

URBAN POLICE APPLICANT MMPI SCORE
DIFFERENCES DUE TO EMPLOYMENT
CLASSIFICATION AND GENDER

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CHAPTER I

INTRODUCTION

Introduction to the Problem

Chenoweth (1961) traced modern screening of police applicants back to September 29, 1829 when the Metropolitan Police of London, England began their official first day of duty. Twenty-eight hundred men were recruited into that police organization and 2,238, almost 80%, had to be dismissed from the department. Every officer had been hand-picked using a very careful selection system. Each applicant had to submit three written recommendations of their character with one being from his last employer. The authors of these recommendations were interviewed in person and if the applicant passed through this stage, he had a medical examination which meant an inquiry regarding his general intelligence and physical qualifications. More than two-thirds of the applicants were rejected at this stage. Those accepted were interviewed by an experienced personnel officer who eliminated those deemed obviously not suited for police work and passed the remaining applicants on to the first two Commissioners of the Metropolitan Police for another interview. If either Commissioner disapproved an applicant, the applicant was rejected. Although this system of police screening began over 155 years ago, it continues to be the basic evaluation procedure used by urban police agencies today. Thus, the genesis which evolved into the current methodology of personal references, background investigations, medical exams, physical and mental tests and the oral interview can be easily seen.

Despite the increased efficiency in assessing police applicants, too often it has been found that an applicant whose personality, capabilities and experiences seemed very acceptable for police work were not. This seems to have stimulated the inclusion of psychological testing in most urban agencies use today. Psychological tests provide systematic and objective procedures for comparing differences in behavior between persons or groups of persons. They also allow attempts to predict future behavior (Chenoweth, 1961).

The National Advisory Commission on Criminal Justice Standards and Goals published its final report in 1973 recommending specific standards for the selection of police officers (Cohen & Chaiken 1973). These standards specified that police agencies employ a formal process for the selection of qualified applicants. The report also recommended the process include a written test of mental ability or aptitude, an oral interview, a physical examination, a psychological examination and an in-depth background investigation.

Procedures used to select police officers are the central component to ensuring the employment of applicants who meet the recommended standards of the National Advisory Commission (Cohen & Chaiken, 1973). Law enforcement officials have long recognized this fact but have lacked effective selection predictors. Most police departments utilize a variety of techniques and screening procedures for selecting police officers but there is little objective evidence with regard to the validity and reliability of these methods. Consequently, applying the results of unvalidated instruments have contributed to the selection of persons unqualified for police work (Spielberger, 1979).

Although there is a consensus of agreement, both within and outside police departments, regarding the improvement of police personnel, the selection standards that should be used to achieve this goal are a matter of disagreement. This seems to be partially due to the complexity of the police officer's role in

modern society. Police officers are expected to prevent crime, apprehend criminals, settle domestic disputes, aid accident victims, direct traffic, control riots as well as handle many other stressful situations. They are constantly confronted with a decision to respond appropriately to a wide range of potentially explosive circumstances (Cohen & Chaiken, 1973; Gottesman, 1975). Thus, the question arises as to what sort of characteristics or qualities a person should possess who is selected as a police officer and will have to function in such diverse activities. Police officers need to be reasonably objective, rational and in control of their impulses sufficiently enough to act appropriately under conditions of extreme stress (Gottesman, 1975). Police officer misconduct toward society has been well documented by both the President's Commission on Law Enforcement and the news media's reports of behaviors. Misconduct has ranged from rolling drunks and accepting bribes to brutality and large scale burglary rings (Spielberger, 1979). Thousands of dollars are lost each year relative to the training of officers who will later be dismissed due to misconduct (Spielberger, 1979). These factors have intensified interest in refining techniques used in screening out unacceptable applicants and selecting those who will prove to be stable and successful.

The increasingly complex and critical role of police officers in urban American society underlines the importance of valid and reliable screening/selection predictors (Cohen & Chaiken, 1973; Gottesman, 1975; Spielberger, 1979). State, county and city health departments, as well as police departments who employ their own psychologists, participate in the screening and selection of police officers (Levy, 1967). Making a decision through the use of test results and background information as to whether or not an individual belongs to one group rather than another is an ongoing challenge to the behavioral scientist. Psychologists are often commissioned to engage in such prediction (Johnson, 1983).

It is the intention of the present study to investigate the Minnesota Multiphasic Personality Inventory's (MMPI) utility in differentiating between acceptable and unacceptable male and female police applicants. Research indicates that a wide range of differences exist among successful male policemen and that, consequently, research should be focused on the variables which may predict failures (Levy, 1967). A second focus is to study the relationship of gender to applicants' MMPI scores and report female urban police applicants' norms which have not been previously reported.

Brief Review

Research studies to date show mixed results regarding the use of the MMPI to effectively screen psychopathology in police applicants and few have reported MMPI results on female applicants. Those data which are reported are primarily focused on selecting successful applicants rather than screening psychopathology. Saccuzzo, Higgins and Lewandowski (1974) studied 196 MMPI profiles of two groups of male metropolitan and non-metropolitan candidates for police certification. While they did not study differences between acceptable and unacceptable applicants, they reported that if psychopathology is present in police officers, it will most commonly be manifested as a character disorder as described by the elevated 4-9 (Psychopathic-deviate (Pd)/Hypomania (Ma)) or 4-3 (Psychopathic deviate (Pd)/Hypochondriasis (Hs)) MMPI profile code type. Matzarazzo, Allen, Saslow and Wiens (1964) support the 4-3 code type. The elevated 4-9 and 4-3 code types are described by Lachar (1969) as: mildly independent, rebellious, resentful and non-conforming with a limited frustration tolerance and highly energetic. Impulsivity and acting-out tendencies are generalized or appear in the behavioral areas indicated by other scale elevations. These individuals are often described as naive and self-centered needing to see

themselves in a favorable light and lacking insight into their interpersonal relations.

Several studies have examined and utilized the MMPI in police selection and reported on its validity. Schoenfeld, Kobos and Phinney (1980) studied the validity of the MMPI in predicting poor field performance and the interrater reliability of two experienced judges using 424 male police applicant MMPI profiles in a clinically simulated selection process. They were asked to make recommendations for acceptance or rejection of police applicants on the basis of blind examination of the profiles. They concluded that they had not adequately assessed the validity question because the study was not well controlled and that the criterion variable of field police performance is a multifaceted phenomenon requiring analytic inspection. Regarding interrater reliability, they concluded that police applicants may be subjected to a variety of rater biases given lack of knowledge as to what constitutes emotional suitability or unsuitability for law enforcement work.

Costello and Schoenfeld (1981) studied time-related effects on MMPI profiles of 1,119 male police academy recruits who survived the screening process and reported that the MMPI would be useful only to detect those applicants so disturbed that they are unable to conform their test behavior to fit ordinary broad performance standards. Merian, Stefan, Schonfeld and Kobos (1980) conducted an item analysis of 424 male police cadets and established a 5-item MMPI index discriminating acceptable from unacceptable police officers, concluding that the index appears to have sufficient validity to warrant further research.

Saxe and Reiser (1976) compared the mean profiles of three Los Angeles male police applicant groups in order to examine the utility of the MMPI as a tool differentiating among police applicants and in predicting success or failure.

They found significant differences in MMPI scores between successful, attrition and rejected groups with the differences being well within the normal range and too small in terms of traditional standard scores to have meaningful utility in clinically differentiating between successful and unsuccessful police applicants. Knatz and Inwald (1983) describe an up-to-date procedure for screening out law enforcement candidates who might break under stress. The MMPI was one of the instruments used for all applicants but they report no MMPI results.

Bartol (1982) investigated the use of the MMPI for differentiating between above average, average and below average applicants. The study reported the results of a long-term ongoing project of psychological screening for small-town (50,000 or less) Vermont police departments. Women were not included in this study because very few had been tested. Using a t-test, he found that the Hypochondriasis (Hs), Psychopathic deviate (Pd), Hypomania (Ma), Psychasthenia (Pt) and Schizophrenia (Sc) scale scores were significantly more elevated for the below average than the average or above average groups. Additionally, he used uncorrected scale scores theorizing that adding the correction score (K) to the scores spuriously increases the differences between groups.

Since women have only recently occupied police officer positions in sufficient numbers for research, there are very few available studies regarding females (Inwald & Shusman, 1984). Among the studies that were available, Spielberger (1979) compared 168 caucasian males and 43 females retained or terminated by Florida police agencies. Successful female officers significantly differed from female failures in that the successful group reported being either currently or previously married and were not particularly bothered by bragging co-workers. Using the California Psychological Inventory (CPI), Spielberger found that successful females scored significantly higher than failures on scales measuring capacity for status, sense of well being, responsibility, self-control,

tolerance, good impression, achievement via independence, intellectual efficiency and psychological mindedness. Unfortunately, he did not investigate differences using the MMPI.

Inwald and Shusman (1984) studied retention-termination rates of 748 male and 157 female correction officer candidates who were subsequently hired and stayed on the job for one year. They examined the response patterns on the Inwald Personality Inventory (IPI) and the MMPI evaluating gender differences on biographical data and job performance indicators. Examining gender differences of 1,887 male and 520 female correction officer candidates, they compared means and found that females scored higher on psychasthenia, schizophrenia and social introversion scales and lower on the MMPI K scale. No F test was performed.

Statement of the Problem

Inherent in this study was the emphasis that the MMPI was originally designed to objectively detect psychopathology, not select successful job applicants. Therefore, it is better suited for screening out unacceptable applicants rather than selecting those who will later prove to be successful. The problem to be investigated in this study is if the MMPI scores are effective in differentiating between acceptable and unacceptable urban police department applicants. Until recently, studies using the MMPI to screen out unacceptable police applicants have used male subjects but did not report what criteria they used to distinguish between acceptable and unacceptable applicants. Those studies also focused on the MMPI's utility in predicting future successful police officers rather than its original intended purpose of screening out applicants exhibiting psychopathology. This study reported female norms on the MMPI, that have not previously been reported.

This problem is important to study in order to possibly save human life, taxpayer dollars and time, as well as increase the efficiency and validity of psychological screening of unacceptable applicants.

Purpose and Objectives of the Study

The purposes of the study are: (1) To establish more valid and reliable screening criteria used to reject unacceptable urban police applicants; (2) To collect and report acceptable and unacceptable female urban police applicant norms on the MMPI not previously reported by other research; and (3) To investigate and examine whether or not acceptable and unacceptable male and female urban police applicants typically present the same personality profiles on the MMPI. If not, then the evaluator may need to consider gender as a factor when assessing police applicants. Significantly different norms may exist for females than for males. If significant differences between acceptable and unacceptable applicants are found, then the evaluator may be able to use future applicant's MMPI scores more practically in screening out unacceptable applicants.

Statement of the Hypotheses

- Ho₁ There are no significant discriminating clinical or validity MMPI scales on which acceptable and unacceptable urban police applicants differ.
- Ho₂ There are no significant discriminating clinical or validity MMPI scales on which acceptable and unacceptable male urban police applicants differ.
- Ho₃ There are no significant discriminating clinical or validity MMPI scales on which acceptable and unacceptable female urban police applicants differ.

Ho₄ There are no significant differences between male and female police applicants based on the distribution of their MMPI scores.

Definition of Terms

Minnesota Multiphasic Personality Inventory Form R (MMPI): An objective psychodiagnostic self-report inventory used to assess some of the major psychopathological characteristics that affect personal and social adjustment.

Police Applicant: A man or woman who completes a police employment application, personal history questionnaire, background investigation questionnaire, reading comprehension test, writing skills tests, physical agility test, and MMPI.

Unacceptable: A police applicant who has completed the employment process and is classified by the Chief of Police and/or the personnel director as unemployable.

Acceptable: A police applicant who has successfully completed the employment process and is classified by the Chief of Police as employable.

Education: This is the highest level of education in years recorded by the person on their application.

Age: This is the number of years recorded by the person on their application.

Limitations of the Study

Since police applicant composition may differ substantially from one geographical location to another, the findings in this study will be generalizable to police applicants applying for employment in cities with populations similar to the one used in this research. Likewise, selection factors that were operative prior to the beginning of the study restrict the range of the sample available and curtail the generalizability of the findings for gender score differences and employment classification to any group other than the base

group. Lastly, since the weight of the MMPI scores' contribution to the final selection decision is unknown, the results regarding group membership can be generalized only to the population studied.

Summary and Overview of Remaining Chapters

The critical importance of effective police applicant screening to police departments, citizens and behavioral scientists seems apparent. However, it is noted that this study is not advocating the prediction of those who will prove to be successful or not, but instead is attempting to improve the quality of police officer personnel by focusing on more valid methods of screening out unacceptable applicants. This will be an important contribution to the selection process. Realizing that police screening is only one aspect of the many variables involved in police selection and having placed the significance of this research into an appropriate perspective, a review of the publications and research on police selection procedures in England since 1829 and the United States since about 1900 follows in Chapter II. Chapter III presents the methods and procedures and Chapter IV the statistical analysis results. Chapter V reviews the study and discusses the implications and conclusions derived from the analysis.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The following literature review examines six areas: history of selecting police applicants; psychological assessment of police applicants; use of the MMPI in clinical practice and research; selecting female police officers; police applicant gender and MMPI results; and police applicant employment classification and MMPI results. The studies are integrated as they apply to gender and employment classification relative to MMPI results which lays the foundation for the investigation.

History of Selecting Police Applicants

As indicated previously, Chenoweth (1961) traced modern screening of police applicants back to September 29, 1829 when the Metropolitan Police of London, England began their official first day of duty. Each applicant was hand-picked using a very careful selection system. Applicants had to submit three written recommendations of their character, their references interviewed, and pass a medical evaluation of their general intelligence and physical qualifications. More than two-thirds were rejected at this stage. Those accepted were interviewed by an experienced personnel officer who eliminated those obviously not suited for police work. The remainder were passed on to the first two Commissioners of the Metropolitan Police who interviewed them. This system of police screening began over 155 years ago, but it continues to be the basic evaluation procedure used by urban police agencies today.

Holmes (1942) traced the next most significant step in improving the selection system of police personnel to the Civil Service Reform movement of 1883. He stated:

. . . the Civil Service Reform movement originated in 1883 as a result of public antagonism toward the 'spoils system.' This reform was designed to employ government personnel on the basis of open competitive examinations and to insure relative tenure in office. The examinations used were originally designed to test for certain minimum educational qualifications recognized as essential to the performance of the job in question. As a whole, they were practically useless as an instrument of prognosis, and as a rule were so weak that they did not even serve as a means of eliminating the markedly unfit. In the course of time, as experience was accumulated in modes of testing and public pressure for an improved personnel was felt, the examinations were constructed progressively more difficult and so served as a crude instrument for the elimination of the unfit (p. 575-576).

The next most significant step in selecting police applicants was applied by Terman in 1916. Terman had been successful in using psychological tests for the selection of military personnel just prior to, during, and after World War I. In 1917, Terman proposed the use of mental and pedagogical tests in the selection of policemen and firemen. Terman was the first to apply the use of psychological tests in selecting policemen and firemen and published his results in the first volume of the *Journal of Applied Psychology*, 1917.

Terman and Otis of Stanford University had their graduate students administer the newly constructed Stanford Revision of the Binet-Simon Intelligence Test to San Jose, California police applicants just after its original publication in 1916 (Gottesman, 1975; Holmes, 1942; Johnson, 1965). This experiment was based on their assumption that general intelligence could be measured with a fair degree of success and that general intelligence was the most important factor, except for moral integrity, in assessing the fitness of a policeman or fireman applicant.

The applicants were also given several achievement tests as well as an interview, medical examination, and tests of physical strength and agility. They tested thirty (30) applicants for the two job types. The applicants ranged in age from 21 to 38 with a median age of 30. Terman did not provide precise numbers for their education level but reported it as either the sixth or seventh grade. Their Stanford-Binet, short version, median IQ was 89. Using his normative studies as a guide, Terman recommended that an IQ of 80, the bottom end of the dull normal range, be established as a cutoff score in selecting acceptable candidates. This eliminated ten of the thirty including four who had been serving as extras on the police force. The median IQ for the remaining 20 candidates was 89, the top of the dull normal range, and the education level was probably seventh grade (Johnson, 1964).

Vollmer (1921), then Chief of Police at Berkeley, California and later professor of police administration at the University of California, published his suggestions on the use of modified army screening and selection techniques for police candidates. He wrote:

If the army (Army Alpha test) plan were adopted by civil service examiners for selecting police candidates we would be certain that such misfits as the stupid, hot-headed, sullen, cranky, slow, slovenly, unreliable and brutal would never get into the service. Supplementing the army method of selection, special examinations should be held to determine the education, training and experience of candidates for positions in the department (p. 576).

Two years later, Martin (1923) of Columbia University and the Civil Service Commission of Newark, New Jersey published the results of their study on aptitude tests for police. They examined the effectiveness of using mental tests for police selection. They found that the correlation between test results and later actual police performance criteria was $-.01$, or no better than chance. Interpretively, the tests were not effective in predicting successful police performance.

Three years later, O'Rourke (1926) devised a test to determine the ability of an individual to adapt himself to new situations. The test was composed of one hundred questions based on practical knowledge. It attempted to examine an individual's ability to analyze written material and situations and problem solve through the use of observation, judgment, and memory. By comparing test scores with efficiency ratings of the Washington, D. C. police force, he found that 80 percent of the men scoring the highest 25 percent of the test scores on the examination, developed above average efficiency ratings. He also reported that of those who scored in the top 25 percent on the examination, 100 percent were rated above average in the police school and of those that scored in the lower 25 percent of the test, none had efficiency ratings above average.

However, when O'Rourke's test was administered to the entire police department at Berkeley, California, Vollmer reported in private correspondence that 100 percent of the personnel passed the examination with a score of 95 percent or better. Apparently the quality of the Berkeley police was at a much higher level than the Washington police, therefore the test could not effectively discriminate among qualified personnel.

Significant publications regarding police selection were few until Holmes (1942) published an article proposing a police selection program. Holmes correlated aptitude tests with intelligence tests observing a high correlation and deduced that aptitude tests may be used as checks on intelligence tests. Holmes also noted that the development of an effective police selection program required a detailed job description that would identify what police actually do on the job. After examining all the descriptions, Holmes concluded that since a policeman's job was so complex, it was necessary to analyze the integration of the performance of the work rather than to consider individual traits one by one.

Holmes reported the following as desirable characteristics for the policeman:

. . . accurate memory and observation, reasonability, analytical judgment, ability to follow directions, ability to organize material, mental alertness and speed of decision, judgment (common sense), determination, social intelligence (understanding human nature) and aggressiveness (p. 578).

Holmes proposed a definite order of selection procedures and that where possible, tests be administered in groups in order to save time and money. The sequential procedures are as follows:

1. Personal interview.
2. Application form.
3. Intelligence tests.
4. Personality inventories tests.
5. Knowledge tests.
6. Agility and strength tests.
7. Polygraph examinations.
8. Medical examination.
9. Character investigation.
10. Medical laboratory tests.
11. Probation period.

Holmes discussed his proposed program and noted in his conclusions that his proposal is theoretical and that each police department would have to judge how adequately a selection method works for them. Holmes also emphasized that the testing portion of the selection process should be conducted only by professional psychologists and psychiatrists and not by untrained personnel in whose hands they would "not only be useless but positively harmful." Holmes concluded by recommending that careful study be utilized in police departments to determine

the qualities of successful police officers and then developing tests which assess these qualities.

Holmes' work stimulated further research into the scientific investigation of selecting police applicants. However, these studies did not flourish until the late forties and early fifties when Dubois and Watson (1950) published their study on the selection of patrolmen. This study marked the beginning of more modern psychological assessment of police applicants.

Psychological Assessment of Police Applicants

The formal investigation of the psychological assessment of police applicants seems to have had its inception in 1917 when Terman published "A trial of mental and pedagogical tests to a civil service examination for policemen and firemen." He used the Stanford Revision of the Binet-Simon Intelligence Test to assess the intellectual capabilities of San Jose, California police applicants. Between 1917 and 1950, objective psychological assessment was primarily confined to intelligence and aptitude testing and psychiatric screening seems to have begun as early as 1933, when Vollmer (1933), wrote:

Attention is also given to the physical and temperamental qualities, and the character of applicants for positions on the force. Scientific laboratory tests are given to each candidate; a neurological examination follows, agility tests are used to debar the physically unfit, and finally, psychiatric technique is employed to disqualify temperamental misfits. These scientific selective processes positively eliminate at the recruiting period the individuals who are destined to fail later in one capacity or another (p. 163).

Although Vollmer's opinion seems optimistically confident, later studies would seem to dispute his statement that scientific selective processes positively eliminate those destined to fail.

In 1942, Holmes proposed his sequential selection procedures which included recommending the administering of personality inventories and constructing tests to evaluate police applicants. However, it was not until 1950

that published studies attempted to accomplish Holmes's recommendation of constructing tests to assess and select successful police officers. In 1947, an extensive reorganization of the St. Louis, Missouri police department occurred that resulted in the establishment of a police academy for recruits and the introduction of psychological techniques for selecting police personnel. Dubois and Watson (1950) were invited to participate in the selection of classes of probationary patrolmen. They utilized an extensive battery of intelligence, aptitude and achievement tests endeavoring to predict those who would prove to be successful in the academy and later on the job. Of the 1255 applications, only 512 met the educational, age, height, weight, residence, citizenship and satisfactory character reference Board requirements. The 512 were canvassed and 312 were still interested. Of the 312 invited to take the selection tests, 253 appeared. Examination cut scores, physical exams, and the screening board eliminated 114, leaving 139 for the police academy. Of these, 129 graduated and constituted the sample.

The selection test battery consisted of: The St. Louis Police Aptitude Test; Army General Classification Test (AGCT), First Civilian Edition; a short hand written essay on "Why I Wish to Become a Policeman" graded for handwriting and coherent English expression; and the Cornell Word Form-2, a controlled association test used to detect neurotic tendencies. During the academy training, additional tests were administered for experimental purposes: the Figure Matching Test; Bennett Mechanical Comprehension Test, Form BB; Minnesota Paper Form Board MB; the Object Aperature Test; the Strong Vocational Interest Blank; and the Rosenwig Picture Frustration Study.

Four validity criteria were used in the study: Final police academy grade, an achievement test score based on Perkins' "Elements of Police Science," marksmanship, and service rating after 10 weeks on duty. Utilizing a regression

equation, correlations and Beta weights were computed between the validities and the predictor variables. The Police Aptitude Test and the AGCT were both consistent predictors of academic performance and achievement test scores with a multiple correlation validity coefficient of .58 and .59 respectively.

Marksanship was best predicted by three non-verbal aptitude tests which yielded a multiple correlation of .33.

Dubois and Watson found the service rating to predict least accurately a policeman's performance. They concluded that service rating depended to a considerable degree upon personality predictors and thusly tests that predict service rating more adequately needed to be constructed. Their research was very significant to the police selection field because it was the first to use objective criteria, a significant sample size, and a more powerful statistical technique.

Kates (1950) posited that an individual with certain personality traits may be attracted to and satisfied with an occupation because his personality traits are compatible with the occupation's demands. Based on the premise that when personality tendencies are compatible with a sub-culture's demands, little self-dissatisfaction is induced. Kates attempted to ascertain the personality traits possessed by policemen. He also attempted to substantiate Strong's hypothesis that a significant relationship exists between measured vocational interest and job satisfaction. Kates administered a group Rorschach, a Hoppock type job satisfaction blank, and the Strong Vocational Interest Blank (SVIB) to 25 volunteer New York City policemen. He found no significant relationship between a policeman's measured occupational interests and job satisfaction, concluding that the SVIB can not be used with any degree of confidence in predicting satisfaction with police work.

However, significant results were found between the degree of job satisfaction and degree of maladjustment. Policemen's job satisfaction was significantly greater than routine office clerks and policemen were not more maladapted than routine office clerks or biologists. Interestingly enough though, Kates found that the more maladjusted policemen, as measured by the Rorschach Test using the Munroe Inspection Technique, tended to be more satisfied with their work than the less maladjusted. Kates concluded that the individual's maladjustment might contribute to his job satisfaction rather than dissatisfaction. This conclusion suggests the possibility that police work attracts persons with personality maladjustments. Clearly, Kates' findings presented the importance of personality adjustment in policemen.

Humm and Humm (1950) presented their analysis of the Humm-Wadsworth Temperament Scale administered to Los Angeles police officers between 1943 and 1949. Specially trained personnel administered, scored and made a probable success prediction based on the total profile. Success was based on voluntary or involuntary employment termination and on job performance. Although they reported an agreement in 91.3 percent of the cases of the war emergency appointee group between prediction and success status, the authors did not report which profile factors were used to predict success or which personality characteristics were found.

Five years later, the Baltimore City Service Commission evaluated the techniques employed to select patrolmen for the City Police Department (Mullineaux, 1955). They attempted to examine the relationship between success in the examining situation and factors such as sex and age. They also examined the relationship between success in the examination and success on the job as indicated by training school achievement and supervisor's evaluations of their performance.

The examination consisted of the Army General Classification Test, First Civilian Edition and a personal interview conducted by a three-man board. Each part had a maximum of 50 possible points. The Probst Personal Fitness Report was utilized as the standardized rating sheet with a possible score of 100 and a group mean of 86.23. The criteria for passing was such that an applicant could fail either part of the examination and still pass, provided his total score was 70 percent of the possible 100 points. Those who passed were required to meet height and weight specifications and to pass a rigid medical examination. A rank ordered list was established and 50 of the original 322 applicants were selected as Probationary Patrolmen who attended the Baltimore Police Academy.

The patrolmen's averaged scores on spelling, report writing, final training and final examination averages involving academic subjects were correlated with their AGCT scores using the Pearson r . The respective correlations were: .56 between AGCT and spelling; .60 between AGCT and report writing; .66 between AGCT and final training score and .73 between AGCT and final academic exam scores.

Forty-seven patrolmen completed the police academy and were rated at the end of 3 months and 6 months by the same Captains. The rating categories were: "Unsuited for this work, Might be adequate, Should be satisfactory, Endorsed with confidence, and Endorsed with enthusiasm." No applicants were rated in the first two categories on the three-month ratings. On the six-month ratings, no one was rated unsuited and only one was rated might be adequate.

The City Service Commission recommended: Retention of the Army AGCT as the test measuring learning ability; Inclusion of a spelling and penmanship test; Continuation of the personal interview since it seemed to tap "an area not included in the AGCT;" Revision of the rating scale, since above average ratings seemed unusually high; and further study on report writing. As Gottesman (1975)

indicated, it is likely that the three-man board interview was assessing personality factors although they did not state it as such.

In the same year, Frost (1955) surveyed thirty-three police departments nationwide with a three-page questionnaire in order to establish a composite of procedures and suggest a uniform method of selecting police recruits. Frost found their procedures to be very similar and grouped them into five requirement areas: Mental, physical, residency, character and age. In discussing the five areas, Frost focused on mental requirements from an educational viewpoint and reported no intelligence or personality assessments. In discussing character requirements, Frost stated that:

Intelligence, honesty, courage, good nature and emotional stability are all essentials of a good policeman but are not determined from letters of recommendation, a doctor's examination or the ability to read the rule book. The one recourse which is available to all departments is the character investigation (p. 143).

However, the character investigation consists of community inquiry by police personnel, oral interview by police board and checking local and federal arrest records. Of the 33 cities surveyed, no psychological tests are reported as being administered, thus routine objective psychological evaluation of personality had not been established as a major factor as late as 1955.

Dudycha (1955) reviewed traditional evaluation methods and proposed a rating scale based on the dimension of personality which included: initiative; practical judgement; ability to learn and follow directions; social sense; cooperation; attitude toward work and others; emotional control; and dependability and accuracy.

Dudycha discussed both intelligence and personality testing for police applicants concluding that the establishment of minimum intelligence requirements as measured by standardized tests required further study and that selection on the factor of intelligence alone was insufficient. He reported that it

was imperative that those predisposed to mental abnormality, emotionally unstable or psychotic be rejected early during the selection process. He recommended the use of a psychiatric examination where possible and a more practical personality testing when the applicants are many and the psychiatric exam impractical.

Dudycha considered the use of the Rorschach but thought that more data were needed in order to make generalizations and that the need for a highly trained clinician to administer, score and interpret the Rorschach precluded its usefulness as a screening instrument. He recommended the use of personality questionnaires interpreted by competent persons and listed the Cornell Index, Bell Adjustment Inventory, Bernreuter Personality Inventory and Thurstone Temperament Schedule for use. Although the validity of these instruments seems questionable for police applicants, Dudycha's work appears to be a beginning point of using objective psychological techniques to improve the selection of police applicants by assessing personality characteristics.

Psychological Assessment of Police Applicants from 1957 to Present

From 1917 to 1957, psychological assessment of police applicants as a whole focused almost exclusively on intelligence and aptitude testing. Beginning in 1957, the literature reports the birth of formal objective psychological testing on a large scale with the publishing of Rankin's 1957 article on the psychiatric screening of police applicants. The precipitating event which stimulated the public's support for the psychological assessment of police applicants was the publicity of policemen's brutal aggressive behavior toward prisoners. Rankin described the procedures of the Los Angeles Police Department relative to the psychological assessment in June, 1953 of hired police academy cadets' personality characteristics. Rankin reasoned that since applicants attempt to present themselves as favorably as possible, evaluation devices were needed to

assess the applicant's basic personality structure and emotional attitudes. Realizing they needed to evaluate large numbers of applicants efficiently, they decided to administer the MMPI and Rorschach in groups. These results combined with a psychiatric interview and background investigation were used to decide upon the applicant's acceptability for police work.

Rankin reported the following procedural attrition rates from a population of 4,239 applicants in 1955. Of the total applicants, 2,250 failed the written examination, 697 failed the Physical Agility Test, 663 failed the oral board interview and 441 failed the medical evaluation. Of the remaining 188 applicants, 161 completed the psychological evaluation and 25 of those were rejected. Of the remaining 136 finalists, 119 enrolled in the police academy and 103 graduated.

Perhaps one of Rankin's most relevant contributions is his report on 760 applicants that he evaluated between June, 1953 and 1957. His psychiatric evaluation rejected 86, diagnosing 51 percent latently psychotic, 15 percent inadequate personality, 22 percent schizoid personality and 14 percent cyclothymic or paranoid personality. The significance of this is that all of these men had passed the accepted screening procedures of that time and would have been assigned to regular police duties had they not been psychiatrically and psychologically evaluated.

Rankin's article seems to be the first to report the ongoing use of objective psychological assessment of police applicants' personality structures, and of particular importance, he documented the continual routine use of the MMPI in police applicant screening. Although he reported no statistical data regarding the 760 MMPI profiles, he reported that Lie (L) and Correction (K) scores were typical and were interpreted as the need to present the most favorable impression possible. Rankin concluded that further research should be conducted with the MMPI and the Rorschach with emphasis on assessing bad policemen

whom he defined as emotionally disturbed individuals in the classification of personality disorders including the latent psychotic, the rebellious social malcontent and the partially fixated immature person who reacts poorly to stress.

Oglesby (1957) believed it essential that police officers be emotionally well balanced and that they be tested in order to select those best suited for the rigorous demands of police work. Oglesby was a personnel technician for the City of Pasadena, California who surveyed 111 cities with populations above 100,000. He asked the police chief if their department had a program that psychiatrically or psychologically evaluated police applicants. Although 26 of the 90 replies received indicated psychological or psychiatric police applicant assessment, Oglesby did a follow up of the 26 asking for additional information and considered 14 to have formalized programs. Ten cities employed a psychiatrist, two employed a psychologist and one employed a psychologist and psychiatrist. Six of the 14 cities utilized paper-pencil projective tests which were used as the basis for the interview that followed. In those cities not using a paper-pencil test, the interview was the only assessment technique utilized by the psychiatrist and Oglesby did not report the names of the paper-pencil tests. All 14 cities had the applicant interviewed by their psychologist or psychiatrist.

Oglesby gave the honor of sharing the oldest continuous psychiatric screening of police applicants to Wilmington and Toledo, Ohio who initiated their programs in 1938. Jacksonville, Florida followed in 1947, Berkeley, California in 1949, Oakland, California in 1950 and New Orleans, Louisiana in 1952. In 1953 Pasadena, California, Philadelphia, Pennsylvania, Milwaukee, Wisconsin and Cleveland, Ohio established psychological or psychiatric assessment programs. In 1954 Los Angeles, California and Providence, Rhode Island began followed by Omaha, Nebraska in 1955.

Oglesby concluded that although no scientific proof existed relative to the success of psychological assessment, screening the emotional makeup of police applicants improved the selection process. He recommended that a complete standard selection procedure contain six elements: Standard basic qualifications; written aptitude and intelligence tests; interview; medical exam; character investigation and evaluation of emotional stability.

In 1959, Rankin published a review of his previous six years work of police applicant psychiatric screening. He reported that the psychiatric screening of police applicants could be considered not only preventive psychiatry but also an assistance in fostering more healthy attitudes in the general public toward police. Support for this was provided in his reporting that 11% of the 2,000 applicants he had evaluated were rejected as emotionally or mentally unfit. Rankin concluded that psychiatric screening can point out deficiencies and questionable attitudes in the otherwise acceptable applicant.

Chenoweth (1961) offered what he termed a new attempt of assessing police candidates in the form of situational tests. Chenoweth posited that psychological evaluators were trying to predict an individual's future behavior and discover the differences between his various characteristics. He stated that the police profession was more interested with the effective selection of recruits than the causative factors that result in rejection. He divided psychological tests into the two general categories of those which measure maximum performance and those that measure typical performance. He acknowledged that police departments need to know not only what an individual is capable of doing but also what the person actually does in typical day to day situations. Therefore, he supported the use of situational tests or behavioral observations of applicants exposed to carefully constructed situations, theorizing that the

applicant's reactions to the situation produces behavior that may be predictive of his behavior to comparable situations in the future.

Chenoweth (1961) cited the Office of Strategic Services for examples of situational tests used on applicants and wrote:

In the 'Ball and Spiral' test, six candidates were asked to maneuver a large cone in such a fashion that a ball would roll up a spiral ramp circling the cone until it reached a shallow platform at the top of the cone. The candidates were told that it was a test of physical coordination as well as group cooperation. Individual performances were ostensibly graded by penalizing a candidate who allowed the ball to drop off the ramp on his side. Group performance was ostensibly scored on the basis of the time it took the group to complete the task.

Because of its apparent simplicity, the task was an extremely frustrating one. The cone had been carefully constructed so that it was exceedingly difficult to keep the ball on the spiral ramp. In trying to keep his own penalties minimal while at the same time he improved the group score, each candidate found himself working toward two mutually incompatible goals. The resulting frustration and irritation revealed many subtle personality qualities. No less revealing were the hidden observations during the period immediately after the test when - with the release in tension - each candidate reacted in accordance with his dominant personality drives. Sheepishness, perseverance, self-assurance, disgust, disdain, aloofness, wrath, frustration, disappointment - all of these emotions found an outlet that was useful to the observer (p. 235).

Chenoweth proposed that situational tests be included as part of the assessment program and may be preferable for those agencies who cannot afford the psychological services to administer, score, and interpret projective tests. Also, he indicated that situational tests did not rely on the candidates self-reported attitudes, beliefs, and behaviors as do self-report instruments. He also noted that in order for situational tests to be effective, their validity, like other tests, would rely on the knowledge of what qualities, characteristics, or attributes are necessary for a policeman to possess. He listed the following as necessary ingredients of a good police officer: Energy and initiative, effective intelligence, emotional stability, social relationships, leadership, security, physical ability, observing and relating, and certain propaganda skills. Chenoweth

concluded by recommending the creation of situational testing procedures designed specifically for assessment of applicants to do police work.

Chenoweth's work certainly clarifies the emphasis of most police departments today, namely the focus on selecting applicants who will prove to be successful in the police officer role.

Marsh (1962) conducted a joint research project between the Sheriff's Department and the Los Angeles County Civil Service Commission to detect those clues in the selection process that could be used as predictors of a law enforcement deputy's later job performance success or failure. He assessed the predictive validity of civil service written test scores, interview scores, personality and interest tests, personal and biographical data, and grades earned at the Sheriff's Recruit Training Center.

The subjects consisted of 619 men appointed deputy sheriffs as a result of four civil service examinations administered between 1947 and 1950. The civil service test scores included general ability, sentence completion, arithmetic reasoning, cubes and block-counting, practical judgment, memory, and interview scores. No details were given relative to the interview scores.

Personality and interest tests were administered to approximately 100 of the men in connection with counseling services they were receiving at the Veteran's Service Center at the University of Southern California. The tests were conducted after the men were hired and they were informed that the test scores were to be used only for counseling. Therefore, the tendency to fabricate a desirable profile was reduced. The tests were the Guilford-Martin Temperament Inventory, the Kuder Preference Record and the MMPI. Personal and biographical data were collected and included years of school completed and major subject, previous occupations, age at entry and height.

The criteria used to evaluate success included job performance ratings, discharge rates, accident rates and job tenure. Multiple raters were secured by contacting as many persons as possible who had supervised and observed the policemen's performance. Ninety-three raters were interviewed and 1,694 ratings obtained. One or more ratings were obtained for 547 of the 619 deputy sheriffs. The number of subjects per rater ranged from 5 to 109 and the number of ratings per person ranged from one to as high as seven. Ratings for subjects with fewer than two were not used, resulting in a total of 1,532 ratings with a mean of 3.47 on a 5-point scale.

Eight years later (1958), 350 or 59% of the original 591 were still employed and 40 of the 591 had been terminated or resigned to avoid being terminated. The accident rate was obtained by examining the automotive accident record of each deputy. The records showed that 153 men had been charged with at least one preventable accident and were identified as the "High" accident group. A non-accident group of 184 was drawn from the Patrol Division and identified as the "Low" group.

Several predictors were found to effectively differentiate between High subjects and discharges or between High and Low subjects. The chi-square test of significance was utilized and only results significant at the .05 level or less were reported. Those subjects whose written test scores were above the 97th percentile of the original distribution of unselected subjects' scores were more apt to be successful. The ratio of Highs to discharges was 12½ to 1 compared to a ratio of 2½ to 1 for the Lows. Two of the written subtests were found to be significant predictors of success: Sentence completion at the 84th percentile and number series completion at the 73rd percentile.

While no significant results were found with the Kuder Preference Record (KPR), Marsh reported the Hypomania (Ma) and Hypochondriasis (Hs) MMPI

scales to show exceptional promise as predictors of performance. Subjects with T-scores below 55 were much more likely to succeed. Subjects with C scores below 6 on the General Activity scale of the Guilford-Martin Temperament Scale also tended to be successful. Additionally, subjects 72 inches in height and taller were much more apt to be successful, using the "High" versus discharge criterion, and those with grades of 80% or better were virtually assured of success.

While no significant relationships were found between accidents and civil service test scores or personal data, a higher accident rate was significantly associated with T-scores of 55 or higher on the MMPI Hypomania (Ma) scale, T-scores below 50 on the MMPI Depression (d) scale, T-scores below 30 on the KPR Mechanical scale, and T-scores of 50 or higher on the KPR Social Service Scale.

Marsh (1962) presented no tables of statistical results on any of the sample, and the personality and interest scores of the 100 deputies were reported. Considering that he was working with instruments possessing several inter-related scales, and attempting to predict group membership, a more powerful statistical procedure such as multiple regression, discriminant analysis or Multivariate Analysis of Variance (MANOVA) might have been more appropriate. Additionally, the possible utility of the MMPI findings for prediction was confounded since only 100 of the subjects took the test and it is unknown how many of the 100 were assigned to each of the High and Low groups. The Marsh study marked the beginning of those to use the MMPI to predict those who would later prove to be unacceptable.

Eleven years later, Azen, Snibbe and Montgomery (1973) conducted a longitudinal follow-up of the Marsh project. They randomly selected 95 members of the Deputy Sheriff's Academy Classes of 1947-1950. They used the same prediction variables that Marsh found but they established different success

criteria. Six discrete categories of success were established to define success of deputies either terminated or on the job from 1950 to 1970: (1) Employment status (employed or not); (2) Rank status (promoted or not); (3) Job type (patrol or other); (4) Average of all supervisor's ratings (High or Low); (5) Job related automobile accidents prior to 1958 (none or at least one); and (6) Job related automobile accidents prior to 1970 (none or at least one).

Several predictors continued to be significant over the 20-year span. Using a one-way analysis of variance (ANOVA) they selected a significant predictor with largest F value as the best predictor. They found the MMPI Hypomania (Ma) score to be directly related and the Depression (d) score to be inversely related to the prediction of auto accidents over both the first and second ten-year periods. Using a stepwise discriminant analysis, they found the Kuder Preference Record to be the most useful predictor since it predicted 3 of the 6 criteria. No source table was reported on the ANOVA nor the discriminant analysis, therefore, strength of association measures were unavailable. The authors noted the inherent problems of longitudinal studies involving tests in that test predictors are often revised and the resulting validity may produce questionable results. Nevertheless, the results seem rather remarkable and the Azen et al. study recommended continual and rigorous selection research.

Narroll and Levitt (1963) surveyed 61 cities with populations of 150,000 or more in an attempt to estimate the extent that formal psychological and psychiatric techniques were being utilized in the selection of police applicants. They reported the most popular tests to be specially constructed nonstandardized policeman selection tests (87%) followed by standardized group IQ tests (40%). Only twelve of the cities reported using any personality tests leading the authors to conclude that little was being done on a nationwide basis to objectively evaluate police applicants' personalities. They also concluded that little or no

research was being conducted on police selection techniques and that few psychologists were involved in evaluating police applicants or researching selection procedures.

However, shortly following Narroll and Levitt's findings, several studies were published relative to more scientific evaluation of police applicants and involvement by psychologists. Matazzaro et al. (1964) assessed 243 successful policemen and firemen applicants with an extensive battery of tests in order to provide descriptive personal and psychological characteristics of successful policemen and firemen applicants. Of the 243, 116 were policemen and 127 were firemen on the eligibility hiring lists during 1959-1961. Matarazzo et al. administered the Wechsler Adult Intelligence Scale (WAIS), Rorschach, Miale-Holsopple Sentence Completion, Taylor Manifest Anxiety Scale (TMAS), Saslow Psychosomatic Inventory, Cornell Medical Index, California F Scale, Adorno Authoritarian F Scale, Strong Vocational Interest Blank (SVIB), and the Edwards Personal Preference Schedule (EPPS). From 1961 on, the MMPI (N=84) was substituted for the EPPS.

After the individually administered eight-hour clinical-psychological assessment, each applicant was rated by the clinician as "pass" or "fail." The clinicians passed 65 (56%) of the 116 previously successful police applicants and 72 (57%) of the 127 previously successful firemen applicants. The researchers reported that almost without exception, the failed individuals were so designated because of emotional instability, immaturity, psychopathic personality, psychosis or other negative test battery indicators such as bizarre Rorschach responses, unusually high anxiety scores and "clinically fragile" MMPI profiles. The researchers reported that only with further research would they be satisfied they had demonstrated acceptable validity correlates for their up-to-now clinical method of selecting pass or fail applicants.

Matarazzo et al.'s results regarding the 116 police applicants are rather interesting: Mean Age, 25.7 years; Mean educational level, 12.6 years; Mean WAIS Full Scale IQ, 112.9; Taylor Manifest Anxiety Scale, 6.0; Saslow Screening Inventory, 2.8; and 5.4 on the Cornell Medical Index. The Edwards Personal Preference Schedule data was reported on a profile graph for both 93 firemen and 79 policemen but no standard deviations or confidence levels of significant differences between groups were reported. On the SVIB, policemen's interests, compared to firemen's, were more like those of persons employed in the social service occupations. Rorschach results were not reported other than to state that the 116 policemen and 127 firemen did not differ on any Rorschach variable.

Matarazzo et al. reported the mean MMPI profiles for 35 policemen and 49 firemen. They noted the profiles to be similar but free from serious psychopathology as a group. They interpreted the elevated Correction (K) scale as being a function of the previous stringent medical selection process or "more likely, an understandable cautiousness" in the job-selection process. They analyzed the profile as follows:

In terms of profile analysis, the elevations on Pd, Hy (43-code), and low Si (low 10) profile shown by both groups of applicants indicates that they are typical of the enlisted men one often encounters in the military services: blustery, sociable, exhibitionistic, active, manipulating others to gain their own ends, opportunistic, unable to delay gratification, impulsive, and showing some tendencies toward overindulgence in sex and drinking (Dahlstrom & Welsh, 1960). In a word, fitting the lower socioeconomic group's stereotype of the 'man's man' (p. 131).

Although no inferential statistics were reported, the foregoing MMPI interpretation was the first discovered in the literature and this study's broad scope of considered characteristics and MMPI findings seems to mark the beginning of established psychological assessment of urban police applicants. Also, this interpretation was extremely interesting considering that impulsive policemen were carrying weapons and dealing with the public. This generated a

great deal of interest in behavioral researchers and especially those involved with screening and selecting police applicants. Although many studies were conducted on police applicant screening and selection following the Matarazzo et al. study, the most frequently used objective instrument, and the focus of this study, was the MMPI. Therefore, the remainder of the literature review will focus primarily on the use of the MMPI in police applicant selection.

Use of the MMPI in Police Applicant Selection

Marsh's (1962) MMPI findings appear to be the first recorded study on police applicant selection utilizing the MMPI as one of the instruments. He reported that police applicants scoring below T-score 55 on the Hypomania (Ma) and Hypochondriasis (Hs) scale were more likely to perform successfully on the job and that a significant relationship was found between automobile accidents and those who had T-scores of 55 or higher on Hypomania and T-scores below 50 on the Depression (D) scale.

In an effort to improve police applicant personnel selection, two staff psychologists, Colarelli and Siegel (1964), conducted a joint study between the Kansas State Highway Patrol and the Topeka State Hospital Psychology Department. Their study was designed to articulate, in a systematic fashion, the Patrol's experience in selecting desirable applicants. This was stimulated because they felt that their test procedures were accepting undesirables and rejecting desirables. The researchers reported that the then recent advances in test construction and methodology within psychology had made it possible to glean more of the department's experience about what makes desirable applicants and would enable them to make predictions about incoming applicants' future performance.

Using the California Test of Mental Maturity, the Allport-Vernon Study of Values, the Edwards Personality Preference Schedule, and the MMPI, they tested

all patrol members and developed performance ratings. The supervisor's ratings in combination with eight other variables were used to classify each man as either desirable or undesirable. The eight variables were: Moving hazardous arrests, moving hazardous warnings, other arrests, services rendered, light correction, miles per contact without radar, miles per contact, and hours per arrest. Although the authors reported submitting the two sets of desirable and undesirable data to an IBM data processor to analyze the relationship between the test scores and the job performance ratings, the type of statistical analysis (ie. discriminant analysis, multiple regression, etc.) was not given nor was data presented regarding the number of men in the desirable and undesirable categories nor significance levels identified. The following is a summary of their findings.

After establishing their descriptive criteria of desirable and undesirable criteria, the researchers tested their results on four groups of applicants hired by the Patrol. Approximately 60 men were administered the same battery and performance predictors made for each. Even though some were predicted to be poor they were hired so that predictions could be evaluated. The results are remarkable in that no substantial disagreement between the psychological test prediction and the supervisor's judgment as to the field performance occurred in 90% of the cases. With one exception, every man predicted to be a poor patrolman was either terminated or rated by his supervisors as poor or marginal in his job performance. Likewise, those predicted to be above average or excellent generally proved to be so. Only for the man predicted to perform average did the predictions work least well. Colarelli and Siegel concluded the patrol's experience indicated that the application of scientific principles of psychological assessment and prediction to select applicants resulted in improved selection.

During the same year the previously discussed Matarazzo et al. (1964) published their results, Blum (1964) authored and edited a book on police selection. In Chapter V, Blum reported a high percentage of men with negative background indicators. Twenty-five percent (25%) had significant criminal records, 30% poor driving records, 30% moderate to severe personality problems, 20% defective judgment or intelligence and 30% with questionable motives. Although Blum accurately reports that a thorough background investigation and normal Civil Service procedures would reject many of these applicants, the importance of including the objective assessment of psychopathology seems clear.

Blum (1964) reported on four studies he was involved in, three of which utilized the MMPI. The first study was conducted in a suburban county sheriff's department with a population of about 500,000. Twenty-eight men were given the MMPI, Draw-a-Person, Strong Vocational Interest Blank (SVIB), and the California F Test after passing the physical agility and routine civil service screening test. Using the MMPI to diagnose potential character defects as measured by the Psychopathic deviate (Pd), Lie (L), and Masculinity-femininity (Mf) scales, they rated 8 of the 27 as having some character defect. Comparing the MMPI results to personal and background information, 7 of the 8 evidenced past undesirable behavior. Interestingly enough though, the man with the highest MMPI Pd score had no derogatory information in his file. Checking supplemental information for evidence of dishonesty, 9 of the 27 had past misconduct and 5 of the 9 had high Pd scores, 1 high Mf score and 3 had no MMPI signs of character defect. Blum concluded that the MMPI performed relatively well, producing only 12% false positives and 33% false negatives.

A second study was conducted in the same sheriff's department the following year with a group of 41 men who took the civil service test but scores

were not used to fail them. Nor were personal or background information used to fail them prior to their oral board interview. All passes and fails were determined by the oral board on the basis of all personal, background, and psychological results plus the board's direct evaluation of the applicants. When the MMPI results were compared to the findings of the previous study, it did not predict as well. Using the background check as a criterion variable, the false positive rate was 33% and the false negative rate 50%. Blum cautioned researchers regarding generalizing from small sample studies. Regarding these two studies, Blum concluded that when background investigation, psychological evaluation and psychiatric interviews are available to the oral board for review, the selection process is considerably improved.

Blum's major study was a seven-year follow-up of 87 policemen who applied and were hired by a major metropolitan police force. They were given the MMPI, group Rorschach, Strong Vocational Interest Blank (SVIB), Draw-a-Person, California F test, and the Otis Intelligence Test. The tests were not used in any way for selecting the applicants. They were hired based on a medical and agility exam, an unstandardized civil service test and an oral interview. After the tests were given, the results were filed and were unavailable to any supervisors.

After scoring the tests, Blum blindly predicted the men's future performance based only on the test results with no personal contact nor knowledge of the applicant's background. He rated an applicant as either satisfactory, questionable or probably disciplinary or efficiency problem.

Blum (1964) concluded that some relationships existed between psychological characteristics measured at the time of hiring and later work performance. Of 324 correlations, 36 were reported at the .20 level or higher. Three of the 36 were .40 or higher, which is significant when considering that .40 accounts for 20% of the variability. In the behavioral sciences, any variability of

.10 or larger is considered significant (Hasse, Waechter & Solomon, 1982). The MMPI and the SVIB had the most valuable correlations with the MMPI having the 3 highest. The MMPI had correlations of .47, .42, and .40 respectively with schizophrenia personality trends, bizarre and unusual responses to questions and obsessive-compulsive personality traits relative to exceptionally serious misconduct. Furthermore, Blum's predictions of poor performance relative to exceptionally serious misconduct had the next highest correlation of .38, accounting for 14% of the variability which is now considered a significant finding (Hasse, Waechter & Solomon, 1982). Blum concluded that personality problems are the greatest factor in predicting later misconduct as a policeman. It is unfortunate that no means or standard deviations were recorded.

Although Johnson (1965) did not study the MMPI, he reported on the progress made in the selection of qualified policemen via psychological tests. He compared the Matarazzo study with the 1917 Terman study reporting that a very important difference between the two time periods had been the introduction of standardized personality assessment procedures. He also reported the most striking difference to be the intellectual ability of the eligible applicants. Terman's eligibles had an IQ in the "dull normal" range and Matarazzo's obtained an IQ score in the bright normal range. Johnson concluded that considerable improvement had been made in the selection of acceptable policemen and firemen applicants.

Nowicki (1966) used the MMPI to study the personality traits of 27 police officers from 3 suburban police forces. He compared the 27 with a group of 27 white collar industrial workers matched for sex, age and education. Using the t-test, the police officer T-scores on the MMPI standard scales and on special scales were compared with the industrial group. No significant differences were found on the standard scales. Nevertheless, several scales were elevated more

than one standard deviation above the mean of the MMPI general norm group. Nowicki interpreted the police officers profile as those who are a bit defensive in the test-taking situation, but are adjusted, frank, open-minded, not prone to worry, vigorously, optimistic and willing to meet reality head-on.

These results are worth noting but the small n and the fact that they were suburban departments precludes any generalizability. Additionally, the police officers were already hired, therefore, they didn't take the MMPI under the same conditions as police applicants.

Levy (1967) attempted to discover whether recorded pre-appointment factors could significantly discriminate between policemen who left the force because of occupational inadequacies including personal behaviors intolerable to their employers and those who were considered adequate or successful. She noted that although usual practices was to exclude those applicants with excessive anxiety, rigidity, low intelligence, poor credit ratings, criminal records, sadistic tendencies, alcoholism, dishonesty, homosexuality or behavioral manifestations of impulsivity, common reasons for terminating police officer's careers was drunkenness, extramarital sexual activity, and indebtedness.

Since these behaviors were not present at the time of employment, Levy hypothesized that the personality characteristics of unsuccessful law enforcement officers as revealed by their personnel files would show significant differences from the personality characteristics of non-failure. Further, that certain life historical events would significantly discriminate between the two groups. She termed the unsuccessfuls as failures and recommended that future research investigate those who would later prove to be failures.

Three psychiatrists and one psychologist, Rhead, Trosman, Margolis and Abrams (1968), described their assessment of procedures of police applicants using objective and projective tests including a clinical type interview. They

were requested by the Chicago Civil Service Commission between 1961 - 1963 to examine the psychological suitability of those applying for law enforcement careers. They evaluated over 1,000 applicants who had previously passed the civil service exam, physical and background investigation of moral habits, character and past history. The applicants were then administered the MMPI and a variation of the Draw-A-Person test. Those with a extreme MMPI profiles and marked disturbance in the projection of body image were recalled for further testing with the Rorschach, TAT, Wechsler-Bellevue and others as indicated. The psychologist selected applicants from this group with questionable results to appear before an advisory board of two psychiatrists and a psychologist who conducted a clinical interview. The board was not limited to the detection of psychological illness but also attempted to evaluate whether or not the applicants were psychologically suited to the stresses imposed on them by police work.

Regarding the MMPI results, after the results were tabulated on over 1,000 applicants, significant differences from MMPI normals were noted to regularly occur even in those men considered successful. They reported that the applicants' group profile significantly exceeded the average on Pd and Ma in 70% of the cases, scales associated with a willingness to take chances and a propensity for acting out their impulses. They also reported a sharp but less pronounced deviation from the MMPI normals on Pa in 80% of the cases. The authors related that although the impression seemed to be one of a person who is more suspicious and prone to take risks and act on his impulses, the MMPI alone did not differentiate the normal from the pathological individual. Further, that what appeared to be excessive in the normal population may well be in the service of the ego in a cross-section of police applicants.

The board recommended rejecting 30 percent of the applicants. Of those, 20 percent evidenced grossly incapacitating illness. The authors acknowledged that their report lacked the solidity of a carefully controlled study but recommended that projective techniques be supplemented by an interview and concluded that success or failure in law enforcement is strongly influenced by the degree to which the adaptive ego has remained undistorted in response to unconscious conflicts. No MMPI scale score means or standard deviations were reported nor profiles graphed.

The next recorded MMPI law enforcement research was conducted by Hooke and Krauss (1971). They administered the MMPI, Allport-Vernon Study of Values and the Gough Adjective Check List to 37 volunteer Kansas City police officers who had passed the written aptitude and oral examination and were eligible for promotion to sergeant. Their participation was "for the good of the department" and they knew that the department had no access to the data and, therefore, had no bearing on their possible promotion.

Each sergeant candidate was anonymously rated by every current sergeant on a scale of 1 (very poor) to 10 (excellent) on two questions: (1) How good a policeman is this man? (2) How good a sergeant do you think he will be? The unsuccessful sergeant candidates were uniformly unwilling to cooperate, apparently due to being rated. However, most of the force had previously completed the MMPI and, matched for age and service length, a group of unsuccessful sergeant candidates was drawn from the MMPI pool and compared with the successfuls.

Although the mean MMPI profiles of both groups peaked on the Pd and Ma scales, no scale scores were greater than one standard deviation above the general population mean leading the authors to report that both groups were normal, exhibiting high energy and little neurotic inhibition. However,

statistically significant differences occurred on 3 scales. The successful candidates were higher on scales Correction (K) and Pa and lower on social-introversion than the unsuccessful candidates with whom they were matched. The authors interpreted this as a tendency of the successful candidates to be more self-reliant, self-confident, more sensitive in interpersonal relationships and more outgoing and genial than their counterparts.

Of the 37 successful candidates, the 13 highest rated and 13 lowest rated were divided into two groups and their MMPI and Study of Value scores compared. Although no statistically significant differences emerged, the authors noted that of the 13 high-rated officers, one had one scale above T-score 70, while 3 of the low-rated officers had one scale above T-score 70 and another had more than two scales in the abnormal range.

Murphy (1972) conducted a survey of 258 local police agencies and 49 state police agencies who had more than 100 men and served populations of 50,000 or greater. He attempted to determine the extent police agencies in the United States utilized psychological tests in the selection of police officers. He received 173 replies from local agencies and 30 from state police agencies. His results showed that 43.93% of the 176 local agencies used tests and of the 30 state agencies that replied, only 4 or 13.33% used tests. Out of 203 total respondents, only 80 or 39.41% use psychological testing to evaluate potential law enforcement officers. Murphy found that the MMPI was the most frequently used psychological instrument. Thirty-nine or 48.75% of the using agencies utilized the MMPI and 33 or 41.25% used the psychiatric interview.

In 1973, Azen, Snibbe and Montgomery conducted their follow-up longitudinal predictive study of successful performance of law enforcement officers previously discussed in this chapter. Of relevance to this study is their ANOVA findings that the MMPI Hs scale was a significant predictor of rank

status and that MMPI scales Ma, directly, and D inversely were significantly related to automobile accidents over the first and second 10-year periods.

Sacuzzo, Higgins, and Lewandowski (1974) compared a random sample of 104 metropolitan and 92 non-metropolitan police applicants in the state of Tennessee using the MMPI, the Otis Lennon Mental Ability Test-Form J, and the Kuder Preference Test-Vocational, Form CH. The mean profiles for each group individually, as well as the profiles for the groups combined, were calculated. However, the authors were unclear as to whether or not the accepted and rejected applicants' scores were combined for the reported profiles.

The authors' purpose was to describe the average metropolitan and non-metropolitan police candidate in the state of Tennessee. They graphed the MMPI K-corrected profile for the two samples combined and reported that the profiles of the individual groups strongly resembled the combined group and that the MMPI patterns were relatively flat with none of the scales being above a T-score of 60. The highest mean validity scale in both samples was the K scale interpreted as a need to "fake good" or be seen in a favorable light. The highest clinical scale score for the individual and combined samples was Pd, and the high three-point code for the combined and individual samples was 439. The authors concluded that the profile types most likely to exceed normal limits in their police sample was the 439 code type and that if psychopathology is present in police officers it would most commonly be manifested as a character disorder as described by the 4-9 or 4-3 profile. The reported that there had been no published research on the behaviors correlated with the 4-9 pattern in police officers.

Gottesman (1975) conducted a study in which he attempted to describe the characteristics of men who applied to an urban, northern New Jersey police department using the MMPI. He compared the mean MMPI profile of 203 urban

North Jersey police applicants with the mean profile of a group of Cincinnati police applicants and with the mean MMPI profile of a control group of 100 veterans demographically similar to the North Jersey group. He found that the applicants had significant, though not pathological, elevations on scales K, Hy, Pd and Ma. Accepted and rejected applicants were combined. He noted the existence of a "fake desirable" response set among all applicants. He also commented that the MMPI appeared to have continuing validity in the identification of serious pathology among applicants. He argued that the MMPI norm group was not a suitable control group against which to interpret the responses of police applicants. He proposed the development of a new set of norms based on the responses of urban police applicants nationwide.

In order to examine the utility of the MMPI as a tool in differentiating among police applicants and in predicting success and failure, Saxe and Reiser (1976) conducted a study in which they compared three groups of applicants to the Los Angeles Police Department (LAPD) using the MMPI. The three groups included: (a) 100 men randomly chosen from 370 who failed the psychiatric evaluation; (b) 100 police officers randomly chosen from 500 men who were appointed and were still with the police department; and (c) 100 men randomly chosen from a group of 480 men who were appointed to the department but separated within the next three years. All groups were compared to Gottesman's (1975) applicant group and the MMPI norm group. The total LAPD applicant group was found to be significantly different from that of the rejected group, as well as the attrition group on eight of 13 MMPI scales. The authors caution that although these differences are statistically significant, they are within the normal range and are too small to have utility in clinical differentiation between successful and unsuccessful applicants. Nevertheless, they pointed out that the

statistically significant differences which do exist may reveal attributes which relate to success on the job.

Daley (1978) examined 1,000 randomly selected MMPI protocols from among 4,200 New York City appointees to determine the applicability of standardized MMPI norms to the police sample. Significant differences between the police and MMPI normals on all but one of the MMPI scales was observed. Daley concluded that the differences were not of such magnitude as to preclude the use of the MMPI as a screening instrument. Additionally, the study attempted to predict unsuitable job performance with certain demographic variables and MMPI scores. Results were significant but accounted for only 5% of the variance between groups.

However, statistically significant differences occurred on 3 scales. The successful candidates were higher on scales K and Pa and lower on Si than the unsuccessful candidates with whom they were matched. The author interpreted this as a tendency of the successful candidates to be more self-reliant, self-confident, more sensitive in interpersonal relationships and more outgoing and genial than their counterparts.

Mass (1979) examined the validity of the California Psychological Inventory, the MMPI and the Holland Vocational Preference Inventory as pre-employment screening instruments in law enforcement. He concluded that relative to MMPI scores, effectiveness in police work was not associated with significant adjustment problems or maladaptive reaction tendencies.

McMullen (1979) investigated social, demographic and personality factors which might contribute to overt indiscretion among urban police officers. Overt indiscretion was defined as behavior which violates the law and/or departmental regulations and were reported and recorded by the police department. The study included a quasi-experiential data analysis of 339 urban police officers' personnel

files and MMPI profiles administered at the time they applied for employment. The study's purposes was to assess whether the use of social demographics and personality characteristics could be used to identify police applicants who might engage in indiscreet behavior.

Results indicated that social demographic characteristics do not provide a reliable basis for predicting indiscreet behavior while personality characteristics can predict only a small percentage of the variance of indiscretion. McMullen (1979) concluded that personality characteristics that did predict indiscretion suggested two underlying factors: rigidity and poor self-image. The author concluded that better predictions of police applicants' likelihood of engaging in indiscreet acts may be derived from research utilizing a combination of personality and situational characteristics.

Levine (1979) reported that psychological testing of police applicants was being used by about 50% of all police departments in the United States and the MMPI was the single most frequently used psychological test. She investigated whether or not an MMPI subscale could be developed that had predictive validity in identifying police applicants at risk of failing after they became police officers.

Information was gathered on 230 male police officers from eight different San Francisco Bay area communities. They were hired between 1971-1978. MMPI profiles and personal background information was gathered at the time of routine screening by an independent psychologist. Follow-up data on the officers' performance was collected with a follow-up form.

Of the 230 MMPI protocols, 50 were considered failures and 180 non-failures. Failure was defined as those who were dismissed or forced to resign and those who received a "would not rehire" rating from the department chief. All others were considered non-failures. Eight MMPI items were found to

cross-validate and were combined into a scale called the Police Failure Prediction (PFP) scale.

The PFP scale, with a range of possible scores from 0 to 8, showed the strongest difference between failure and non-failure officers to be a score of 4. A score of 4 correctly identified slightly over one-third of all police applicants who eventually failed while misclassifying approximately 17% of the non-failures. Although the sample size was small, a score of 6 correctly identified 100% of those who failed.

The author reported the items which comprise the PFP scale seem to tap a dimension of mild chronic depression and that a high number of failure officers had a parent who died, suggesting a possible etiology. Levine suggested that applicants with a deceased parent and a high PFP scale score face a substantial risk of failure as a police officer and concluded that the PFP was faster, less expensive and a more accurate alternative to the MMPI for predicting police officer performance.

Schonfeld, Kobos and Phinney (1980) explored the interrater reliability of two experienced judges using the MMPI clinically in a simulated selected procedure. They used markedly different selection strategies and disagreed on nominal placement into two categories on about one-third of the cases. Neither judge was more accurate than the other and they did not improve on their overall individual performances when they collaborated. The MMPI protocols of 424 male San Antonio police officers were used. The protocols had not been used by the department in the selection process. The authors concluded that they had not adequately assessed the validity of the MMPI in predicting later poor performance because the study was not well controlled. They also concluded that to the extent that raters have different biases, reliability classification would be affected.

Merian, Stefan, Schonfeld and Kobos (1980) examined the validity of the MMPI in differentiating between acceptable and unacceptable police candidates. Using the same 424 male MMPI police applicant protocols, the study attempted to develop another index, possibly in conjunction with the Goldberg index. They conducted an item analysis and found 31 items which significantly differentiated the acceptable and unacceptable officers. Five of the 31 replicated. Of the 424 officers, only 23 were classified as unacceptable on the basis of supervisor ratings and corroborated by personnel file information. Since the sample size was so small and the alpha level set at .10, the results do not appear significant. The authors recommend that further replication trials be conducted in order to document generalizability.

Mills (1980/1981) attempted to validate the MMPI in predicting those police officers who would prove to be successful. She was primarily interested in whether the MMPI had the capacity to select the best qualified applicant rather than screen out the "few extreme undesirable candidates." She attempted to demonstrate that certain scales were predictive of success at four different levels: (1) acceptance into the academy, (2) graduation from the academy, (3) field retention; and (4) field performance.

The study was conducted in two phases. The first phase used t-tests to examine MMPI profiles collected on 1,844 applicants to the Los Angeles County Sheriff's Department from December, 1974 through March, 1979 to assess differences between successfuls and unsuccessfuls. Of the 1,844 profiles, 1,810 were used: 934 were employed and 876 were not. Although she reports 1,390 males and 454 females applied, she does not report how many of each were employed. Of the 1,810 profiles examined, those who were employed scored significantly higher on the Ma scale. However, none of the significant relationships had a strength of association that exceeded more than one-half of

one percent using omega squared. Of the 803 who graduated from the academy and the 125 who did not, the graduates scored significantly lower on the Mf scale. Of the 761 field successuls and 42 field non-successfuls, no scales yielded significant differences.

Phase 2 extracted a sample of 176 applicants from the original population who attended academy classes between March, 1975 and October, 1976 and who were then employed. Females comprised 25 and males 151 of the 176 academy graduates. Since her sample sizes were so low, the gender factor was not analyzed. Using a stepwise multiple regression on the 176 applicants to evaluate injuries on the job, absences, internal investigations and supervisory ratings, she found significant MMPI scale predictors but accounted for only 1% or so of the variance.

Although the MMPI significantly differentiated the successuls from the non-successfuls into employment, Mills (1980/1981) concluded the MMPI was not established as a valid tool for screening or selection since weak strength of association measures accounted for only minimal quantities of variance. However, this study is germane to this research since it was the first study found that began to include females in the analysis, although it was a low sample size.

Matyas (1980/1981) examined the relationship between MMPI and biographical variables used as criteria in the police selection process and acceptance versus rejection of an applicant; supervisory ratings of performance; and certain variables reflecting job performance. The subjects consisted of 189 male Elizabeth, New Jersey police applicants who applied between 1969 and 1978. Of the 189, 121 were accepted and 68 psychologically rejected.

Matyas (1980/1981) found that accepted and rejected applicants differed significantly on several selection variables. Rejects appeared generally less stable as characterized by significantly more jobs, arrests, court appearances as

dependents, traffic citations and disciplinary actions on the job, in the military and in school. Also, they move more often and tend to accumulate larger debts than accepted applicants. On the MMPI, the rejected groups scored significantly higher on *Mf*, *Sc* and *Ma*. Of the applicants, 60.3% of the rejected group versus 19.7% of the accepted group had T-scores of 65 or above on one or more of the clinical scales. Relative to the MMPI, he concluded that in general, elevations on the MMPI clinical scales appeared negatively related to job performance and that the MMPI appeared to be reasonably effective in identifying questionable applicants despite an attempts of most applicants to "fake good."

Ward (1981) investigated the relationship between biographical and personality characteristics of police recruits and measures of their performance at the training academy and on the job. A battery of psychological tests was administered at the beginning of academy training to 208 caucasian males, 56 minority males and 53 females enrolled at eight different Florida training academies. The battery included a 60-item Personal History Questionnaire, California Psychological Inventory (CPI), State-Trait Anxiety Inventory (STAI) and the MMPI Lie (L) scale. The officers were studied for two years with performance measures obtained at the completion of three critical employment periods: (1) completion of police academy; (2) completion of probationary employment; and (3) two years following the test battery administration.

A dichotomous success/failure criterion was developed for the two-year follow-up study. Successes were defined as officers who were employed at the end of the two-year period. Failures were defined as those who did not successfully complete the police academy and officers who terminated employment and were rated "not rehirable."

Different combinations of biographical and personality variables were found to predict performance of caucasian males, minority males and females

for each employment period. In general, the more effective females, caucasian males and minority males were more educated, sociable and intellectually efficient than those who performed poorly. Highly rated females and minority males were more achievement oriented, dominant and less anxious than their lower rated counterparts.

The results suggested that biographical and personality variables are useful in screening out potential unacceptable performers but that different prediction equations need to be used for females, caucasian males and minority males. While t-tests were used to analyze the differences between groups, the author reported no information relative to the MMPI L scale. Of particular interest, however, was his finding that successful females were not bothered by bragging co-workers.

Costello, Schonfeld and Kobos (1982) conducted an analogue study of 424 male policemen in an attempt to use an MMPI inspired index called the Goldberg Index ($L + Pa + Sc - Hy - Pt$) to differentiate between acceptables, intermediates and unacceptables. Their purpose was to establish a model description of the unacceptable police officer and their results are very remarkable in that the acceptable was differentiated from the unacceptable with a high level of confidence. Twenty-three of the 424 were rated as unacceptable and using a t-test they found that the unacceptable scored high ($t = 2.41$, $p < .02$). An optimal cutting score of 60 on the Goldberg Index was selected by comparing unacceptable with an equal number ($N=23$) of matched acceptables. While six unacceptables scored greater than 60, no acceptable officer scored that high. Further, the cut-off score was replicated by comparing the unacceptables with a second group of 23 matched acceptable counterparts. Only one acceptable scored greater than 60. Thus, 51 officers were correctly identified for a hit rate of 74% ($\chi^2 = 37.2$, $p < .001$). The authors reported that

the MMPI Goldberg Index detected 26% of the unacceptables and the false-positive rate was only 2%. They concluded that the MMPI Goldberg Index was useful in screening high-density samples and that further research needed to be conducted to determine what the Goldberg Index was measuring in a nonpsychiatric population.

Bartol (1982) reported his results of a long-term ongoing project (1976-1979) of psychological screening for small town Vermont police departments. Small town was defined as a community of less than 50,000 population not part of a continuous urban sprawl. The project tested 844 male police applicants in various police agencies throughout the state with the MMPI. In 1979, questionnaires were mailed to the chief of 25 police departments asking them to rate the overall performance of their officers on a 5-point scale with 1=outstanding and exceptional; 2=above average; 3=average; 4=below average and 5=poor. Of the 25 departments, 21 responded and complete information was obtained on 102 employed or previously employed police officers. Eight men were rated exceptional, 28 above average, 42 average, 18 below average and 6 poor. Twenty men left the agencies for various reasons during a two-year period.

A control group of 100 male college students who had passed the Vermont written exam for city and town law enforcement were also administered the MMPI. All students were reasonably matched primarily from rural Vermont sectors. Ages ranged from 20-38 with an average of 23.4.

Preliminary analysis revealed no significant differences between classification 1 and 2 or between 4 and 5 on any of the MMPI scales so the groups were collapsed to produce above average (1 and 2), average (3) and below average (4 and 5) classifications. However, after combining the 102 MMPI police officer scores and comparing them to the 100 control group members with a

t-test, significant differences were found between the groups on the Validity K-scale and on the Pd, Mf, Pa and Ma clinical scales. The police group scored significantly higher on all six scales. However, Bartol noted that this was with K added. When considering uncorrected scales, the police group scored significantly lower than the control group only on Hs. Of interest to note is that the police officers rated below average scored very similarly to the control group, implying that uncorrected K scores may be a powerful indicator of who will perform more or less favorably in small town police agencies.

When the police groups were compared, five MMPI scales significantly differentiated between the three groups. The below average group scored significantly higher than the average and above average groups on Pd, Hs, Pt and Ma. Below average officers scored significantly higher than average rated officers at the .05 level on Sc but scored significantly higher than above average officers at the .10 level on Sc.

Bartol (1982) concluded that the MMPI had the power to differentiate between small town police officers who perform satisfactorily on the job, as judged by their supervisors, and those who do not. In his conclusions, Bartol reported analyzing the above average and below average officer groups' MMPI questions using a discriminant analysis and revealed that 42 questions met this criterion. Although he did not report the questions, he stated that differentiating questions revealed that below average officers were often tough-minded, insensitive and had little empathy.

Johnson (1983) identified psychological instruments and their frequency of use in making decisions regarding the mental fitness or unfitness of police officer and fire fighter applicants. Psychological tests used by evaluators of 175 police officer applicants whose appeals were considered by the New Jersey Civil Service Modified Review Board during the years 1978-1981 were reviewed. The

Rotter Incomplete Sentences Blank was the most frequently used projective test and the MMPI was the most frequently utilized objective nonprojective test.

Knatz and Inwald (1983) reported on improving the selection problems for police and correction agencies by screening out law enforcement candidates who might break under stress. The authors reported that the basic objective of psychological screening is to identify those who in moments of severe, sustained stress under job conditions would either disorganize under stress and become immobilized or overreact and precipitate a crisis. They then outlined a clinical interview format used to evaluate this possibility. The 166 applicants were given the Inwald Personality Inventory (IPI) and their scores correlated with their interview ratings. Six of the IPI scales measuring "acting out," withdrawn behavior and interpersonal difficulties had correlations of .26 to .32 with overall suitability leading the authors to conclude that the interview criteria was similar to behavior and personality characteristics assessed by specific IPI scales. The MMPI was not used in this study.

Inwald and Shusman (1984) studied the IPI and the MMPI as predictors of academy performance for police recruits. The purpose of the study was to examine the predictive abilities of the IPI alone, the MMPI alone and the IPI in conjunction with the MMPI on performance criteria and supervisory ratings. The subjects were 329 employed male urban police officers. The nine performance criteria were: number of latenesses, absences, injuries received on the job, amount of formal disciplinary actions, frequency of assignment to restrictive duty, number of positive and/or negative reports received by the recruit, an overall evaluation made by a superior officer and a final rating of behavior exhibited in the 6-month training academy.

The authors found that both the IPI and the MMPI were effective in discriminating between desirable and undesirable police officer qualities in both

police officer and correction officer populations. However, they concluded that the IPI was a more effective predictor than the MMPI, although they noted that the MMPI scales helped to increase overall prediction accuracy when used in conjunction with the IPI. They emphasized that the behaviors measured on the IPI tapped a much wider range of antisocial and acting out activities than can usually be documented through biographical data or departmental investigations.

In a different study, and even more pertinent to this research, Inwald and Shusman (1984) investigated the differences between males and females on a psychological battery designed to screen law enforcement officers and then followed job performance of subsequently hired male and female recruits. The authors stated:

Past research has revealed stereotypical and negative attitudes toward females in male-dominated fields which are of special consequence in law enforcement. Public interaction and safety, as well as cooperation among law officers, demand that screening devices and supervisory techniques be valid for both female and male officers (p. 340).

The officers consisted of 2,407 persons who applied for employment as correction officers in a large urban correctional department between 1980 and 1982. Of the 2,407 applicants, 1,887 were male and 520 female. From the applicant population, a subset population was studied which consisted of 748 males and 157 females.

The 1,887 male and 520 female applicants were administered a personal history questionnaire, the IPI and the MMPI and their response patterns for differences examined. Mean scores for 14 IPI scale scores were found to be different for male and female candidates. Mean scores on 11 scales were higher for females and males had higher means on 3 scales: Trouble with the law, driving difficulties and alcohol abuse.

Relative to the MMPI, males scored higher on the K scale and the females scored higher on the Pt, Sc and Si scales. From the IPI and MMPI test results, the authors interpreted that females appeared to endorse items indicating anxiety and interpersonal difficulties with greater frequency than males. Although the authors reported those IPI and MMPI scale means and standard deviations on which there were gender differences, they report no statistical analysis or significance levels, therefore, making this portion of their study descriptive.

The second part of their study utilized 748 males and 156 hired females. Male successes, those still employed after one year, and male failures, those not employed after a year, were then compared with female successes and failures. For the total group of 748 males and 156 females, 7 percent of the males were fired within the first 10 months as compared to 4 percent of the females. Seventy-three percent of the males were still employed and 20 percent resigned. Of the females, 87 percent were still employed and 9 percent had resigned within the first year.

The authors decided to use discriminant analysis to examine the utility of the personality tests in predicting job performance. Of the IPI scales, 4 were found to be significantly higher for male failures (N=51) than male successes (N=545). The scales were: Trouble with the Law ($F=16.76$, $df=1,594$, $p < .01$); Antisocial attitudes ($F=11.80$, $df=1,594$, $p < .01$); Absence Abuse ($F=12.07$, $df=1,594$, $p < .01$) and Rigid Type ($F=10.00$, $df=1,594$, $p < .01$). The discriminant function equation correctly predicted 72 percent of the male successes and failures.

For females, only one scale was significantly higher for successes than failures: Lack of Assertiveness ($F=4.57$, $df=1,141$, $p < .05$). The authors suggested that those who were terminated may have been more aggressive

and/or outspoken than their nonterminated female counterparts. The authors noted that since the females consisted of 135 successes and only 7 failures, the number of terminated females was too small for any final conclusions to be drawn.

Next, the authors performed a discriminant function analysis on both the male and female groups using the IPI together with the MMPI and added 3 MMPI scales to the prediction equation: Pt, Mf, and Hs. The new equation increased the classification accuracy for males by one percentage point. For females, the MMPI Si scale showed a significantly lower mean for the terminated females, supporting their previous suggestion from the IPI that extroverted, assertive females were more likely to be terminated. Four MMPI scales, D, Si, Sc, and Ma, were added to the prediction equation for females and resulted in a 9 percent increase in correct classifications increasing the percentage of females correctly classified as terminated or nonterminated to 92 percent. Inwald and Shusman concluded:

In summary, sex differences were found in this study on both pre-employment tests and actual job performance. However, due to the short period of time that these officers had been on the job, the small number of females terminated, and the fact that they had already been pre-screened, it is premature to generalize these results to suggest differential long-term performance of male and female officers. The limitations of the criteria must also be taken into consideration when these data are evaluated since they provide only a small sample of the behaviors of working officers. Nevertheless, the trends found here appear to be consistent, both with other research results, and with observed and stereotypical behavior patterns of males and females. Clearly, in order for both sexes to work most efficiently together, it is necessary for further exploration to be done regarding their respective employment needs and job adjustment/coping patterns (p. 347).

Summary

In this lengthy review of the literature, the history of police selection in general and psychological assessment in particular have been reported and discussed since its inception in England in 1829. As could naturally be expected,

a great deal of growth and development in both the police selection process and the psychological assessment part of that process has occurred. Terman seems to have been the father of psychological assessment of police and firemen applicants when he began evaluating their intellectual capabilities in 1917. Since that time, many studies have been conducted, the psychological ones primarily within the last 30 years.

The use of the MMPI in police applicant screening and selection has been thoroughly reported and discussed, noting a mixture of opinions regarding its use in police applicant screening and selection. It has been the focus of many studies, particularly within the last 20 years. There seem to be two types of studies using the MMPI: those which try to use it to predict whom will succeed and those who use it for screening psychopathology. Far more prevalent are those who use it in an attempt to predict those who will later succeed. Of those studies using it to predict success, none have had sufficient numbers of females to include in their studies. Only in recent years have sufficient numbers of females been hired which will allow them to be studied. This review has laid the foundation of the need to establish the MMPI's validity in screening out unacceptable applicants, rather than predicting those who will be successful on the job. The second focus of the study was the inclusion of females. As has been documented, further research needs to be conducted relative to establishing MMPI norms for urban female police applicants. The review of literature indicates a need for using the MMPI to investigate its ability to differentiate between acceptable and unacceptable male and female applicants as well as investigate whether or not police applicants score the same regardless of gender.

CHAPTER III METHODOLOGY

Introduction

This chapter presents the methods and procedures of the study. For the purposes of presentation, the chapter is divided into six sections: Description of the population and sample; Description of the research instrument; Description of the research design; Description of procedure; Statement of the hypotheses; and Description of the method of analysis.

The purpose of this study was to investigate the empirical relationships between MMPI scores collected during traditional urban police selection procedures and the acceptable or unacceptable employment classification of an applicant. Another purpose was to focus on the inclusion of females and report MMPI norms not previously reported, as well as investigate the interaction of urban police applicant gender on the applicants' MMPI scores. The study was designed to answer the following questions:

(1) Do MMPI scores collected during the selection process validly differentiate between acceptable and unacceptable urban police applicants?

(2) Do MMPI scores collected during the selection process validly differentiate between acceptable and unacceptable male urban police applicants?

(3) Do MMPI scores collected during the selection process validly differentiate between acceptable and unacceptable female applicants?

(4) Do acceptable and unacceptable urban police applicants present the same or very similar MMPI personality profiles regardless of gender?

Description of the Population and Sample

The sample for this study was selected from a population of 479 police officer applicants. The applicant population consisted of 326 males and 153 females who applied for employment at a police department in a city of 400,000 in a Southwestern state in the United States. The data consists of information gathered over a seven-year period from 1979 through 1986. Table 1 presents demographic information for the applicant population.

Table 1

Demographic Information on Applicant Population

Category	Total
Population	
Male Applicants	326
Female Applicants	153
Officer Type	
Male Community Service Officers	146
Male Apprentice Officers	180
Female Community Service Officers	60
Female Apprentice Officers	93
Race	
Males	
Caucasion	253
Black	60
Native American	9
Hispanic	3
Females	
Caucasion	101
Black	36
Native American	3
Hispanic	4

Table 1 (Continued)

Category	Total
Marital Status	
Males	
Married	162
Single	139
Divorced	23
Females	
Married	43
Single	65
Divorced	21
Mean Age at Application	
Males	26.69
Females	25.53
Mean Education Level (Years)	
Males	14.88
Females	14.92
Acceptable and Unacceptable Applicants	
Males	
Acceptable	143
Unacceptable	183
Females	
Acceptable	62
Unacceptable	91
MMPI Rating	
Males	
Highly Acceptable	41
Very Acceptable	65
Moderately Acceptable	127
Acceptable	93
Females	
Highly Acceptable	13
Very Acceptable	31
Moderately Acceptable	70
Acceptable	39

Using the applicants' data in their personnel files, the population of 326 male and 153 female applicants were placed into either an acceptable or

unacceptable employment classification. Using SPSS-X stratified random sampling, 198 subjects were selected from the population of 326 male applicants: ninety-nine (99) acceptable for employment and ninety-nine (99) unacceptable for employment. Using SPSS-X stratified random sampling, 116 subjects were selected from the population of 153 female applicants: fifty-eight (58) acceptable for employment and fifty-eight (58) unacceptable for employment. Using Cohen's (1977) power tables for the F test and assuming a moderate effect size of .20, a sample size of 99 per cell for the male applicants allowed a power of .80 with an alpha level of .05. Using Cohen's (1977) power tables for the F test and assuming a moderate effect size of .25, a sample size of 58 per cell for the female applicants allowed a power of .77 with an alpha level of .05. The results of this study are limited in their generalizability to those persons applying for employment at police departments in cities with populations similar to the one used in this research.

Instrument

The Minnesota Multiphasic Personality Inventory (MMPI, Form R) remains the most widely utilized objective psychological police applicant screening instrument in the United States (Cohen & Chaiken, 1973; Johnson, 1983; Murphy, 1972). It was selected and used as the data gathering instrument for this study because for the MANOVA portion of the study it represents the dependent construct of which the subjects were tested and the MMPI or its equivalent is mandated by Oklahoma law to be administered to all police applicants for screening psychopathology. The inventory is easily administered and objectively scored (Dahlstrom et al., 1975) and there are available objective interpretive procedures.

The MMPI is an objective psychodiagnostic self-report inventory used to assess some of the major psychopathological characteristics that affect personal

and social adjustment. The 566-item test requires no formal training to administer or score. The individual responds "true," "false" or leaves the statement unanswered. Although it may be mailed in for computer scoring, it may alternatively be hand scored by means of an overlay. Each darkened square is counted and summed for each scale, yielding a raw score. A Correction (K) score is added to Scales Hs, Pd, Pt, Sc and Ma. Each raw score is converted to a T-Score. Persons sixteen years of age or older with at least six years of successful schooling can be expected to complete the inventory without difficulty.

The standard MMPI profile is composed of four validity scales (?, L, F, and K) and 10 clinical scales (Hs, D, Hy, Pd, Mf, Pa, Pt, Sc, Ma, and Si). Gearing (1979) and Lachar (1969) have summarized the following review of scale interpretations. The ? (questions) scale indicates the number of unanswered statements. There are 15 L (lie) scale items that attempt to identify individuals who will not admit to human foibles and attempt to "look good" by choosing the more socially acceptable response. The F (validity) scale consists of 64 questions not answered in the scored direction by 90% of the people. It nearly always measures the degree to which an individual's thoughts are different from the general population. Marked elevations tend to indicate confusion and perhaps a request for help. The K (correction) scale of 30 items measures defensiveness and guardedness. It seems to describe the subject's test taking attitude. Ofttimes, the purpose of the examination and what the subject expects to gain from it plays a role in the score of this scale. The Hs (hypochondriasis) scale contains 33 straightforward items measuring bodily complaints claimed by an individual and whether these complaints are used as a manipulative device. There is no distinction made, however, between actual and imagined physical difficulties. The D (depression) scale consists of 60 items that are mood

descriptions of depression and feelings of hopelessness, pessimism, and sadness. The Hy (conversion hysteria) scale, made up of 60 questions, has two areas of interest: One centering around bodily problems and the other denying the possibility that the subject has problems or is in any way maladjusted. The Pd (psychopathic deviate) scale consists of 50 items designed to detect amoral or antisocial types. It identifies a lack of general social adjustment, family authority problems, and social alienation. The MF (masculinity-femininity) scale, containing 60 items, sums to reflect aesthetic or athletic interests and vocational choices. The Pa (paranoia) scale consists of 40 items and detects suspiciousness, interpersonal sensitivity, and self-righteousness. The Pt (psychasthenia) scale has 48 items dealing with anxiety and fear, and is suggestive of compulsivity. The Sc (schizophrenia) scale contains 78 items and originally was intended to detect a clinical pattern of schizophrenia. It measures feelings of social and family alienation, peculiar perceptions and behavior, and difficulties in concentration and impulse control. Thus, it tends to indicate an individual's distortion of the world. The Ma (hypomaniac) scale with 46 items measures psychic energy, overactivity, and flight of ideas. The Si (social introversion) scale consists of 70 items that measure an individual's preference for being alone or being with others. The scale assesses uneasiness in social situations, insecurities, worries, and lack of social participation.

Although no quantitative data were reported, Alker states that several researchers have demonstrated that the MMPI has a valid basis for the discrimination made by its scales (Buros, 1977). Further, as an objective instrument for assessing psychopathology, it remains matchless and its scales have adequate construct validity. Hathaway and McKinley (1943) report that a high score on a scale has been found to predict positively the corresponding final clinical diagnosis in more than 60 percent of new psychiatric admissions. Norms

are based on samples aged 16 to 55, including a cross-section of college students which makes it very appropriate for administering to the typical police applicant. Test-retest reliability coefficients on normals seem adequate and are presented for each scale: Lie (L) .46; Validity (F) .75; Correction (K) .76; Hypochondriasis (Hs) .80 to .81; Depression (D) .77 to .66; Hysteria (Hs) .57 to .72; Psychopathic-deviate (Pd) .71 to .80; Masculinity-Femininity (Mf) .91; Paranoia (Pa) .56; Psychasthenia (Pt) .74 to .90; Schizophrenia (Sc) .86; Hypomania (Ma) .83 to .76; and Social-Introversion (Si) .93 (Hathaway & McKinley, 1967).

Description of the Research Design

The first part of the study utilizes a correlational research design. It was selected because of its feasibility for randomization and its appropriateness for determining whether a relationship exists between two or more quantifiable variables and if so, to what degree. It is also appropriate for this study because it may be used in making predictions relative to those relationships. Furthermore, it is appropriate since measurements are taken on groups of individuals and relationships determined among the measures and the investigator does not intervene in any way nor expose subjects to a manipulation. Finally, it permits the measurement of several variables and their interrelationships simultaneously in a natural realistic setting. This type of design yields useful information for tentative hypotheses regarding the relationship between several independent variables and a single dependent variable.

The following are potential limitations of the correlational research design: It identifies what goes with what and not cause-and-effect relationships; It is less rigorous than the experimental design because it exercises less control over the independent variables; It is prone to identify spurious relational patterns

which have little or no reliability or validity; and the relational patterns may be arbitrary and ambiguous. However, the present study was formulated to allow for the last three and they do not present a threat to the study.

The second part of the study utilizes a causal-comparative or ex post facto research design to test the fourth null hypothesis. This design was selected because of its feasibility for randomization and its appropriateness for investigating possible cause-and-effect relationships by observing some existing consequences and searching back through the data for plausible causal factors. It is appropriate for this study because the purpose is to measure a characteristic or construct as it already exists. This type of design yields useful information for tentative hypotheses about the nature of effects of independent variables and dependent variables.

The main weakness of most ex post facto designs is the lack of control over independent variables. This part of the study has one independent variable, gender, and does not represent a threat since gender is a discrete variable. Other potential weaknesses for this part of the study include: (1) The possibility that the relevant causative factor(s) have been excluded from the study; (2) the findings may result not only from multiple causes but also from one cause in one instance and from another cause in another instance; (3) when a relationship between two variables is discovered, determining which is the cause and which is the effect may be difficult; (4) the fact that two, or more, factors are related does not necessarily imply a cause-and-effect relationship; they all may simply be related to an additional factor not recognized or observed. Thus, only tentative conclusions can be drawn from the results.

Description of Procedure

After a person expressed an interest in becoming a police officer, he or she was mailed a letter explaining the requirements, qualifications and selection

process. Those who believed themselves qualified, contacted the city personnel department to be scheduled for a full day of testing including completing the employment application forms. No one was considered an applicant until they had completed all employment applications and tests of comprehension, writing, attitudes, physical agility and personality. All applicants were group administered a reading comprehension test, a writing skills test, an attitudinal test, a physical agility test, and the MMPI Form R. Although the MMPI was a requirement, it did not determine the employment classifications.

In order to be considered eligible for selection, applicants had to meet the following criteria: 21 years old; no felony or moral turpitude convictions; no dishonorable discharge from the United States Armed Forces; no falsification on employment application; passed a medical examination given by the city physician; weighed no more than 25% greater of normal for their height; vision corrected to 20/20 in one eye but not to exceed 20/40 in the other eye; contact lenses and glasses acceptable; hearing normal in both ears - no hearing aid devices acceptable; possess 108 college semester hours if applying for the position of police officer or have a high school diploma or GED certificate if applying for the position of community service officer.

Standard MMPI profiles were gathered on applicants for the positions of police officer and community service officer during the period of 1979 through 1986. From a pool of 479 applicants who applied for employment on a police force in a large urban city in a Southwestern state, 198 males and 116 females were randomly selected.

The test administrator was a male certified psychometrist with a master's and Ph.D. degree in applied behavioral studies (counseling) and over two years experience in the use of all tests. The MMPI profiles of only those applicants who passed the physical agility, reading comprehension and writing tests were

scored. Each profile was hand scored by the test administrator yielding a raw score which was converted to a T-score, and sent to the police department's counseling psychologist for assessment. Each profile was rated on a numerical scale from 1 to 5, and returned to the police department's personnel director. A rating of 1 indicated no significant elevation on any scale. A rating of 2 indicated some slight deviation from MMPI normals. A rating of 3 indicated mild to moderate elevations from MMPI normals on a few scales. A rating of 4 indicated some moderate elevations but none 2 standard deviations above or below MMPI normals. A rating of 5 indicated scale score(s) equal to or greater than 2 standard deviations above/below MMPI normals. A 5 rating automatically eliminated those applicants from further employment eligibility by the police department and were excluded from the population for this study. All applicants receiving a rating of 1 to 4 were processed for further employment eligibility and were included in the population of this study.

Further employment processing included a comprehensive medical examination, background investigation, and an oral police board interview.

A comprehensive medical examination was performed by the City physician or the applicant's personal physician. If the examination was performed by a personal physician, the results were sent to the City physician for review. The City physician assigned a Pass or Fail rating to each examination and forwarded the results to the personnel director.

A background investigation of the applicant was performed by Police Academy background investigators. They checked such things as: driving record, credit history, legal history, personal and character references, previous employment history for incidents of misconduct, etc. An investigative report was submitted to the Head of the Police Academy. The Head of the Police

Academy then submitted a recommendation along with the investigative report to the personnel director.

The police board, consisting of five persons, conducted an oral interview with the applicant. Each of the five board members scored the applicant on a scale of 1 to 100. The five scores were averaged and the resultant score was the overall oral police board interview score. A score of 70 was required to be considered further for employment eligibility. Results were forwarded to the personnel director.

The personnel director, after receiving the results of the medical examination, background investigation, and board interview, reviewed the applicant's file. If the applicant failed the medical examination and/or received a score of less than 70 for the oral police board interview, the applicant was classified as unacceptable for employment. If the applicant passed the medical examination and received a score of 70 or higher for the oral police board interview, the applicant's file, including the recommendation and the background investigation, was forwarded to the Chief of Police for a final decision as to employment classification. The MMPI rating (1 to 4) by the department psychologist was not included in the applicant's file forwarded to the Chief of Police. The Chief of Police classified the applicant as acceptable or unacceptable for employment.

This study used the same employment classifications for applicants as those assigned by the Chief of Police and personnel director.

Statement of the Hypotheses

Ho₁ There are no significant discriminating clinical or validity MMPI scales on which acceptable and unacceptable urban police applicants differ.

- Ho₂ There are no significant discriminating clinical or validity MMPI scales on which acceptable and unacceptable male urban police applicants differ.
- Ho₃ There are no significant discriminating clinical or validity MMPI scales on which acceptable and unacceptable female urban police applicants differ.
- Ho₄ There are no significant differences between male and female police applicants based on the distribution of their MMPI scores.

Description of Method of Analysis

In order to test the first three hypotheses to determine whether the MMPI could be used to differentiate between acceptable and unacceptable urban police applicants, a stepwise discriminant function analysis was performed ($p < .05$) to see how applicants could best be assigned to acceptable and unacceptable groups (dependent variable) on the basis of several independent variables (MMPI scale scores). Discriminant analysis is the most appropriate statistical procedure for predicting group membership, as well as the most appropriate approach due to the use of continuous independent variables. Also, discriminant analysis assumes that the sampling distribution of any linear combination of continuous predictor variables is normally distributed. Assumptions underlying discriminant analysis are:

- 1) Multivariate normality was met because the MMPI predictor scores were randomly sampled from the population of scores.
- 2) Sample size requirements were met because sample size of the smallest group (58) exceeded the number of predictor variables (18) and the cell n ratio was not greater than 4 to 1.
- 3) Examination of group histograms indicated no outliers.

4) Homogeneity of variance-covariance was met by using equally sized large samples. Additionally, Box's M was performed on all three analyses and indicated the sample variances to be homogeneous.

5) Independence of the levels of the independent variable were met by using the discrete variable employment classification to define the groups. Each subject belonged to one, and only one, group, acceptable or unacceptable.

6) Dependence of the dependent variable was met through examination of the within cells correlation matrices for values $> .3$ and $< .8$

7) Multicollinearity and singularity were not present as indicated by the lack of perfect correlations in the error correlation matrix, Determinant .001, and using a stepwise hierarchical entry of variables into the analysis.

Wilks lambda and its associated chi square were utilized as the test of overall significance and were found to be significant. The canonical correlation coefficient squared was used to report the proportion of variation in the discriminant function explained by the two groups.

The statistical design utilized in this study to test the fourth hypothesis was a 1 X 2 fixed factor multivariate analysis of variance (MANOVA) with the factor being applicant gender (male or female). A One-Way Between Subjects MANOVA, Hotelling's T, was used to analyze the interaction of urban police applicant gender on the applicants' MMPI scale scores as examination of the error correlation matrix of the dependent variables indicated the formation of a construct ($.3 < r < .8$). To test this question, there was one independent variable, applicant gender, having two levels, male or female. There were thirteen dependent variables: The applicant's MMPI scale scores on the Lie (L), Frequency (F), Correction (K), Hypochondriasis + Correction (K) (Hy), Depression (D), Hysteria (Hs), Psychopathic-deviate + Correction (K) (Pd), Masculinity-femininity (Mf), Paranoia (Pa), Psychasthenia + Correction (K) (Pt),

Schizophrenia + Correction (K) (Sc), Hypomania + Correction (K) (Ma) and Social introversion (Si) scales. This statistical design was selected because there is at least one categorical independent variable and more than one continuous dependent variable. MANOVA's distinct advantage over ANOVA is that it will allow the researcher to evaluate the mean differences on all of the dependent variables simultaneously, while controlling for the intercorrelations among them. This allows the researcher to examine the relationships among the dependent variables for the group comparisons and select the variables that contribute most to group separation. Bray and Maxwell (1985) report that it is almost always better to multi-operationalize a construct rather than mono-operationalize a construct. Further, MANOVA is a more appropriate statistical solution to the problem of inflated Type I error when multiple dependent measures are used and it is powerful for detecting legitimate experimental effects across more than one dependent variable (Larrabee, 1982; Leary & Altmaier, 1980; Strahan, 1982). Lastly, the literature and experience indicates logical sense to the construct.

All MANOVA assumptions but one were met. Homogeneity of variance was not met as indicated by Box's M ($F=1.72727$, $df=91,187453$, $p < .001$). However, the F test is robust and can withstand the violation of one assumption.

Assumptions underlying the use of MANOVA are:

- 1) Multivariate normality was met because the MMPI predictor scores were randomly sampled from the population of scores. Multivariate analysis of variance assumes that the sampling distribution of any linear combination of continuous predictor variables is normally distributed. Linearity is assumed since a dependent construct was formed.

- 2) Sample size requirements were met because the n of the smallest group did not exceed the cell n ratio of 4 to 1.

3) Independence of levels of the independent variable was met as indicated by the Determinant being greater than .001, and using the discrete variable, gender. Subjects belonged either in the male group or the female group.

4) Dependence of the dependent variables was met as indicated by the within cells correlation matrix of values $.3 < r < .8$ and Bartlett's was significant.

An investigation was made of the interaction of applicant gender on each dependent measure. Wilks lambda was used for the overall strength of association measure and Eta squared was used as the strength of association for the univariates.

CHAPTER IV

RESULTS

This chapter of the dissertation presents the results. The chapter has been divided into two sections: Discriminant analysis and multivariate analysis of variance. Discriminant analysis was utilized to test the first three null hypotheses. Multivariate analysis of variance was used to test the fourth hypothesis.

The first section is directed toward the identification of MMPI scales which discriminated between all urban police applicants rated acceptable and unacceptable for employment; male urban police applicants rated acceptable and unacceptable for employment; and female urban police applicants rated acceptable and unacceptable for employment. Significant discriminant functions were found for each sample.

The second section was directed toward detecting if significant differences existed between male and female urban police applicants based on the distribution of their MMPI scores. A one-way multivariate analysis of variance found significant differences between male and female urban police applicants' scores with females scoring higher on the masculinity-femininity, psychasthenia, paranoia and depression scales.

Discriminant Analysis

Discriminant analysis is a statistical technique which allows the researcher to study the differences between two or more groups of cases with respect to several variables simultaneously. The groups are defined so that each case belongs to one, and only one, group. The researcher selects a collection of

variables that measure characteristics on which the groups are expected to differ. The mathematical objective of discriminant analysis is to weight and linearly combine the discriminating variables so that the groups are forced to be as statistically distinct as possible. The researcher wants to be able to discriminate between the groups in the sense of being able to tell them apart.

Discriminant analysis is a broad term that refers to several closely related statistical activities which researchers use for interpretive analysis and/or classification. Once discriminant functions have been derived, interpretive analysis and classification can be pursued. Interpretive analysis measures the success with which the discriminating variables actually discriminate between the groups, how well they discriminate, and which characteristics are the most powerful discriminators when combined into the canonical discriminate function. The weighting coefficients identify the variables which contribute most to differentiation along the respective function.

The other application is to derive one or more mathematical equations, after the initial computation, for the purpose of classification. Once a set of variables is found which provides satisfactory discrimination for cases with known membership, a set of classification functions are derived that permit the classification of new cases with unknown membership. These equations, named classification discriminant function, combine the group characteristics in a way to allow the researcher to predict the group in which a case most likely belongs. As a check of the discriminant classification function's adequacy, the original set of cases are classified to see how many cases are correctly classified by the variables being used.

The classification procedure uses a separate linear combination of the discriminating variables for each group. They produce a probability of membership in the respective group, and the case is assigned to the group with

the highest probability. When there are only two groups, only one discriminant function is possible. The unstandardized coefficients are used to obtain a discriminant score for the function by multiplying each coefficient by the respective variable value and summing the products plus the constant. The discriminant score locates the case on the continuum representing the function. The zero point for the continuum is the grand mean of all classified cases, both acceptable and unacceptable.

Null-hypothesis number one stated that MMPI scores collected during the selection process do not significantly discriminate between acceptable and unacceptable employment classifications of urban police applicants. A stepwise discriminant function analysis was performed with the usual 13 MMPI scales as predictors of membership in the two groups. Uncorrected raw scale scores were not used in the analysis. Various fractions of the Correction (K) score were included in the raw scores of Hs, Pd, Pt, Sc, and Ma, and its purpose is to improve the five clinical scales' validity when they may be impaired by a defensive response set. This is the normal MMPI scoring procedure. With two groups, the maximum number of significant discriminant functions is one. The resulting discriminant function was statistically significant ($p < .0001$) and correctly classified 66.88% of all subjects. Table 2 presents the classification results and Table 3 the classification coefficients for the discriminant function. The classification results must be considered tentative because they were computed on the same groups on which the function was developed and not on a cross-validation group. Uncorrected raw scale scores are reported for informational purposes. The mean and standard deviation MMPI corrected and uncorrected raw scores for the entire sample and acceptable and unacceptable police applicants are presented in Table 4. Mean profiles for acceptable and

unacceptable applicants are presented in Figure 1. The mean and standard deviation MMPI corrected and uncorrected raw scores for employment classification by gender are presented in Table 5. Mean profiles for male and female acceptable and unacceptable applicants are presented in Figure 2.

Examination of the function for predicting acceptability for all applicants indicates that six (6) of the thirteen (13) variables were significant ($X^2=52.870$, $df=6$, $p < .001$): Liescale, Correction, Psychopathic-deviate + K, Paranoia, Hypomania + K, Social-Introversion. Examination of the canonical correlation coefficient $(.3965)^2$ or eta squared, indicates the proportion of variation in the discriminant function explained by the groups to be 15.72%. Examination of the group centroids found the function to significantly separate the two groups. Centroid locations for the acceptable group and the unacceptable group were $\bar{X} = -0.430$, and 0.430 respectively (see Table 6). Examination of the ordered correlations (see Table 7) between MMPI predictors and the discriminant function indicates the primary variables in predicting group membership to be liescale ($r=.60$), psychopathic- deviate + K ($r=.60$), paranoia ($r=.42$), and hysteria ($r=.33$). Loadings less than $.33$ were not interpreted because they did not increase the probability of correct classification. Unacceptable applicants, regardless of gender, had higher scores on all discriminating variables than acceptable applicants indicating unacceptable applicants to be more deliberately evasive, impulsive, suspicious and more likely to unconsciously convert psychological conflicts into physical illness when stressed. Unstandardized canonical discriminant coefficients are presented in Table 8. Based on the results of the stepwise discriminant function analysis, the first null hypothesis was rejected. There were variables which significantly discriminate between acceptable and unacceptable applicants.

Table 2

Classification Results for Multiple Discriminant Function
on Acceptable and Unacceptable Police Applicants

Actual Group Membership	Number of Cases	Predicted Group Membership	
		Accepted	Rejected
Acceptable	157	107	50
		68.2%	31.8%
Unacceptable	157	54	103
		34.4%	65.6%
Percent of Cases Correctly Classified		66.88%	
Acceptable Males	99	65	34
		65.7%	34.3%
Unacceptable Males	99	36	63
		36.4%	63.6%
Percent of Cases Correctly Classified		64.65%	
Acceptable Females	58	42	16
		72.4%	27.6%
Unacceptable Females	58	17	41
		29.3%	70.7%
Percent of Cases Correctly Classified		71.55%	

Table 3
Classification Function Coefficients
of Three Discriminant Analyses^a

Group and Variable	Acceptable	Unacceptable
<u>Males^b</u>		
Liescale	-.231751	.251008
Correction	1.459439	1.270814
Depression	1.824176	1.894795
Psychopathic-Deviate + K	1.142599	1.349028
Paranoia	1.172934	1.267677
Schizophrenia + K	-.925434	-.871209
Hypomania + K	1.541224	1.462077
Social Introversion	.881986	.817552
<u>Females^c</u>		
Liescale	.466423	.796441
Depression	1.624946	1.468760
Psychopathic-Deviate + K	.359042	.540113
Masculinity-Femininity	1.465892	1.369765
Paranoia	-.499385	-.198380
Psychasthenia + K	.248976	.367113
Schizophrenia + K	1.653482	1.454346
<u>All Applicants^d</u>		
Liescale	.505157	.803263
Correction	1.234998	1.113824
Psychopathic-Deviate + K	.914157	1.111201
Paranoia	.929834	1.077931
Hypomania + K	1.116420	1.065102
Social-Introversion	1.101522	.979648

^a Classification coefficients may be utilized to predict classification group when group membership is unknown. Classification coefficients are tentative until cross-validated on a different group.

^b Group consisted of 99 acceptable and 99 unacceptable male applicants.

^c Group consisted of 58 acceptable and 58 unacceptable female applicants.

^d Groups consisted of 157 acceptable and 157 unacceptable applicants.

Table 4

Means and Standard Deviations of MMPI Raw Scale
Scores as a Function of Employment Classification

Scale	Employment Classification					
	Acceptable		Unacceptable		Entire Sample	
	n = 157		n = 157		n = 314	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Liescale (L)	4.292	1.978	5.420	2.391	4.856	2.262
Frequency (F)	2.356	2.003	2.477	1.995	2.417	1.997
Correction (K)	17.649	3.951	18.471	4.407	18.060	4.199
Hypochondriasis	1.566	1.812	1.579	1.633	1.573	1.722
Hypochond + K (Hs)	10.611	1.893	11.076	2.202	10.843	2.063
Depression (D)	16.280	2.952	16.694	2.510	16.487	2.743
Hysteria (Hy)	18.490	2.859	19.280	3.073	18.885	2.989
Psychopathic-Deviate	13.662	2.570	14.961	3.104	14.312	2.919
Psych-Deviate + K (Pd)	20.649	3.023	22.324	3.519	21.487	3.381
Mascul-Feminity (Mf)	26.923	7.029	26.726	6.488	26.824	6.754
Paranoia (Pa)	8.082	2.238	8.904	2.278	8.493	2.292
Psychasthenia	6.006	4.116	5.917	4.115	5.961	4.109
Psychasthenia + K (Pt)	23.936	4.227	24.261	3.602	24.098	3.924
Schizophrenia	5.528	4.689	5.229	3.696	5.378	4.218
Schizophrenia + K (Sc)	23.267	5.149	23.636	3.684	23.452	4.474
Hypomania	16.585	4.434	15.917	3.394	16.251	3.957
Hypomania + K (Ma)	20.280	5.945	19.522	3.066	19.901	4.737
Social-Introversion (Si)	20.987	6.423	20.579	6.141	20.783	6.277

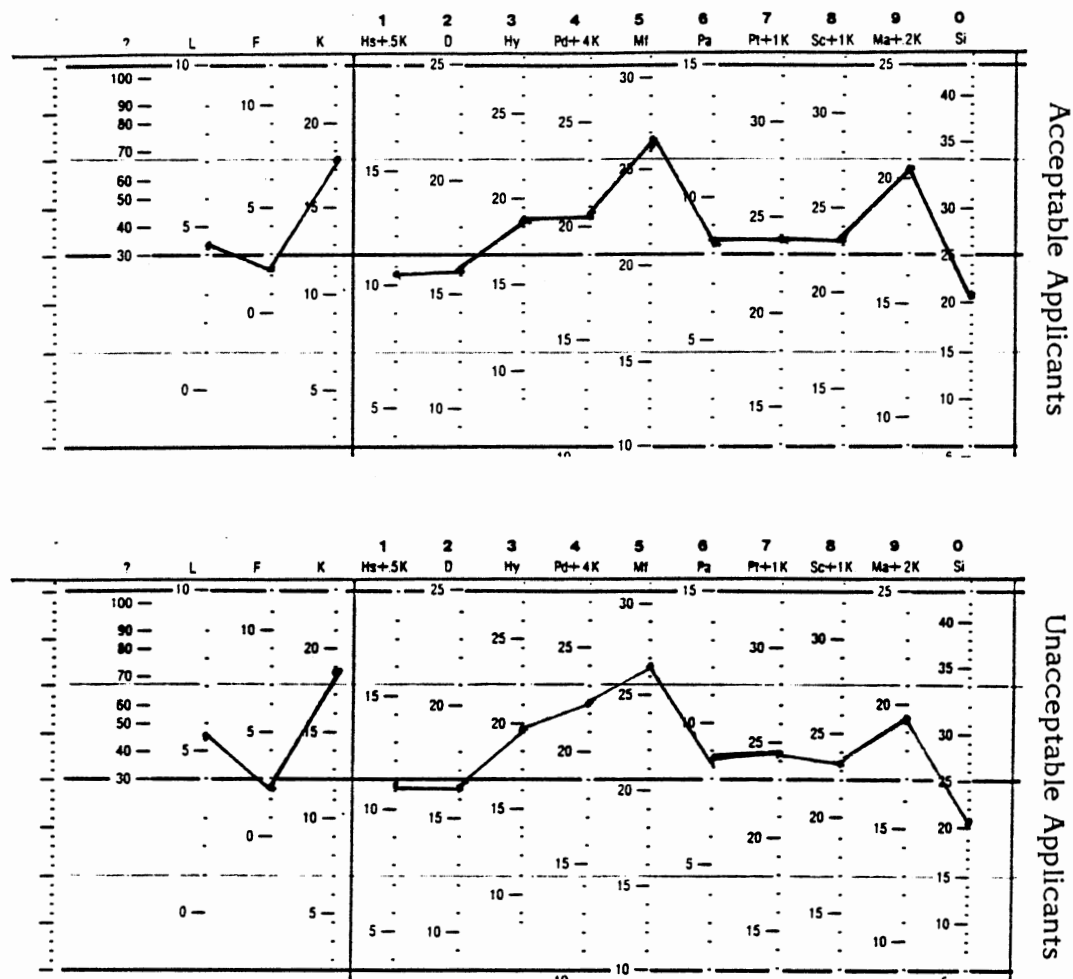


Figure 1. Mean Profiles for Acceptable and Unacceptable Applicants
(See Table 4 for explanation of scale abbreviations)

Null hypothesis number two stated that MMPI scores collected during the selection process do not significantly discriminate between acceptable and unacceptable employment classifications of male urban police applicants. A stepwise discriminant function analysis was performed with the usual 13 MMPI scales as predictors of membership in the two groups. Uncorrected raw scale scores were not used in the analysis. The resulting discriminant function was

Table 5

Means and Standard Deviations of MMPIRaw Scale Scores as a Function ofEmployment Classification and Gender

Scale	Employment Classification							
	Acceptable				Unacceptable			
	Males		Females		Males		Females	
	n = 99		n = 58		n = 99		n = 58	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Liescale (L)	4.535	1.955	3.879	1.965	5.484	2.305	5.310	2.549
Frequency (F)	2.323	2.122	2.413	1.797	2.646	1.981	2.189	2.004
Correction (K)	17.767	3.906	17.448	4.053	18.181	4.260	18.965	4.645
Hypochondriasis	1.434	1.949	1.793	1.541	1.616	1.688	1.517	1.547
Hypochond + K (Hs)	10.444	1.847	10.896	1.952	10.959	2.203	11.275	2.206
Depression (D)	15.808	2.838	17.086	2.992	16.646	2.459	16.775	2.616
Hysteria (Hy)	18.393	2.633	18.655	3.225	19.171	2.941	19.465	3.304
Psycho-Deviate	13.626	2.418	13.724	2.833	14.959	3.070	14.965	3.189
Psycho-Dev + K (Pd)	20.626	2.954	20.689	3.163	22.222	3.382	22.500	3.766
Mascul-Femin (Mf)	22.666	4.137	34.189	4.540	23.030	4.178	33.034	4.580
Paranoia (Pa)	8.151	2.037	7.965	2.561	8.757	2.428	9.155	1.989
Psychasthenia	5.757	4.170	6.431	4.022	5.888	3.713	5.965	4.757
Psysthenia + K (Pt)	23.969	4.805	23.879	3.032	23.979	3.605	24.741	3.576
Schizophrenia	5.262	4.986	5.982	4.135	5.353	3.772	5.017	3.585
Schizophr + K (Sc)	23.171	6.003	23.431	3.250	23.444	3.777	23.965	3.529
Hypomania	16.717	4.815	16.362	3.726	15.898	3.424	15.948	3.373
Hypomania + K (Ma)	20.515	6.980	19.879	3.564	19.404	3.043	19.724	3.122
Social-Introv (Si)	20.757	6.406	21.379	6.488	20.363	6.048	20.948	6.334

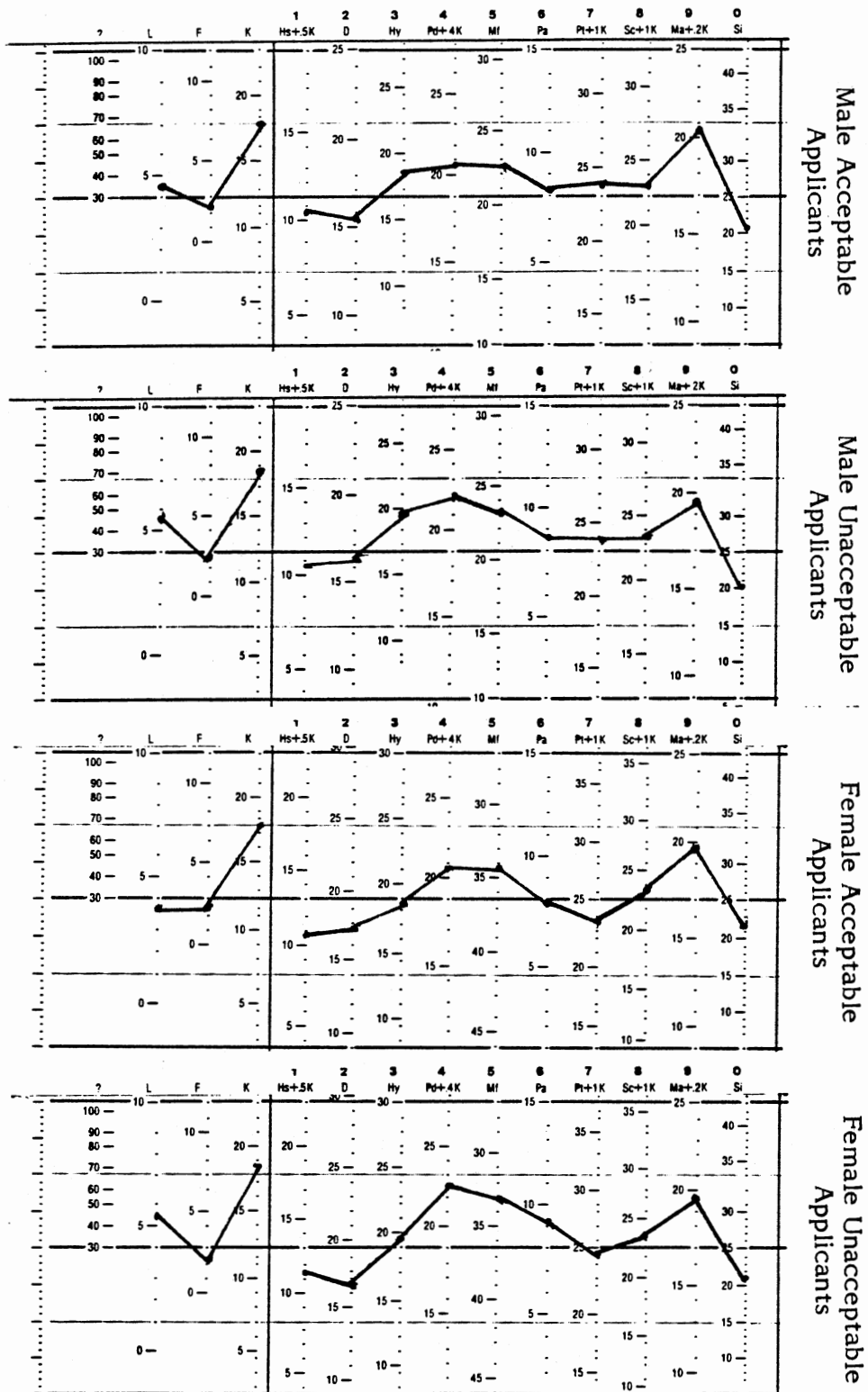


Figure 2. Mean Profiles for Male and Female Acceptable and Unacceptable Applicants

Table 6

Canonical Discriminant Analysis Results

	Canonical Correlation	Eta Squared	Group Centroid \bar{X}	Wilks Lambda	Chi- Squared	D.F.	Signif.
All Applicants	.3965634	15.72%		.8427375	52.870*	6	.0001
Accept.			-0.430				
Unaccept.			0.430				
Males	.4004893	16.03%		.8396083	33.565*	8	.0001
Accept.			-0.434				
Unaccept.			0.434				
Females	.5003910	25.03%		.7496088	31.847*	7	.0001
Accept.			-0.573				
Unaccept.			0.573				

*p < .05

statistically significant ($p < .0001$) and correctly classified 64.65% of all subjects. Table 2 presents the classification results and Table 3 the classification coefficients. Classification results must be considered tentative because they were computed on the same groups on which the function was developed and not on a cross-validation group. The mean and standard deviations MMPI corrected and uncorrected raw scores for acceptable and unacceptable male police applicants are presented in Table 5.

Examination of the function for predicting acceptability indicates that eight (8) of the thirteen (13) variables were significant ($X^2=33.565$, $df=8$,

Table 7

Ordered Within-Groups Correlations Between Discriminating
Variables and Canonical Discriminant Functions

All Applicants		Males		Females	
MMPI Variable	r	MMPI Variable	r	MMPI Variable	r
Liescale	.59648*	Psych-Dev+K	.57789*	Liescale	.54868*
Pysch-Dev+K	.59289*	Liescale	.51079*	Pysch-Dev+K	.45425*
Paranoia	.42243*	Depression	.36303*	Paranoia	.45271*
Hysteria	.33114*	Paranoia	.33108*	Correction	.41290*
Hypochond+K	.29842	Hysteria	.27149	Hysteria	.29417
Correction	.22729	Hypomania+K	.23727	Hypochond+K	.28134
Depression	.21568	Hypochond+K	.21895	Psysthenia+K	.22690
Hypomania+K	-.18606	Correction	.11650	Mascu-Femin	-.22106
Introversion	-.07533	Frequency	.07991	Introversion	-.16319
Schizophr+K	.06310	Introversion	-.07271	Schizophr+K	.13748
Frequency	.02932	Schizophr+K	.06252	Depression	-.09635
Psysthenia+K	.02441	Mascu-Femin	.03794	Frequency	-.03151
Mascu-Femin	-.00606	Psysthenia+K	.00197	Hypomania+K	.01731

*Discriminant function primary variables used to predict group membership.

Table 8

Unstandardized Canonical Discriminant Coefficients*

MMPI Variable	Males	MMPI Variable	Females	MMPI Variable	All Applicants
Liescale	.31525	Liescale	.28799	Liescale	.34614
Correction	-.21688	Depression	-.13630	Correction	-.14070
Depression	.81197	Psych-Dev+K	.15801	Psych-Dev+K	.22879
Psych-Dev+K	.23735	Mascu-Femin	-.83887	Paranoia	.17196
Paranoia	.10843	Paranoia	.26268	Hypomania+K	-.59587
Schizophren+K	.62348	Psysthenia+K	.10309	Introversion	-.41313
Hypomania+K	-.91002	Schizophren+K	-.17378		
Introversion	-.74086				

*Unstandardized coefficients are used for computational purposes when the original discriminating variables are in raw score values to determine which variable contributes most to determining scores on the function.

$p < .0001$): Liescale, Correction, Depression, Psychopathic-deviate + K, Paranoia, Schizophrenia + K, Hypomania + K, Social-Introversion. Examination of the canonical correlation coefficient $(.4044)^2$ or eta squared, indicates the proportion of variation in the discriminant function explained by the groups to be 16.03%. Examination of the group centroids found the function to significantly separate the two groups. Centroid locations for the acceptable group and the unacceptable group were $\bar{X} = -0.434$ and 0.434 respectively (see Table 6). Examination of the ordered correlations (see Table 7) between MMPI predictors and the discriminant function indicates the primary variables predicting group

membership to be psychopathic-deviate + K ($r=.58$), liescale ($r=.51$), depression ($r=.36$), and paranoia ($r=.31$). Loadings less than .31 were not interpreted as they did not significantly increase the probability of correct classification. While both acceptable and unacceptable male applicants scored within normal limits, unacceptable male applicants scored higher on all discriminating variables, indicating greater impulsivity, deliberate evasiveness, dissatisfaction with current comfort level and a tendency to blame others for their difficulties. Unstandardized canonical discriminant coefficients are presented in Table 8. Based on the results of the stepwise discriminant function analysis, the second null hypothesis was rejected. There were variables which significantly discriminated between acceptable and unacceptable urban male applicants.

Null hypothesis number three stated that MMPI scores collected during the selection process do not significantly discriminate between acceptable and unacceptable employment classifications of female police applicants. A stepwise discriminant function analysis was performed with the usual 13 MMPI scales as predictors of membership in the two groups. Uncorrected raw scale scores were not used in the analysis. The resulting discriminant function was statistically significant ($X^2=31.84$, $df=7$, $p < .0001$) and correctly classified 71.55% of all subjects. Tables 2 and 3 present the classification results and coefficients. Classification results must be considered tentative because they were computed on the same groups on which the function was developed and not on a cross-validation group. The means and standard deviations MMPI corrected and uncorrected raw scores for acceptable and unacceptable female police applicants are presented in Table 5.

Examination of the functions for predicting acceptability indicates that seven (7) of the thirteen (13) variables were significant ($X^2=31.84$, $df=7$, $p < .0001$): Liescale, Depression, Psychopathic-deviate + K, Masculinity-

femininity, Paranoia, Psychasthenia + K, Schizophrenia + K. Examination of the canonical correlation coefficient $(.5293)^2$ or eta squared, indicates the proportion of variation in the discriminant function explained by the groups to be 25.03%. Examination of the group centroids found the function to significantly separate the two groups. Centroid locations for the acceptable group and the unacceptable group were $\bar{X} = -0.572$ and 0.572 respectively (see Table 6). Examination of the ordered correlations (see Table 7) between MMPI predictors and the discriminant function indicates the primary variables predicting group membership to be liescale ($r=.54$), psychopathic-deviate + K ($r=.45$), paranoia ($r=.45$), and correction ($r=.41$). Loadings less than .31 were not interpreted. Unacceptable female applicants scored higher on all discriminating variables, indicating more deliberate evasiveness, greater impulsivity, suspiciousness, and more defensive. Unstandardized canonical discriminant coefficients are presented in Table 8. Based on the results of the stepwise discriminant function analysis, the third null hypothesis was rejected. There were variables which significantly discriminate between acceptable and unacceptable urban female applicants.

Multivariate Analysis of Variance (MANOVA)

Null-hypothesis number four stated there are no significant differences between male and female urban police applicants based on the distribution of their MMPI scores. A 1 X 2 between subjects multivariate analysis of variance (MANOVA) was performed as examination of the error correlation matrix of dependent variables indicated that a construct was formed. The fixed independent variable was gender (1 = male; 2 = female). The dependent construct was psychopathology as measured by the scales lie, frequency, correction, hypochondriasis + K, depression, hysteria, psychopathic-deviate + K, masculinity-femininity, paranoia, psychasthenia + K, schizophrenia + K,

hypomania + K, and social-introversion on the Minnesota Multiphasic Personality Inventory (MMPI). Table 9 presents the means and standard deviations for gender. Mean profiles for males and females are presented in Figure 3. Table 10 presents the summary of the multivariate analysis.

When examining the main effect gender, a significant multivariate difference was found for the psychopathology dependent construct ($F=43.61$, $df=13,300$, $p < .001$). Support for the construct from the univariate Fs was found for depression ($F=4.87$, $df=1,312$, $p < .028$); and masculinity-femininity ($F=455.47$, $df=1,312$, $p < .001$). The table value for the univariate Fs on gender with $F(1,312) = 3.84$. Since the comparison involved only two groups, specific post hocs utilizing contrasts were not performed. However, inspection of the cell means of the dependent variable masculinity-femininity and depression indicated that female applicants scored higher than male applicants. Wilks lambda ($1 - \text{Wilks}$) was used as the global strength of association measure for the multivariate test and indicated that 65.39% of the variance in the linear combination of psychopathology was accounted for by police applicant gender. Eta squared was used as the univariate strength of association measure and indicated that: 1) 1.54% of the variability in depression scores was accounted for by applicant gender and 2) 59.44% of the variability in masculinity-femininity scores was accounted for by applicant gender (see Table 9).

A 1 X 2 one-way between subjects MANOVA, Hotelling's T, was used to analyze the interaction of urban police applicant gender on the applicants' MMPI scale scores since the error correlation matrix indicated a dependent construct was formed. Based on the results, the fourth null hypothesis was rejected. There were two scales on which gender had an effect: Depression ($F=4.87$, $df=1,312$, $p < .0001$) and masculinity-femininity ($F=455.47$, $df=1,312$, $p < .0001$). Although male and female Mf T-scores were very close, their raw scores were

Table 9

Means and Standard Deviations of MMPI
Raw Scale Scores as a Function of Gender

Scale	Gender					
	Male		Female		Entire Sample	
	n = 198		n = 116		n = 314	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Liescale (L)	5.010	2.184	4.594	2.377	4.856	2.262
Frequency (F)	2.484	2.054	2.301	1.898	2.417	1.997
Correction (K)	17.974	4.082	18.206	4.406	18.060	4.199
Hypochondriasis	1.525	1.821	1.655	1.544	1.573	1.722
Hypochond + K (Hs)	10.702	2.044	11.086	2.083	10.843	2.063
Depression (D)	16.227	2.681	16.931	2.802	16.487	2.743
Hysteria (Hy)	18.782	2.811	19.060	3.276	18.885	2.989
Psychopathic-Deviate	14.292	2.836	14.344	3.067	14.312	2.919
Psych-Deviate + K (Pd)	21.424	3.266	21.594	3.580	21.487	3.381
Mascul-Feminity (Mf)	22.848	4.151	33.612	4.577	26.824	6.754
Paranoia (Pa)	8.454	2.256	8.560	2.360	8.493	2.292
Psychasthenia	5.823	3.939	6.198	4.392	5.961	4.109
Psychasthenia + K (Pt)	23.974	4.237	24.310	3.329	24.098	3.924
Schizophrenia	5.308	4.410	5.500	3.884	5.378	4.218
Schizophrenia + K (Sc)	23.308	5.004	23.698	3.388	23.452	4.474
Hypomania	16.308	4.187	16.155	3.545	16.251	3.957
Hypomania + K (Ma)	19.959	5.399	19.801	3.336	19.901	4.737
Social-Introversion (Si)	20.560	6.217	21.163	6.387	20.783	6.277

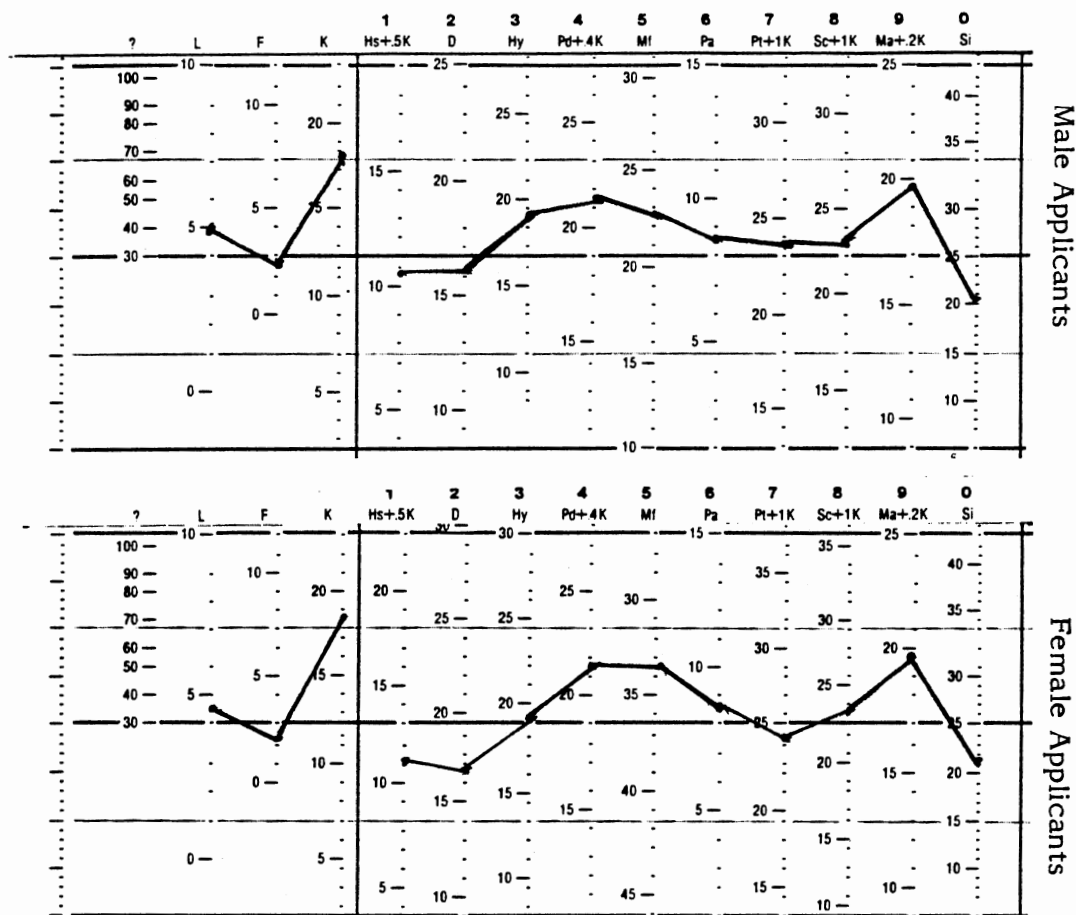


Figure 3. Mean Profiles for Male and Female Applicants

not. Male \bar{X} raw scores were 22.85 and female \bar{X} raw scores were 33.61. While the mean T-scores are not useful, the raw scores significantly differentiate between male and female applicants. However, evaluators do not need a test to identify an applicant's gender. Mean (\bar{X}) Depression raw scores were nearly identical (males=16.227; females=16.931). This suggests that neither group was depressed, and their scores impractical for use.

Table 10

Summary of Analysis for 1X2 MANOVA

Source	Multivariate			Univariate		
	df	f	n ²	df	f	n ²
Gender	18,295	31.84*	.66			
Liescale				1,312	2.48	--
Frequency				1,312	.614	--
Correction				1,312	.222	--
Hypochondriasis + K				1,312	2.55	--
Depression				1,312	4.87*	.0154
Hysteria				1,312	.629	--
Psycho-Deviate + K				1,312	.185	--
Masculinity-Feminity				1,312	455.47*	59.34
Paranoia				1,312	.155	--
Psychasthenia + K				1,312	.534	--
Schizophrenia + K				1,312	.555	--
Hypomania + K				1,312	.080	--
Social Introversion				1,312	.674	--

*p < .05

Summary

This chapter reported the results of the statistical analysis of the data assessing the validity of the MMPI in differentiating between acceptable and unacceptable urban police applicants. It investigated the possibility that this psychological instrument could discriminate between acceptable and unacceptable male and female applicants. It also investigated whether or not

there were significant differences in the distribution of male and female applicants' MMPI scores.

Three discriminant analyses were performed: One for all acceptable and unacceptable urban police applicants; one for acceptable and unacceptable urban male police applicants; and one for acceptable and unacceptable urban female police applicants. Significant discriminant functions were found indicating that the proportion of variation explained by the three functions to be 15.72%, 16.03%, and 25.03% respectively. The respective correct classification percents were: 66.88%, 64.65%, and 71.55%.

A one-way multivariate analysis of variance investigated whether or not male and female urban police applicants' MMPI scores differed significantly. Wilks lambda was used as the global strength of association and indicated that 66% of the variation in the linear combination of psychopathology was accounted for by gender. Examination of the univariates indicated the significant differences to be on only two scales, depression and masculinity-femininity. Strength of association for depression was 1.54% and masculinity-femininity was 59.34%.

These results indicated that discriminant functions can increase the effectiveness of the MMPI greater than chance to distinguish between acceptable and unacceptable police applicants. The function accounting for the greatest increase was for female applicants with a classification rate of 71.55%.

CHAPTER V

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Introduction

In view of the critical importance of law enforcement in our society, the purpose of this study was to establish more valid and reliable objective psychological screening criteria of urban police applicants. Can the MMPI significantly differentiate between acceptable and unacceptable urban police applicants? The majority of previous MMPI studies relative to police applicants have focused on its effectiveness in selecting police applicants who will later prove to be successful officers. This study emphasized that the MMPI was originally designed to objectively detect psychopathology, not to select successful job applicants.

Previous studies have not included females due to insufficient numbers of available female applicants. This study collected and reported norms on both male and female applicants, while investigating whether there are significant personality differences between male and female applicants as measured by the MMPI. The value of this study was to assist in the identification of unacceptable police applicants.

Literature

An in-depth literature review presented the history, growth, and development of police applicant selection from 1829 to the present. While psychological assessment began in the early 1900s, the majority have occurred within the last 30 years. Screening and selecting applicants with the MMPI began shortly after its development in the 1940s and, although there are mixed

opinions regarding its use, it continues to be the most widely used objective psychological screening test today. It is required by law to be administered to all law enforcement officers in the state in which this study was conducted.

Two types of studies emerged: Those trying to predict who will prove to be successful and those screening for psychopathology. The review established a foundation for the need to establish the MMPI's validity in screening out unacceptable applicants.

Summary of Procedure

This study had two major parts. One for discriminating between acceptable and unacceptable applicants and one for assessing whether or not personality profile differences exist between males and females. It is important to note that while all applicants were required to complete the MMPI, none of the applicants who had been rejected because of their profile were included in this study.

The first part utilized a discriminant analysis with a correlational research design which had two levels of the independent variable employment classification: acceptable or unacceptable. The second part utilized a multivariate analysis of variance (MANOVA) with a causal-comparative design with two levels of the independent variable gender: male or female. The dependent variables were the thirteen MMPI scales. The probability level was set at $p < .05$.

Applicants were administered the MMPI in groups by a certified psychometrist with a masters and Ph.D. degree in applied behavioral sciences (counseling). The population consisted of 479 police applicants who applied over an eight-year period, 326 males and 153 females. Using SPSS-X random sampling, 198 subjects were selected from the males and 116 from the females.

Hypotheses and Conclusions

To test the MMPI's effectiveness to differentiate between acceptable and unacceptable applicants, three null hypotheses were formulated.

Ho₁ There are no significant discriminating clinical or validity MMPI scales on which acceptable and unacceptable urban police applicants differ.

On the basis of the stepwise discriminant function analysis comparing the two groups on the MMPI scales, the null hypothesis was rejected. It was concluded that a subset of these scales, when combined into a discriminant function, do differentiate to a significant degree between acceptable and unacceptable applicants, regardless of gender.

Membership in the unacceptable group appears to be most strongly associated with MMPI scales liescale ($r=.60$), psychopathic-deviate + K ($r=.60$), paranoia ($r=.42$), and hysteria ($r=.33$). Unacceptable applicants obtained higher mean scores on all discriminating variables than acceptable applicants. This construct implies that they may be more deliberately evasive, impulsive, suspicious, and to unconsciously convert psychological conflicts into physical illness when stressed. Although mean scores are so close as to render mean comparisons ineffective, their discriminant function accounts for 15.72% of proportion of variances. In the behavioral sciences, proportions of .10 to .25 are considered a small effect. Using the discriminant function to predict correct group membership of the sample was better than chance. It correctly classified 66.88%. At this time these results are tentative until further research is conducted to validate these results on applicants not in the sample. Future research should cross-validate these results.

Ho₂ There are no significant discriminating clinical or validity MMPI scales on which acceptable and unacceptable male urban police applicants differ.

On the basis of the stepwise discriminant function analysis comparing the two groups on the MMPI scales, the null hypotheses was rejected. It was concluded that a subset of these scales, when combined into a discriminant function, do differentiate to a significant degree between acceptable and unacceptable male urban police applicants.

Membership in the unacceptable male group appears to be most strongly associated with MMPI scales psychopathic-deviate + K ($r=.58$), liescale ($r=.51$), depression ($r=.36$), and paranoia ($r=.31$). Unacceptable applicants obtained higher mean scores on all discriminating variables than acceptable applicants. This construct implies the unacceptable males may be more impulsive, deliberately evasive, dissatisfied with comfort level, and tend to blame others for their difficulties. Although the mean scores are so close as to render their comparisons ineffective, their discriminant function accounted for 16.03% of proportion of variance. In the behavioral sciences, proportions of .10 to .25 are considered a small effect. Using the discriminant function to predict correct group membership of the same was better than chance. It correctly classified 64.65%. These results are tentative until further research is conducted to cross-validate these results on applicants not in the sample.

Ho₃ There are no significant discriminating clinical or validity MMPI scales on which acceptable and unacceptable female urban police applicants differ.

On the basis of the stepwise discriminant function analysis comparing the two groups on the MMPI scales, the null hypothesis was rejected. It was concluded that a subset of these scales, when combined into a discriminant function, do differentiate to a significant degree between acceptable and unacceptable female urban police applicants.

Membership in the unacceptable female group appears to be most strongly associated with MMPI scales liescale ($r=.54$), psychopathic-deviate + K ($r=.45$), paranoia ($r=.45$), and correction ($r=.41$). Unacceptable applicants obtained higher mean scores on all discriminating variables than acceptable applicants. This construct implies the unacceptable females to be more deliberately evasive, impulsive, suspicious, and defensive. Mean scores are separated further than any of the other groups (see Table 5). Their discriminant function accounted for 25.03% of proportion of variance. Effect sizes greater than .10 in the behavioral sciences (counseling) are considered significant and proportions greater than .25 but less than .40 are considered a moderate effect. Using the discriminant function to predict correct group membership of the sample was much better than chance. It correctly classified 71.55%. These results are tentative until further research is conducted to cross-validate these results on applicants not in the sample.

To test for possible differences between male and female police applicants based on their scores, the fourth null hypothesis was formulated and tested by a multivariate analysis of variance.

H_{04} There are no significant differences between male and female police applicants based on the distribution of their MMPI scores.

On the basis of the significant multivariate analysis of variance comparing the two groups, the fourth null hypothesis was rejected. It was concluded that significant differences based on applicant gender exist, however, their mean Depression scores were nearly identical, indicating neither group was depressed. Although male and female applicants' raw scores are significantly different, their respective T-scores indicate that males' mean scores indicate an average middle-class male vocational and avocational interest pattern. Females' mean scores indicate an average middle-class female vocational and avocational

interest pattern, reflecting that more feminine females apply than those with a masculine interest pattern. Significant masculinity-femininity scores were found with enough separation to identify the subject's gender. However, evaluators need no test to identify applicant gender.

Descriptively, all applicants had MMPI profiles within the MMPI norms indicating an emotionally healthy group. As previous researchers have reported, male police applicants have higher K, Pd, Ma and lower Si scores than MMPI normals. These results also found that female police applicants have higher K, Pd, Ma, and lower Si scores than MMPI normals. Police applicants are a very homogeneous group and their personality profiles are essentially the same regardless of gender. Overall, these results reflect that the department's screening strategies have accomplished an exceptionally good job and selected an emotionally acceptable group.

The conclusion that the MMPI is a valid and useful instrument to discriminate between acceptable and unacceptable applicants cannot be generalized without cross-validation with a different sample for this population. Also, these results cannot be generalized without replication in samples from different police departments. Police departments differ considerably in size, philosophy, and services delivered. Assessment must be specific for each department.

Recommendations

The three discriminant analyses formulated three significant functions. The first one formulated four scales that correctly classified 66.88% of the applicants: L, Pd + K, Pa, and Hy. The second one formulated four scales that correctly classified 64.65% of the male applicants: Pd + K, L, D, and Pa. The third one formulated four scales that correctly classified 71.55% of the female applicants: L, Pd + K, Pa, K. The multivariate strength of association measures

were 15.72%, 16.03%, and 25.03%, respectively. In the behavioral science area, these measures are considered significant having small to moderate, small to moderate and moderate effect sizes, respectively.

Based on the findings, the following recommendations for future research are made.

It is recommended that the MMPI continue to be utilized as a screening instrument. It is also recommended that future research in this population be directed towards utilizing these discriminant coefficients to classify new applicants after they have been classified as acceptable or unacceptable for employment. Comparisons could be made after a sufficient number have applied and correct classifications rates could be determined. Particular attention should be focused on the Liescale for all samples since it had the greatest effect in all three samples.

On the MANOVA for testing significant differences between male and female applicants, only depression and masculinity-femininity scales were significant. Mean Depression scores were almost identical and the amount of variability in the scores accounted for by gender was only 1.54%, too small of an effect to be useful. Although the masculinity-femininity scale had a strength of association of 59.34%, it is impractical for evaluators to use to differentiate between acceptable and unacceptable applicants. However, since no practical significant differences exist between male and female police applicant scores, future research should compare their results with these to determine if different sized populations have significant differences with greater variability between their scores.

While this study was unable to establish more useful screening criteria by observing mean differences, it yielded significant tentative discriminant functions that may be used for experimental purposes if they are cross-validated

and found reliable. Significant functions were found for all three groups with the greatest effect size (moderate) in the female group. This has significant implications for predicting acceptable and unacceptable employment classifications for female applicants. It implies that a different discriminant function should be used when considering gender, especially if they are female. These findings support the validity of the MMPI to discriminate between acceptable and unacceptable applicants regardless of gender, but are most accurate with the female sample. Future research should definitely attempt to cross-validate these results.

The study successfully collected and reported MMPI norms on both male and female urban police applicants. Additionally, it investigated whether female applicants presented the same MMPI profile and they did. This indicated that police applicant MMPI profiles do not differ because of gender. Both have profiles with the same shape and within normal limits.

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