples | | |
| | Employed | Unemployed | Working | Not Working | College Students |
	N=51	N=50	N=11	N=15	N=17
Dominance	29.35	25.74	27.18	23.00	29.00
Capacity for Status	18.82	15.60	19.09	15.06	17.88
Sociability	24.76	22.78	26.00	21.93	25.76
Social Presence	33.50	30.22	33.72	31.33	36.23
Self-acceptance	20.49	18.76	20.90	18.60	22.29
Well-being	36.76	33.44	37.36	34.53	35.64
Responsibility	30.35	28.06	28.63	24.53	29.58
Socialization	35.88	33.38	35.36	33.26	36.00
Self-control	30.56	28.34	29.72	27.93	25.70
Tolerance	19.62	16.42	19.18	17.80	20.47
Good Impression	20.60	19.18	19.63	18.46	16.88
Communality	26.56	24.98	25.09	25.20	25.88
Achieve.-Conform.	27.33	24.48	26.27	23.00	25.76
Achieve.-Independ	16.60	13.26	15.00	13.80	18.47
Intellect. Effic.	35.72	32.48	35.63	34.00	37.35
Psych. Minded	10.98	9.22	10.00	10.46	10.35
Flexibility	6.54	5.30	6.90	6.13	9.47
Femininity	18.17	18.44	16.72	16.46	16.05
Employ Key	14.84	9.16	13.36	10.73	13.88

TABLE D.5

COMPARISON OF SCALE STANDARD DEVIATIONS ACROSS
STANDARDIZATION AND CROSS-VALIDATION SAMPLES

CPI Scales	Standardization Sample		Cross-Validation Samples		
	Employed	Unemployed	Working	Not Working	College Students
	N=51	N=50	N=11	N=15	N=17
Dominance	6.03	6.46	5.67	5.89	7.54
Capacity for Status	4.38	4.26	4.03	4.69	3.58
Sociability	5.12	5.55	3.66	6.61	3.89
Social Presence	6.10	5.96	4.02	6.61	6.49
Self Acceptance	3.80	4.17	3.78	3.64	4.17
Well-being	4.94	6.02	5.73	5.16	3.58
Responsibility	4.91	5.03	3.72	7.06	4.34
Socialization	6.21	5.67	6.15	6.00	4.55
Self-Control	6.52	7.19	8.77	8.16	5.57
Tolerance	6.01	5.53	4.33	5.82	3.84
Good Impression	5.32	5.82	6.40	7.46	4.15
Communality	1.61	2.72	3.72	2.36	1.93
Achiev.-Conform	4.79	4.66	4.31	7.32	4.67
Achieve.-Indep.	4.09	4.87	3.74	3.02	4.12
Intell. Effic	6.03	6.66	3.38	7.07	3.69
Psych. Minded	2.95	2.42	2.52	2.58	2.59
Flexibility	3.78	3.64	3.91	2.26	4.04
Femininity	3.99	3.75	3.34	4.32	3.74
Employ. Key	2.58	3.57	3.44	2.73	2.99
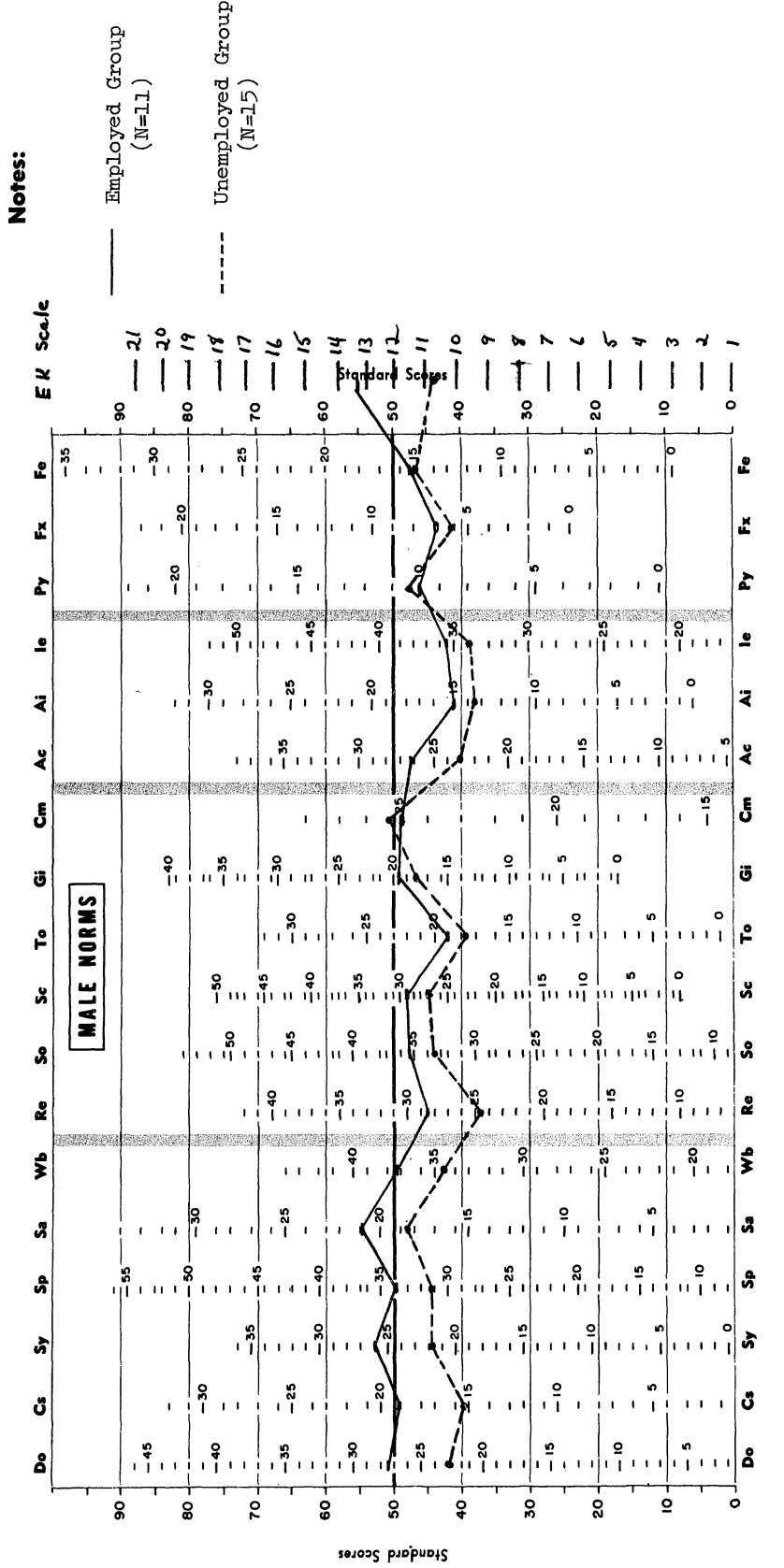
Figure D.2. Comparison of mean scale scores of working and non-working Cross-Validation subjects.
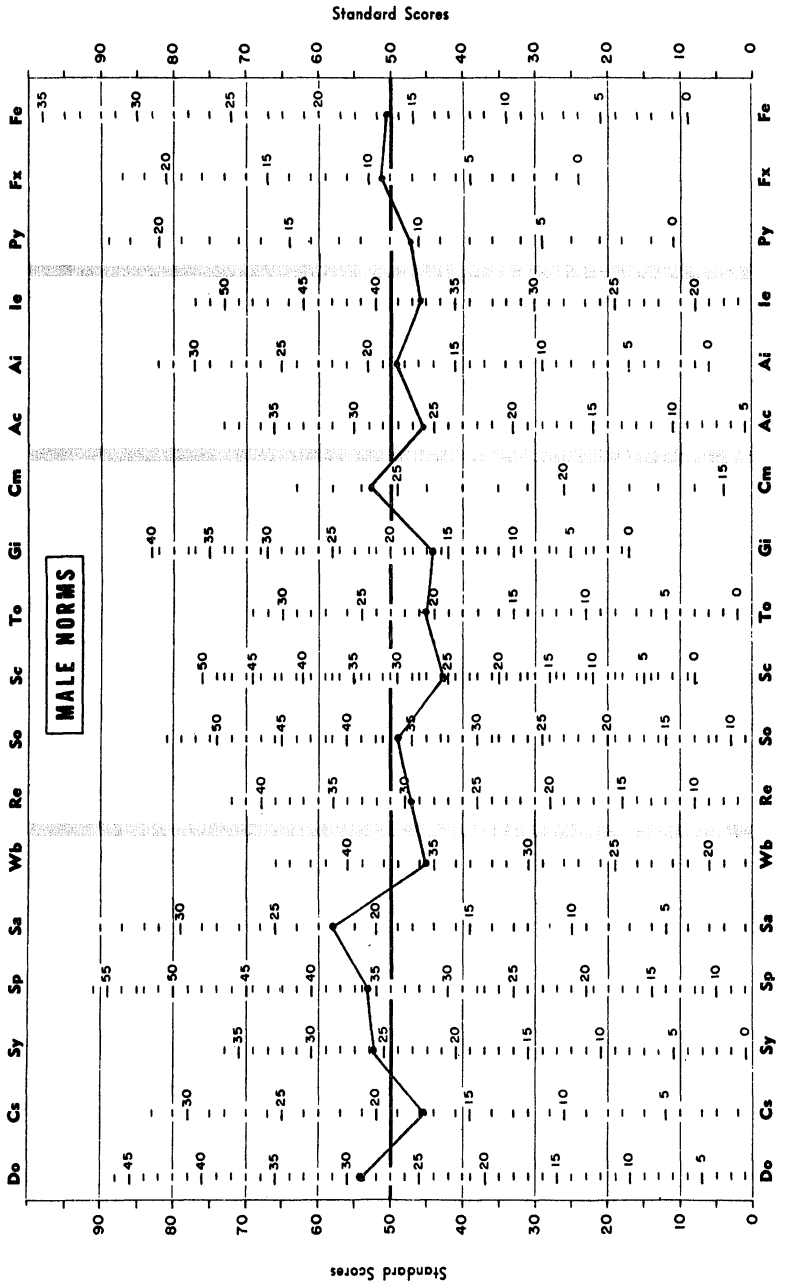
Figure D.3. Mean scale scores of college students in the Cross-Validation sample.

TABLE D.6

CROSS-VALIDATION SUBJECTS' ACTUAL GROUP MEMBERSHIP, PREDICTED
CLASSIFICATION, SQUARED MAHALANOBIS DISTANCES, AND
ASSOCIATED PROBABILITY OF PREDICTED GROUP
MEMBERSHIP FOR THE TWO-VARIABLE EQUATIONS

Group 1
WORKING
CASE

1	EMPLOY	0.848(0.674)	2.305(0.326)
2	EMPLOY	1.019(0.992)	10.612(0.008)
3	UNPLOY	16.196(0.002)	3.744(0.998)
4	EMPLOY	1.529(0.507)	1.582(0.493)
5	UNPLOY	4.068(0.135)	0.355(0.865)
6	EMPLOY	0.425(0.752)	2.643(0.248)
7	EMPLOY	0.222(0.929)	5.366(0.071)
8	EMPLOY	0.928(0.988)	9.760(0.012)
9	EMPLOY	1.947(0.687)	3.523(0.313)
10	EMPLOY	2.216(0.984)	10.445(0.016)
11	EMPLOY	1.013(0.810)	3.914(0.190)

Group 2

NOT WORKING CASE		EMPLOYED	UNEMPLOYED
1	UNPLOY	7.560(0.266)	5.527(0.734)
2	UNPLOY	2.427(0.403)	1.640(0.597)
3	UNPLOY	3.562(0.243)	1.292(0.757)
4	UNPLOY	6.838(0.048)	0.880(0.952)
5	UNPLOY	10.199(0.018)	2.196(0.982)
6	EMPLOY	1.013(0.810)	3.914(0.190)
7	EMPLOY	0.680(0.905)	5.182(0.095)
8	UNPLOY	6.532(0.068)	1.296(0.932)
9	UNPLOY	2.127(0.324)	0.658(0.676)
10	UNPLOY	3.218(0.186)	0.266(0.814)
11	UNPLOY	7.471(0.036)	0.911(0.964)
12	UNPLOY	9.110(0.018)	1.067(0.982)
13	EMPLOY	1.265(0.759)	3.562(0.241)
14	UNPLOY	3.262(0.189)	0.350(0.811)
15	UNPLOY	3.741(0.183)	0.750(0.817)

TABLE D.7

CROSS-VALIDATION SUBJECTS ACTUAL GROUP MEMBERSHIP, PREDICTED
CLASSIFICATION, SQUARED MAHALANOBIS DISTANCES, AND
ASSOCIATED PROBABILITY OF PREDICTED GROUP MEMBER-
SHIP FOR THE FIVE-VARIABLE EQUATIONS

Group 1
WORKING
CASE

1	EMPLOY	1.105(0.774)	3.565(0.226)
2	EMPLOY	3.318(0.998)	16.103(0.002)
3	UNPLOY	23.154(0.000)	6.683(1.000)
4	UNPLOY	5.584(0.233)	3.200(0.767)
5	UNPLOY	6.048(0.082)	1.211(0.918)
6	EMPLOY	1.935(0.700)	3.626(0.300)
7	EMPLOY	1.433(0.972)	8.542(0.028)
8	EMPLOY	3.210(0.971)	10.222(0.029)
9	EMPLOY	2.938(0.877)	6.865(0.123)
10	EMPLOY	4.494(0.997)	16.061(0.003)
11	EMPLOY	5.737(0.734)	7.764(0.266)

Group 2
NOT WORKING
CASE

1	UNPLOY	12.129(0.247)	9.802(0.753)
2	UNPLOY	15.856(0.036)	9.306(0.964)
3	UNPLOY	6.928(0.158)	3.579(0.842)
4	UNPLOY	18.369(0.008)	8.711(0.992)
5	UNPLOY	11.492(0.035)	4.877(0.965)
6	EMPLOY	6.242(0.981)	14.105(0.019)
7	EMPLOY	5.782(0.676)	7.255(0.324)
8	UNPLOY	26.433(0.004)	15.358(0.996)
9	UNPLOY	9.150(0.409)	8.418(0.591)
10	UNPLOY	4.844(0.108)	0.618(0.892)
11	UNPLOY	9.736(0.018)	1.712(0.982)
12	UNPLOY	12.386(0.006)	2.246(0.994)
13	EMPLOY	4.099(0.812)	7.021(0.188)
14	UNPLOY	10.924(0.032)	4.(97(0.968)
15	UNPLOY	5.285(0.154)	1.883(0.846)

PROFILE SHEET FOR THE *California Psychological Inventory:* **MALE**
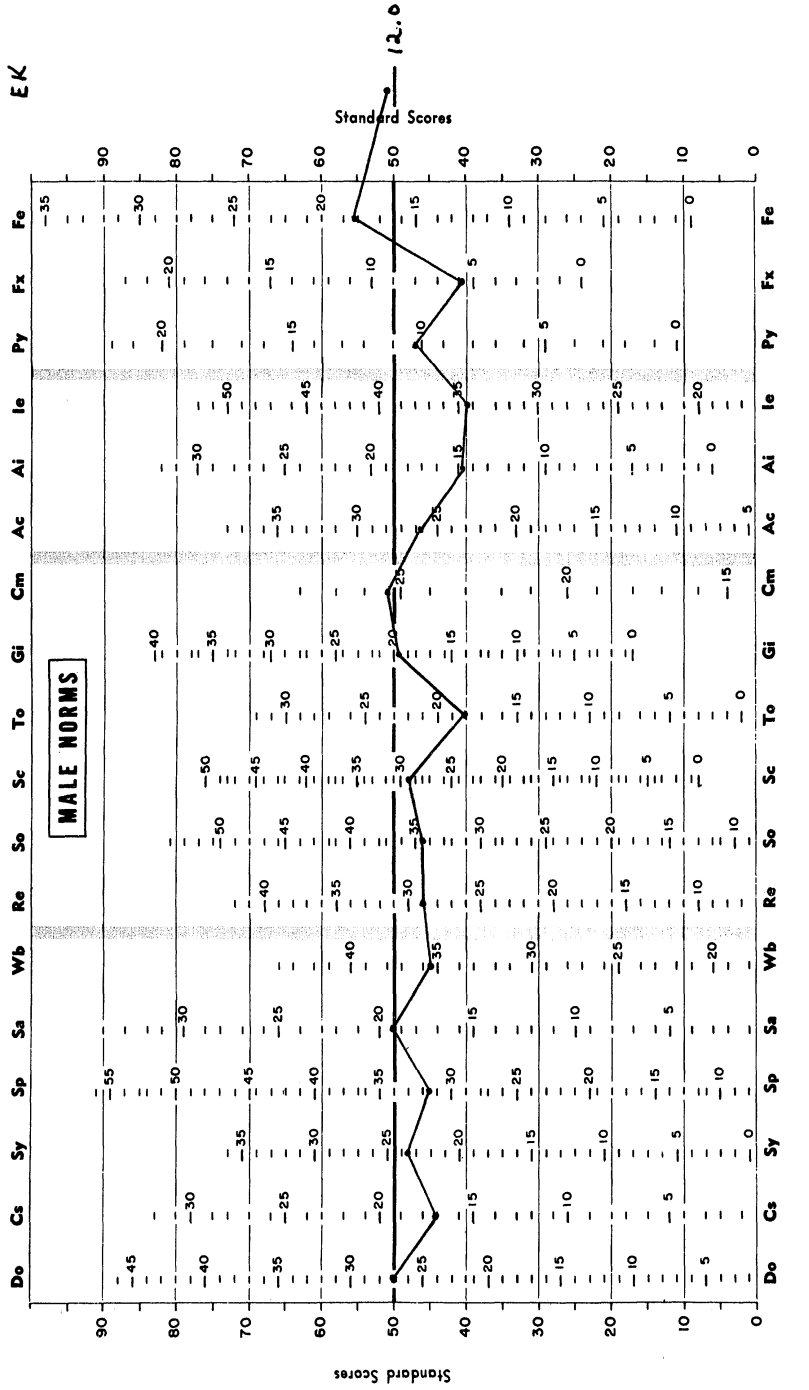
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12.0

Standard Scores

MALE NORMS

Figure D.4. Grand mean scale scores across all groups.

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