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THE UNIVERSITY OF ALBERTA

APPLICATION DOCUMENTS AND PERFORMANCE RATINGS OF COMMUNITY POLICE

BY

© NORMA MARY FERGUSON

A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "Application Documents and Performance Ratings of Community Police" in partial fulfillment of the requirements for the degree of Master of Arts.

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ABSTRACT

The purpose of this study was to predict police performance from personal data contained in the application documents of the Edmonton City Police Department. Predictors were 63 personal factors selected from different documents. The criterion was an average score obtained from the job supervisor's statement about each policeman's performance, plus the supplementary comments of three other officers, as found on the Performance Rating and Review Form. The policemen were divided into three criterion performance groups, high-level, middle-level, and low-level.

The first hypothesis that these personal history factors can identify the high-level and low-level policemen was confirmed. Several predictors significantly differentiated between the two groups when considered independently. When all the predictors were combined multivariately they also significantly discriminated criterion groups.

The second hypothesis that by selecting the best predictors of job performance a predictive equation producing maximum discrimination could be produced was also supported. A selection method was proposed whereby the misclassification of high-level and low-level policemen could be greatly reduced. Classification of each future applicant could be made on the basis of a single discriminant score. This was an efficient and economical predictive instrument which could be readily used by the selection officers.

The two best single predictors of criterion performance were the interviewing officer's appraisal and the character investigation. High-level policemen were seen as more able to tolerate stress and conflict, and as less authoritarian than the low-level policemen.

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CHAPTER 1

INTRODUCTION

Police service is as good as its policemen. The problem has always been how to find good men to train. Law enforcement organizations are dependent upon their selection systems to find suitable men to employ. They tend to have a well-conceived picture of attributes and performance that make an effective policeman. The difficulty appears to lie in predicting these qualifications in the applicant wishing to enter the police profession. It is too often found that a police candidate, whose personality, abilities, and previous experience seem well qualified for police work, is later incapable of withstanding the pressures demanded of him (Chenowith, 1961).

The increasingly high requirements of policemen in performing their duties as peace-keepers and law-enforcers have been well described. Even 18 years ago Frost (1955) emphasized the pressing need by society for competent personnel to deal with the growing complexity of crime. More recently, Levy (1967) drew attention to the almost impossible demand on policemen to fulfill a dual and ambiguous role. She noted that they are expected to provide both support and control services, whereas most professions emphasize one or the other (e.g., physician, clergyman vs. military officer, warden). On one hand they are expected to overtly enforce all criminal laws, and on the other to covertly exercise selective

enforcement. Furthermore, they must have the ability to accept authority and command, as well as being able to act with initiative and authority in both crisis and routine. It has also been stated that policemen are required to understand political pressures and potential hazards that might erupt, and have the capacity to withstand these tensions in a bold, new visionary way (Brandstatter, 1968). Along these lines Mills (1972) comments on the rising demand from communities and from within the police profession for a "new breed".

Colarelli and Siegel (1964) state that the critical problems of selecting police candidates is one of the "thorniest, the most expensive, and the most time-consuming tasks facing police agencies." Blum (1964) claims that over 90% of the average law enforcement budget is allocated for the payment of police service salary. The appointment of an unfit person to the police force is always costly to the tax-payer.

In spite of the obvious importance of police selection the amount of research reported on the prediction of police career success has been comparatively small. Over the years, several methods and proposals for police selection have been outlined in an attempt to meet the ever-growing demand for men who can fulfill this uniquely complex and responsible position. The major questions have been which selection standards to use, and whether they actually distinguished between candidates who would become successful policemen from those who would not. Studies on evaluation of selection procedures and assessment of police performance have been sporadic, only

recently becoming more intensified. A review of the literature will be divided under two headings: Methods and Proposals; and Evaluation and Assessment.

Police Selection: Methods and Proposals

The first real municipal police force was organized in London, England in 1829 by an act of parliament, sponsored by Sir Robert Peel. The criterion for selection was a simple one: "men of good character background" were hired (Perkins, 1942). All officers had been hand-picked by a very careful system of selection: personal references, medical examination (both physical and mental qualifications), and interviews by an experienced personnel officer and two superior officers. Of the first 2800 men recruited into the organization at least 2238 (approximately 80%) had to be dismissed from the force (Chenowith, 1961). Today, one hundred and forty-five years later, the above procedure is still the basic examining method used by many police agencies.

The early Canadian model for police recruitment required the policeman to be of "sound constitution, able to ride, active and able-bodied, between the ages of 18 and 40 years (Smith, 1925). The first American criterion was based on this model in New York in 1844 (Perkins, 1942). Subsequently, while procedures varied, in general they were mainly concerned with physical attributes, experience, mental qualifications and personal character of the applicant.

Terman (1916) proposed the use of an intelligence test (Stanford Revision of the Binet-Simon) in selection of policemen and

firemen. Aside from moral integrity, Terman believed that intelligence was the most important factor in determining the fitness of an applicant for police work. He also employed educational achievement tests, medical examination, tests of physical strength and agility, and an interview in his selection program. It should be noted that the applicants he tested had a median age of 30, median education level of sixth or seventh grade, and a median IQ of 84. Recommended cut-off point was at an IQ of 80.

Vollmer (1921), Chief of the Police Department of Berkeley, California, proposed the addition of a special qualifying examination based on modified Army selection and screening techniques (including Army Alpha test). Qualifying criteria were broken into ten major areas: at least average intelligence, good physical condition; good nervous condition; good mental condition; personality characteristics; speed and accuracy; good visual and auditory memory; and good reasoning ability. Personality characteristics included the following factors: normal control of instincts and bodily activity; satisfactory disposition; good and desirable traits; recognized normal personal and social ideals; normal tastes; strength of character; and satisfactory temperament. There is no evidence in the literature of adoption and implementation of this proposed selection technique. While inadequate and over-optimistic it is unfortunate this method did not receive widespread notice and acceptance at the time as it appears consistent with today's selection objectives.

In 1942 Holmes published an article on an optimum program for police selection. He examined job functions and broke them down

into eleven traits required for effective police performance. They were:

> ...accurate memory and observation, reasoning ability, 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).

Also, in view of the complexity of police functions, he determined that they should be analyzed compositely ("integration of the performance of the work") rather than to consider individual traits separately. His proposed selection procedure consisted of eleven steps: personal interview; application form; intelligence test; personality inventory; knowledge tests; agility and strength; polygraph; medical examination; and probation period. He also recommended that efforts be undertaken to conduct research and evaluation programs to determine the effectiveness of the proposals by comparing programs to determine the effectiveness of the proposals by comparing scores with on-the-job criteria. He found little in the way of sympathetic audiences and police agencies continued to use "standard" methods.

Leonard (1950) and Wilson (1950) listed a series of eligibility requirements which they felt should be followed when selecting policemen. These requirements included age (21 to 31), height (5' 9" to 6' 4"), weight in proportion to height, character investigation, physical, neurological and psychiatric requirement, intelligence, and education (minimum of 12 years). Although selection criteria were minutely detailed, Wilson felt that extensive research by scientific and analytic techniques was needed to measure attributes

and evaluate their significance. He thought the primary problem to be solved was the selection and development of objective criteria to indicate the applicant's job performance value to the service. Without this the evaluation of any selection procedure was impossible.

Frost (1955), a member of the Chicago Police Department reviewed procedures and policies employed by 33 law enforcement agencies in their selection programs. Employing a 33 page questionnaire, he established a standardized compilation of their procedures, policies, and selection methods. Results were found to be essentially similar and were divided into five classifications: mental, physical, age, residency, and character requirements. He concluded that except for certain specialized positions in the police departments, the policemen with a college degree tend to become frustrated, particularly in areas of routine work. He did not recommend the use of psychological assessments or evaluations.

Dudycha (1955) vigorously supported the use of psychiatric examinations and personality testing to aid in detecting "difficulties" the recruit might be having. A stress interview was recommended. He emphasized the use of personality characteristics in rating scales. Although the trend was toward increasingly higher intelligence requirements he felt that selection on the basis of intelligence was not enough. Dudycha's sound proposal reflects increasing awareness at this time of the fact that more efficient and better evaluation techniques were possible and desirable.

Hammond (1960) declared that a good case could be made that present methods of selection were without foundations and that

research on selection procedures had been brought to a standstill. He claimed as Wilson (1950) had before him that without a criterion for evaluation, there is no way that one can demonstrate that present methods of recruiting actually work.

Police selection methods and proposals dating from 1829 have been presented. Scientific validation of selection programs was not included. Evaluation research, the dates of which overlap those of the above studies, will be discussed separately.

Police Selection: Evaluation and Assessment

Two main directions in assessment of police selection are apparent; the use of psychological testing, and investigation of background information (personal history).

Psychological Testing. Publications between 1957 and the present bear directly upon the hypothesis entertained by Dudycha introducing a new era in application of "advanced" psychological techniques in assessment and screening of police personality patterns. Since the concern of the present study is to predict police performance from personal history factors, a review of literature on the use of psychological testing will not be given here. Good reviews of literature in this latter area can be found elsewhere (McConnell, 1967; Gottesman, 1969; Mandel, 1970).

Personal History. The majority of studies reported in the literature indicate that personal or biographical data in general are of some value in predicting job performance (McConnell, 1967). An extensive survey by Doll (1968) traced the use of biographical

data back to Goldsmith (1922) who found personal history items valuable in identifying successful life-insurance salesmen. A massive amount of research has been done attempting to predict successful performance in various occupations using biographical information. Criteria included such things as turnover or survival, training school grades, creativity, research competency, and ratings.

Doll states that "cumulative evidence of the value of biographical information produced a consensus of opinion at a national research conference that such an approach is usually better than other techniques for predicting job performance" (p. 5). In support of this, Taylor, Ellison, and Tucker (1965) write "it appears that the potential value and promise of biographical information are now being recognized in many studies across very diverse criterion groups" (p. 98). Another valuable aspect is reported by Dunnette (1966) who claims that, since most factual biographical data can usually be checked by independent means it is much less likely to be faked. Taylor and Ellison's (1967) [illegible] supports the value of subjective information. They stated that [illegible] valid section of their biographical inventory was the adjit[illegible]elf-description, value preferences and interests, followed by [illegible]demic backgr[illegible]nd developmental history, and parents and fam[illegible]se[illegible]on.

Adams (1968) claimed that indus[illegible]ad[illegible]ide[illegible]e success in using personal history of the candida[illegible]e predictor of probable success on-the-job. He recommended the [illegible] of b[illegible]ogical data within the law enforcement field. This suggestion has practica[illegible] and economic merit in that most police organizations acquire this

information routinely for all applicants.

Rankin (1959) pointed out the richness of biological data in police selection:

> We are fortunate to have extensive background investigation available to us. They do an amazingly exhaustive investigation of the applicant's background for honesty, arrest records, educational attainment, work habits, personal traits, environmental stresses, and frank opinion of people who know the applicants well.... (p. 24)

An early validation study of personal history information in police selection was carried out by Martin (1923). Along with tests of mental traits and intelligence, he included the personal history factors of grade at leaving school, height, weight and age at appointment, height-weight ratio, war service credits, and previous occupations. His rationale for including these factors was that, though they might superficially appear non-pertinent to the inquiry, with statistical analysis they might contribute to the composite scores. The criterion was ratings secured from four commanding officers who had ample opportunity to observe and to get to know the men under their supervision. The men were rated from lowest to highest (5 points) on four scales: appearance, intelligence (judgment), discipline, and efficiency. Using multiple ratio correlations he established a composite predictor (12 variables) of the criterion. The eight mental tests yieled a cumulative multiple ratio coefficient of .74. By taking into account the four personal history factors, height, grade at leaving school, previous occupation, and weight, the index was raised to .80. He concluded these factors had very definite bearing in determining success as a policeman.

A sophisticated attempt was made by O'Rourke (1926) to standardize selection procedures. He developed partially standardized tests which included "practical knowledge" (questions pertaining to police problem solving), social and abstract intelligence, education and experience, personal traits, medical and physical qualifications, and character investigation. Eighty percent of the policemen scoring in the highest 25% on the test developed efficiency above average in on-the-job ratings.

Diehle (1933) carried out a survey of 124 Duluth policemen using, along with aptitude, personality and interests tests, personal history factors. It should be noted that this study employed mostly concurrent validity. Of relevance was the finding that, when the policemen were categorized into groups of Very Superior, Average, and Very Poor on the basis of supervisor's ratings of job performance, types of jobs held before employment were related to police efficiency. The three groups were not differentiated on country of birth, marital status, number of children, nor home ownership.

DuBois (1950) gave an extensive battery of tests to predict success of St. Louis patrolmen in training. The research was significant in that for the first time a reasonably large number (N = 129) was used, and full statistical treatment and objective criteria were introduced. He used four criteria of performance and knowledge: final grade in police academy; an achievement test based on Perkin's book Elementary Police Science; marksmanship during academy training; and service ratings by sergeants after ten weeks of duty. The predictors included a Police Aptitude Test which consisted of 90

multiple choice items divided into five sections: memory, spelling, reading comprehension, general information and judgment, and arithmetic. Results of inter-correlations between predictors and criteria revealed none of the tests was significantly correlated with rating of job performance. The Police Aptitude Test was a good predictor of achievement test scores, and Academy Grades. It was concluded that prediction of service ratings was dependent on personality predictors and that tests might have to be devised more accurately for actual on-the-job performance.

Mullineaux (1955) conducted a study screening 322 men by the AGCT and interview for the city of Baltimore. Fifty candidates were appointed as probationary patrolmen and sent to police academcy. AGCT correlations ranged from .46 to .73 with criteria (average spelling mark, report writing scores, final overall scores following training and final exam mark). Two series of ratings by the captain of the force were submitted at 3 and 6 months following completion of their academic training. No statistical results for this follow-up were presented, but ratings of ly satisfactory or above suggested fairly high validity of tests correlation with performance ratings.

Not until 1962 did interest revive in the identification of biographical factors in the selection process to be used as predictors of police success when Marsh undertook a study of 619 Los Angeles Deputy Sheriffs who had been recruited between 1947 and 1950. Predictors included civil service examinations, personality and interest tests, and biographical data compiled from each subject's

personal record. This included years of school completed and major subject, previous occupations, age at entry, and height. Criterion measures were ratings of job performance, discharge rate, accident rate, and tenure. Several predictors differentiated between high performance scorers and discharges, and between high and low performance scorers. Two of the General Ability Test items were the best predictor of success (sentence completion, and number series completion). The interview score alone was just less than a significant predictor, but was significant when weighted and combined with the written test. Taller subjects, 72" or more, were more successful. Those with police and fireman experience were less apt to be successful. High test scorers tended to have slightly lower tenure. The author felt that this disadvantage was offset by the superior job performance of these policemen.

McConnell (1967) attempted to employ personal history information to develop a selection instrument in the form of a weighted application blank to predict police success. Personal history data were obtained from application blanks filled out prior to employment and from a supplementary personal history questionnaire administered at the time of the investigation. Using performance ratings (10 traits) specially constructed for the research project, a summed performance rating score was obtained. Ninety-seven line patrolmen from four Colorado City police departments were divided into two groups, the upper 50% (successes), and the lower 50% (failures). One-third of the subjects of each of these groups were used for cross-validation purposes. A personal history score was also obtained. Results indicated there was a significant difference between

the total scores on personal history data of the patrolmen classified as successes and those classified as failures. The author points out the limitations of the predictive instrument due to firstly, using concurrent validity, and secondly, the fact that the policemen were already preselected for employment by earlier screening. Since further differentiation of these employees was possible it was concluded that this method measures something not previously accounted for by the preliminary selection procedures and could be a supplementary device to increase predictive accuracy.

A comprehensive study of life historical and demographic background characteristics of policemen was carried out by Levy (1967). From some 4,000 files of law enforcement officers who had been employed during the period 1952 to 1962 she selected those who had been separated (left the police force), matching them for years of hire with those who were still employed. Following elimination of some subjects there remained 2,666 police officers. The separated group was further divided equally into Failures (asked by department to leave) and Non-failures (voluntary departures). From the files were selected 40 "pre-employment" factors which were subjected to statistical analysis. The results indicated that certain background characteristics were significantly related to subsequent separations. Officers who were terminated for cause by the department were younger at time of appointment, had a greater number of years education, a greater number of marriages, more citations for vehicle code and other violations, more number of residences, and shorter work histories.

Cited as a fine validity study is that of Baehr, Furcon, and Froemel (1968) who did their research with the Chicago Police Department. Out of 2,327 patrolmen rated by the paired-comparison technique 490 officers were chosen, all of whom fell clearly in the top 33% or the bottom 33% third in field performance. These were further divided into two equal groups, the first a "primary validation sample" and the second a "cross-validation sample" to be tested 5 months after the first group. Among an extensive battery of written tests administered was a Personal History Index (PHI). From this index, fifteen factors were derived from 87 factorial items of information concerning family, education, and work history. It was found that the PHI predicted well to paired ratings. Early family responsiblity, and family and occupation stability appeared to be important in prediction of good patrolmen. The results of this study are an advance over the DuBois, and Watson (1950) study in which relationships were established between test scores and training academy performance, but not between scores and actual job performance. The disadvantages of using concurrent validity are applicable here.

Mandel (1970) did a predictive validity study of 114 patrolmen in Salt Lake City Police Department. Twenty-two of these men left before the study was conducted. From records and personal files she compiled background and current performance data gathered from 1963 to 1968. Predictors were 121 variables, 13 from the Minnesota Multiphasic Personality Inventory, and 105 from biographical data. These latter variables were grouped into 21 categories such as

"Preference for sports," "Specified occupational skills," etc. Forty-five criteria of job performance were selected. They included performance ratings (attendance, initiative, cooperation, job knowledge, emotional stability, appearance, dependability, attitude, quality and quantity of work, and average grade of the above ratings) and merit ratings (rank, accidents, citations, suspensions, absences, etc.). Results yielded many significant correlations. The items in the merit rati were found to be highly intercorrelated (.51 to .91), suggesting little independence. Biographical data obtained 208 significant correlations with the criterion. Those which had ten or more significant correlations with the criteria were as follows: previous occupational skills; reason for choosing police work as a career; court record; born outside of Utah; and number of major operations. Mandel concluded that the evidence provided an argument in favor of the superiority of biographical data over the MMPI for predicting job performance. Further analysis was deemed justifiable.

A follow-up study which does provide predictive validity was carried out by Furcon (1971). One of the objectives of this research was prediction of performance using the test procedure of the initial 1968 study in which prediction equations were established. Criterion measures selected were two supervisory ratings (paired-comparisons and routine bi-annual), as well as objective measures (Internal Investigation complaints, total awards, disciplinary actions, number of arrests, and absenteeism). Supervisory ratings were considered the most valid measure. It was verified that the psychological test battery had predictive validity over time for all

measures of performance. Items from the PHI which contributed to the prediction of paired-comparison ratings were as follows: lower liking for and achievement in school; higher scores on professional-successful parents, background pattern of father and comfortable home life, no sales experience, and good health. City Police Department ratings correlated highly with paired-comparison ratings, and its predictors had many common elements. The results present evidence of the utility of a number of personal history dimensions in predicting measures of police officer performance.

In order to demonstrate that certain tests are predictive of both training and field performance, Leiren, Kiker, and Phelan (1971) did a validation study of 121 deputy marshals chosen for the Academy Training Program. They correlated biographical data (53-item biographical questionnaire), achievement test scores, personality trait [illegible]s, with measures of training (scores in academic success), and [illegible]mance success (supervisory ratings and personal history). Both [illegible] predictors and the criteria were factor-analyzed. Multiple regression analysis was used to maximize predictive efficiency and for cross-validation purposes. Significant relationships were found between the predictor battery and each of the criteria. Absenteeism correlated negatively with one of the biographical items "number of younger siblings" suggesting persons with a larger number of younger siblings are more responsible. Supervisory ratings correlated positively with numerical and verbal reasoning, the Achievement Test, and Edwards Personal Preference Schedule. This was interpreted to mean that supervisors preferred persons who demonstrated reasoning

ability, are aggressively self-assured, and are production oriented. Number of automobile accidents was positively correlated with Vocabulary and Verbal Reasoning (the less intelligent had more automobile accidents). The composite Academy Training Score was the most predictive of all the criteria. Cross-validation consisted of dividing the sample into two random halves and each type of predictor analyzed separately against each criterion. All the predictors were then selected in either sample, combined, and analyzed again by stepwise multiple regression. The weighting coefficients developed in each sample were cross-validated in the other. Since the initial and predicted multiple correlations were both statistically significant the subsamples were recombined and the final weights for prediction of the composite academy scores were obtained. Biographical data were not included in the final regression equation.

In an effort to upgrade the quality of recruits, and to validate the selection and evaluation procedures, Spencer and Nichols (1971) undertook a research program on applicants for patrolmen in the Chicago Police Department. From an original group of 1,290 applicants who took the Civil Service Exam, 427 candidates were followed-up after four years. Predictors used were the Civil Service Exam, a biographical data sheet, Management Psychologists Inc. (MPI) rating based on a personal history form (includes personality as well as factual analysis) and a sentence completion test. There were two criteria selected for the study, failure to qualify (FTQ) on background investigation (initial screening process) and the department's performance ratings (best overall estimate of effectiveness).

Biographical data included age, education, military service, marital status, father's occupation, by whom reared, and race. The 109 men who failed to qualify on background investigation differed from those accepted in that they tended to have unfavorable MPI ratings, to have had low rank in previous military experience, to be older (and married), to have low education, and to have father in relatively low socio-economic occupations. Patrolmen with high performance ratings tended to have high MPI ratings, and high scores on the California Test of Mental Maturity. The pattern of correlations for the two criteria were quite similar. The overall effectiveness of the totality of selection procedures was indicated by the fact that in this study, over a four-year period, only 12 out of 280 patrolmen had left the force for any reason. The results of the multiple regression equations indicated that the MPI ratings made the largest contribution to the predictive power of the multiple correlations (.24 with FTQ, .18 with performance ratings). The importance of education was also emphasized. Those men with high school or more were less likely to fail to qualify. The performance rating difference expected between extreme groups (85.17 for applicants with Above Average MPI ratings and Education beyond high school vs. 82.7 for applicants with Poor MPI ratings with less than high school education) is 2.47, just under one standard deviation of the Performance Rating Scale.

As an outgrowth of her 1967 work, Levy (1971) carried out another study on 1,056 officers hired during the year of 1968 using the same 14 departments employed in the original study. The goals

of this research were to validate a predictive model of tenure based on the 1967 research. Three separate submodels were developed in which a recruit could be identified as having pre-employment factors resembling Currents (still on police force), Failures (requested to leave), or Non-Failures (left on own volition). The equations discriminated the Currents from the Failures and Non-Failures, the Failures from the Currents and Non-Failures, and the Non-Failures from the Currents and Failures. Eighteen empirically derived variables, plus 20 logically derived variables from pre-employment documents entered into the predictive equations (Appendix A). At the time of the study, 14 months after the first recruit was hired, 100 officers had terminated. Of these, 80 were considered as Failures, 13 considered as Non-Failures, and 7 were not classified. Of the 80 Failures, 43 were correctly predicted as Failures. The overall efficiency (correct classification) was 40%. When the Failures and Non-Failures were lumped together, 64 of the 80 terminations were correctly classified, resulting in an overall efficiency of 80%. When predicted and actual distributions of termination (Failures and Non-Failures) were tested for statistical significance she found $p \approx .001$ for the Logical ones based on the result of a χ^2 test. Based on her results she concluded that the Logically derived equation based on pre-employment factors can successfully predict which recruits will terminate after 2-14 months, and which ones will be Failures.

Cohen (1972) further emphasizes the importance of the use of biographical factors in police selection. He carried out an extensive

study involving comparison of background information with later job performance. Information as maintained in the police personal files was gathered on 1,915 officers appointed in the New York City Police Department in 1957, of whom 1,608 were still active members of the force in 1968 when most of the data were collected. The objective was to identify which attributes are related to effective and unsatisfactory police performance. Pre-employment variables fell into the following categories: race, age at appointment, family descriptors, occupational history, military history, personal history, and evaluation by the Police Department's background investigator. Among the performance measures were included termination of employment, career advancement, departmental awards and commendations, seven measures of disciplinary actions against officers, absenteeism, arrest activity and supervisory performance evaluations. Five patterns of performance were identified through factor analysis: termination, career advancement, departmental discipline problem, civilian complaints, and harassments. Using multiple regression analysis he identified the background characteristics which made the greatest contribution in explaining variations in performance among officers. Some of the more pertinent findings are included here. Prior history of disciplinary incidents in previous employment and military records were strong predictors of future disciplinary problems and misconduct. Men who had been arrested for non-violent crimes were less likely to be later charged with harassment of citizens. Men who had appeared in civil court were more likely to engage in harassment later (may reflect difficulty in getting along with people). Aspects of

background which might be thought to be negative but which were not found to be related to later performance were a larger number of debts, prior history of psychological disorders, and history of mental disorders in applicant's family. Other aspects found unrelated to performance were: father's occupation; number of residences; marital status and number of children; and number of summonses. He found that the background investigator's rating was fairly successful in judging later performance as a policeman. Low-rated candidates were less likely to be promoted than high-rated candidates, and they were more frequently disciplinary problems. Men with at least one year of college education who remained on the force were found to be very good performers. Men who obtained college degrees exhibited even better job performance.

In general, police performance profiles revealed that those most likely to be disciplinary problems were young at time of appointment, non-college graduates, had excessive summonses and debt, had employment disciplinary records, and poor background ratings. Those most likely to incur harassment charges had no prior history of arrest, had history of civil court appearances and had military disciplinary records. Cohen thought that the strongest predictors were those which reflected primary behavior and experience as observed over a period of time (employment, court appearances, education, and performance recruit academy). Measures derived from single incidents or written exams were not indicative of major patterns of bad performance.

Problem and Hypotheses

Assessment of the effectiveness of police selection methods have followed two main areas of study. Validation of the predictive power of psychological testing has received the primary emphasis. Investigation of biographical or personal data has been the other concern. The applied usefulness of psychological testing in police selection has not yet been demonstrated. Levy (1967) asserted that psychological testing and psychiatric interviews had not been scientifically proven to have better predictive value than other police selection techniques. Undesirables have been frequently accepted, their behavior at a later date being such that it was necessary to leave the force, by cause or voluntarily. One explanation she put forth to account for this phenomenon was that "donning a uniform and buckling a holster may bring about a change in self-image and subsequent behavior." Another relevant fact she considered was the reliance of psychological testing upon indices of general emotional health as predictors of police success. Emotional health may aid in screening out psychotics and others too ill to function, but it is not as effective in predicting success or failure in law enforcement. She suggests that it is emotional suitability we should be seeking. As an alternative method, Levy suggested "let the records speak." She hypothesized that the personality characteristics of unsuccessful law enforcement officers, as revealed in their personal files (biographical data) would identify the high-risk applicant prior to hire.

That changes occur as a result of experience as a policeman has been studied by Niederhoffer (1967). He noted cynicism, apathy,

depression, and distrust which are common to urban policemen. It may be as Rhead (1968) claimed that, "certain traits ordinarily considered to be pathological are essential ingredients of the personality structure of the 'normal' police officer."

Cohen (1972) stated that the results of studies validating the predictive power of psychological tests in police selection have often been negative, and varied from city to city. He also indicated the usefulness of background information, claiming as follows:

> The most powerful and consistent predictors have been derived not from written tests but from elements of candidates' prior personal history.... (p. v)

The necessity of identifying the "suitable" personality factors associated with later police success or failure has been shown to be essential. A reliable indication of such characteristics are patterns of behavior over a wide range of life situations, and over long periods of time. These patterns can be expected to persist in the future. It has been proposed that an important source of such information is the personal background history of police applicants. Attention has been drawn earlier to the richness of background information as present in police applicant's files (see p. 9, Rankin [1959]).

It is hypothesized that:

1. Personal history factors in the pre-employment documents of the Edmonton City Police Department can identify high-level and low-level policemen as defined by job performance.

2. Predictive equations consisting of a reduced number of

variables selected from the original set of personal history factors can be derived which will provide an efficient instrument for predicting those applicants who will make high-level and low-level policemen.

CHAPTER II

METHOD

The subjects of this research were two hundred and eighty-three (283) male constables employed by the City of Edmonton Police Department. Data were originally collected for 302 constables representing nine consecutive classes recruited during the four years dating from 1968 to 1971. Excluded from the study were five policewomen, and 14 probationary male recruits who left the police force before the annual performance rating. Details are given in Table 1. All remaining policemen had had at least one year of field experience and one performance appraisal by superior officers.

Personal and performance data were collected from the personnel files of each policeman. Personal data included such information as personal and developmental history, interview assessments, biographical and demographical items, and character investigation. These variables were used as predictors of future criterion performance as indicated by superior officers' appraisals.

The data were scored by two different experimenters, E1 and E2. The policemen had been ordered within each recruit class from highest to lowest according to their post-training marks. Alternate policemen's data were scored by the two investigators, E1 scoring the even numbers and E2 scoring the odd numbers.

Table 1

Source of Subjects

Class Number	Date Recruited	Number of Recruits	Deleted Constables		Policemen in Research
			Policewomen	No Ratings	
27	March 18, 1968	36	1	-	35
28	September 16, 1968	34	2	5	27
29	January 6, 1969	30	-	3	27
30	April 21, 1969	27	-	2	25
31	September 22, 1969	44	-	1	43
32	March 9, 1970	35	-	1	34
33	September 28, 1970	34	2	1	31
34	March 22, 1971	32	-	-	32
35	September 13, 1971	30	-	1	29
	TOTAL	302	5	14	283

Predictor Variables

Personal data were selected from six documents. Only items which could be assigned some measure were included. One hundred and forty-two (142) predictor variables were scored originally. Many of these had to be subsequently eliminated. The nature of the multivariate analyses employed in this study is such that variables representing a linear combination of some other variables could not be included. Either total scores or the component scores of a test may be used but not both. The 48 subitems of the Education Test were eliminated in favor of the total marks for the five areas of knowledge. Of the remaining 94 variables several were deleted because of missing data, duplication of information, or invariance (all policemen answered the same questions). The documents employed, and the 63 variables actually selected for analysis are described below, and are summarized in Table 2.

Application Questionnaire. This questionnaire was filled out by each police candidate at the time of application. Two different forms were employed interchangeably over the four-year period during which data were collected. The first form (Form I), which contained 71 questions (Appendix B), was gradually replaced by a more condensed form (Form II) with 43 questions (Appendix C). In this latter document, some Form I items were eliminated altogether, while others were subsumed together under a new single item. This made it difficult to find continuity in scoring. Some of the candidates had answered all the items while others had not. Following deletion of items for the reasons explained above, there remained in the study 36 items.

Table 2

Summary of Personal Data Selected from Pre-employment Documents

Set A Predictors		Item Number		Scoring	
No.	Description	Form I	Form II	Original	Modified
	Application Questionnaire:				
1	Number of arrests or summonses.	9	21	0 - n	0-1=0; 2-n=1
2	Do you wear glasses?	11	30	1 or 0	
3	Number of occupations for past 10 years.	14	36	0 - n	
4	What is your total indebtedness?	24	28	0 - n	
5	Have you knowledge of first aid?	42	25	1 or 0	
6	Can you swim?	43	25	0 - 4	
7	Have you any training in boxing?	44	25	1 or 0	
8	Have you any training in judo?	44	25	1 or 0	
9	Have you any knowledge of a foreign language?	45	31	1 or 0	
10	Have you ever been in a motor accident?	48	9	1 or 0	
11	Have you made any other applications at the present time?	52	24	1 or 0	
12	Number of years in active military service.	53A	23	0 - n	0=0; 1-n=1
13	Number of years in a police force.	53B	24	0 - n	0=0; 1-n=1
14	Do you belong to a Labor Organization?	70	27	1 or 0	

Table 2 (continued):

No.	Set A Predictors Description	Item Number	Scoring Original	Modified
	Applicant's Education Test			
15	Composition -			
	- contribution to society	10	0 - 7	6,7=3; 3-5=2; 0-2=1
16	- contribution to self	10	0 - 7	6,7=3; 3-5=2; 0-2=1
17	- suitable reasons for application	10	0 - 7	6,7=3; 3-5=2; 0-2=1
18	- number of errors	10	0 - 7	0,1=1; 2-7=0
19	Mathematics mark	1-6	0 - 20	
20	Language mark	7,8	0 - 20	
21	General Knowledge mark	9	0 - 20	
22	Composition (essay) mark	10	0 - 20	
23	Spelling mark	11	0 - 20	
	Applicant's Personal History Sheet			
24	Number of years education	-	10 - n	
25	Family background	-	1 - 5	1-3=1; 4,5=0
26	Military Reserves	-	1 - n	0=0; 1-n=1
27	Social adjustment	-	1 - 5	
28	Economic adjustment	-	1 - 5	
29	Health adjustment	-	1 - 5	
30	Appraisal (Interviewing Officer)	-	1 - 5	

Table 2 (continued):

Set A Predictors			Scoring	
No.	Description	Item Number	Original	Modified
	Personal History Form (Confidential)			
31	Number of addresses in past 10 years.	10	1 - n	
32	Have you ever been dismissed?	12	1 or 0	
33	Have you ever been convicted of an offence?	15	0 - n	0=0; 1-n=1
34	Are you a Canadian citizen?	18	1 or 0	
35	Number of siblings.	8	0 - n	
36	Rank among siblings.	8	1 - n	
37	Number of children.	8	0 - n	0=0; 1-n=1
	Mancard			
38	Age in years.	-	n	
39	Weight/Height ratio.	-	n	
40	Marital status.	-	1 or 2	
41	Character Investigation	-	1 - 5	

Table 2 (continued):

Set B Predictors		Item Number		Scoring	
No.	Description	Form I	Form II	Original	Modified
	Application Questionnaire				
42	Is your life insured?	20a		1 or 0	
43	Have you a savings account?	20b		1 or 0	
44	Have you investments in stocks and bonds?	20c		1 or 0	
45	Do you own your own home?	20d		1 or 0	
46	Number of charge accounts.	23		1 - n	0-1=0; 2-n=1
47	Have you ever financed buying a car?	25		1 or 0	
48	Do you smoke tobacco?	35		1 or 0	
49	Do you drink intoxicating liquor in moderation?	36		1 or 0	
50	Number of gambling games with which you are familiar.	37		0 to n	0=0; 1-n=1
51	Do you read much?	41		1 or 0	
52	Number of years driving.	46		0 to n	
53	Approximate mileage driven.	46		0 to n	
54	Can you operate a motorcycle?	47		1 or 0	
55	Can you operate a police radio?	50		1 or 0	
56	Can you operate a telephone switchboard?	50		1 or 0	
57	Have you held any positions in which you exercised authority?	51		1 - 5	4,5=0; 1-3=1
58	What experience have you had with firearms?	56		1 - 5	4,5=0; 1-3=1

Table 2 (continued):

Set B Predictors		Item Number		Scoring	
No.	Description	Form I	Form II	Original	Modified
59	Words-per-minute in typing.	60		0 - n	
60	Was studying easy for you?	64		1 or 0	
61	What prompted you to make application?	65		1 - 5	4,5=0; 1-3=1
62	Have you any special interests pertaining to police work?	66		1 - 5	4,5=0; 1-3=1
63	Have you any special training of value in police work?	67		1 - 5	4,5=0; 1-3=1

Fourteen (14) of these items appeared on both Form I and Form II. Thus, the total sample of 283 Ss had answered these questions. The remaining 22 items on Form I were answered by only a proportion of the total sample (100 Ss).

Analysis of the data required there be an equal number of Ss for each variable. To deal with the problem of the two different sample sizes, it was decided that the 22 Application Questionnaire variables with the smaller sample of 100 Ss would constitute a separate analysis. These variables were labelled Set B predictors. The 14 Application Questionnaire variables, which were answered by all 283 Ss, were analyzed together with the 27 other predictor variables in the study. These 41 variables involving the total sample were labelled Set A predictors. It was judged that it was statistically better to separate the variables in this manner in order to maintain as large a sample as possible for most of the variables, than to considerably reduce the sample size for the sake of analyzing all the variables together. The separate analysis of the Set B predictors was maintained as part of this study in order to determine the importance in predicting police performance of certain variables which had been eliminated in Form II of the Application Questionnaire.

Scoring of most of the items was simple and objective. The E either counted the number of responses (o-n), or scored a 1 for "yes" and a 0 for "no". Replies to variables 57, 58, 61, 62, and 63 (see Table 2) were assigned scores by the E based on a five-point scale as follows:

Score	Description
1	Excellent
2	Very Good
3	Good (Average)
7	Fair
5	Poor (none)

Applicant's Education Test. Suitable applicants wrote this two hour exam which covered five school-acquired fields of knowledge (Mathematics, Language, General Knowledge, Spelling, and Composition), and an essay on why the applicant wished to become a policeman (Appendix D). A score of 20 in each knowledge area could be achieved. As well as being scored by the Police Department, the Composition was scored by the E on four categories of content: contribution to society; contribution to self; suitable reasons for becoming a policeman; and number of errors. A possible 7 points could be scored in each category depending upon content emphasis as follows:

Contribution to Society

7 points - helping others, assistance to others
6 points - protection of society
5 points - law enforcement
4 points - deterrence and suppression of crime
3 points - arresting criminals
2 points - other
1 point - vague, undefined mention of above categories
0 point - no mention of above categories

Contribution to Self

7 points - development of self)
6 points - respect (self and others)) Career mentioned and
5 points - advancement and security) emphasized.
4 points - challenge and variety
3 points - keep fit
2 points - wearing a uniform
1 point - excitement, other
0 point - no mention of above categories

Suitable Reasons for Becoming a Policeman

7 points - rational and controlled approach to job situations
6 points - mentally alert
5 points - physically agile
4 points - respect for laws
3 points - understanding of changing laws
2 points - knowledge of self-defense; first aid and firearms
1 point - like people, get along with them, other
0 point - no mention

Errors

One point for each error:

- spelling mistakes
- incorrect use of grammar
- incorrect sentence structure
- lack of clarity and integration

Applicant's Personal History Sheet. This form serves as an outline for recording personal history information obtained during an interview of the applicant by a superior officer, usually the Staff Sergeant (Appendix E). Seven variables were used from this form. All variables except Military Reserves (26), which was scored only for number of years, and Educational Background (24) scored for years education, were assigned values by E on a five-point scale. Qualities associated with each variable are itemized in Appendix D. Scoring was based on the proportion of these qualities which were met as shown below:

Score	Description	Qualities Met
1	Excellent	all, plus special attributes
2	Very Good	all
3	Good (Average)	most (at least half)
4	Fair	some (less than half)
5	Poor	very few

In the Appraisal (variable 30) the interviewing officer usually made some reference to his overall impression of the potentiality of

the applicant. Scoring was largely influenced by this statement.

Personal History Form (Confidential). Seven items were selected from this form which was completed by the applicant (Appendix F). No subjective socring by the E was required. They were scored yes or no (1 or 0), or by counted listings (o-n).

Character Investigation. The police department carried out an extensive background investigation into the character of the applicant. They conducted interviews or corresponded with his family, previous employers, landlords and others who had been directly associated with him. To the report a single score on a 1 to 5 scale was assigned by the E based on the following:

Score	Description
1	special or exceptional qualities
2	very good qualities
3	good qualities (average)
4	minor detrimental qualities
5	seriously detrimental qualities

Mancard. This card (Appendix G), recording mainly vital statistics, is filled out by the Police Department using information extracted from other documents. Three variables (38-40) were recorded from this card.

Modification in Scoring

A check of the distribution of Ss revealed that some of the variables were not normally distributed (i.e., they were positively or negatively skewed). Since this condition could lead to artificially created differences among criterion groups these variables were recorded as a dichotomy or a trichotomy. Table 2 gives both

the original and the altered scores.

Criterion Variables

The Performance Rating and Review Form (Appendix H) consists of 16 attributes (items 1-12) rated on a six-point scale, plus summary statements made by the rater and other superior officers. The four summary statements, items 15-18, were chosen as criterion variables to identify police performance.

Item	Description
15	Narrative assessment by rater
16	Remarks of the NCO, I/C Branch
17	Remarks of the interviewing officer
18	Remarks of the officer, I/C Division

The narrative assessment was a statement by the job supervisor who had the closest contact with the constables. He gave his opinion of each constable's past and potential performance. The E assigned a score of 1 to 5 to this statement as described below:

Score	Performance	Description
1	Excellent	- leadership qualities displayed
2	Very Good	- potential for leadership, little or no supervision needed
3	Average	- good ability with no problems, leadership qualities not displayed, needs some supervision
4	Fair	- minor problem with probability of improvement, needs some supervision
5	Poor	- persistent problem with improvement questionable, needs much supervision

In many cases the supervising officer would actually use the above adjectives in describing the constable in question. An

assessment of Average was given for a description of a good policeman with no apparent problems, but who required some supervision. A Very Good rating indicated the patrolman displayed a capacity for developing into a superior policeman, had leadership potential, and required little supervision. An Excellent rating was given to patrolmen who already had displayed superior leadership behavior. If the rater mentioned a minor problem, but believed the patrolman would improve, a score of Fair was given. A Poor rating reflected a more persistent problem in which improvement was believed doubtful.

The remaining three statements made by separate officers represented concurrance or disagreement with the initial statement by the rater. If their assessment agreed in general with the first officer's comments a similar score was given. Any differences in opinion were scored according to the rating descriptions. The four assessment scores were then averaged to give a single criterion score.

The decision to use the above variables for identificatic of criterion performance groups was based on the belief that the assessment by superior officers who knew the constables, and had interaction with them, would be a good overall indicator of job performance. This choice was further supported by a factor analytic study of the Performance Rating and Review Form. A separate factor analysis was carried out on 15 of the 16 attributes plus the four summary statements for each of the four years (1969-1972) under study. The results are shown in Table 3. Three factors were found for each of the first three years (1968-69 to 1970-71), with a fourth factor appearing in the last year (1971-72). In each analysis the four summary statements

Table 3

Summary of the Factor Analyses of the Performance Rating and Review Form

Factor	Items	Assessment Year 1968-69 n=62	1969-70 n=157	1970-71 n=222	1971-72 n=283
I	Care of personal issue	.73	.73	.76	.71
	Discipline acceptance	.66	.66	.61	.69
	Loyalty	.65	.65	.76	.68
	Appearance	-	.59	.56	.63
	Conduct and deportment	.65	.65	.64	.60
	Cooperation	.67	.37	.42	-
	Public relations	.74	.54	.47	-
	Judgment	-	.45	-	-
	Dependability	.50	.49	-	.38
	Verbal communication	.48	-	-	-
II	Remarks of officer I/C Div.	.90	.87	.91	.89
	Remarks of interviewing officer	.87	.87	.91	.89
	Remarks of the N.C.O.	.87	.83	.91	.89
	Narrative assessment by rater	.84	.82	.88	.85
	Cooperation	.49	.37	-	-
	Written communication	.42	-	-	-
III	Quality of work	.73	.67	.73	.78
	Knowledge of work	.65	.80	.67	.75
	Written communication	.71	.73	.70	.71
	Quantity of work	.73	.71	.53	.70
	Verbal communication	.53	.58	.72	.70
	Judgment	.68	-	.70	.68
	Initiative	.62	.42	.70	.66
	Dependability	.56	-	-	.56
	Conduct and deportment	.48	-	-	-
	Public relations	-	-	.44	-
	Cooperation	-	-	.41	-
IV	Public relations	-	-	-	5
	Cooperation	-	-	-	1
	Verbal communication	-	-	-	.36

consistently loaded .8 or higher on a single factor dimension. The remaining 15 attributes all loaded on separate factors. This indicated that the job-supervisor and other superior officers all were assessing constables on different information in the summary statements than that found in the 16 performance attributes. Since the narrative assessment was corroborated by three other officers, all of whom were experienced in assessing men, it was concluded that for the intention of this research the four summary statements were the most valid.

The factor analytic study served a second purpose as a measure of consistency of performance ratings over years. Subjects had been accumulated over the four years (Table 1), and the number of annual ratings per constable could vary from one to four. If consistency could be established over years, any single year of annual ratings could be used as performance criterion. The separate factor analyses of the 20 performance variables for each of the four years produced similar factor structures. Three factors with loadings of .4 to .7 appeared for the first three years. On one of these factors two variables loaded progressively lower over the first three years until they split off and produced a fourth factor in the final year. This finding is consistent with expectations associated with increasing the number of subjects over years, thereby increasing the power of discrimination among factors. A coefficient of consistency was established of $\geq .9$ for all pairs of years using Program RELATE (Veldman, pp. 238-245, 1967). The final year of summary statements, which included the total accumulated number of subjects, was used

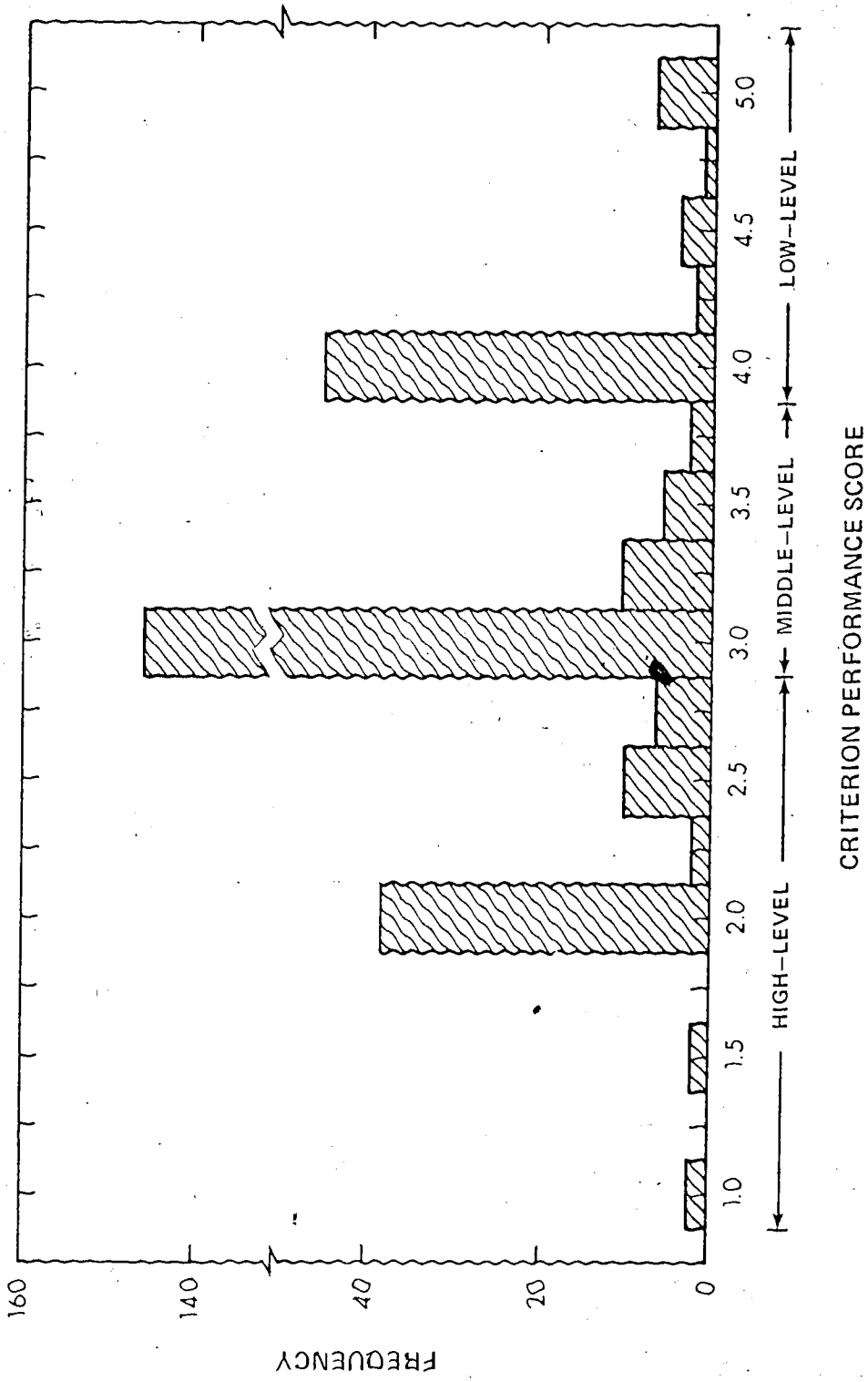
to define the criterion performance groups.

Criterion Performance Groups

A single average score was obtained from the ratings assigned by the E to the four summary statements on the 1971-72 Performance Rating and Review Form. The distribution of Ss on performance criterion score is given in Figure 1. Three criterion groups of constables labelled as high-level (HL), middle-level (ML), and low-level (LL) were chosen. The cut-off points selected for the upper and lower groups were necessarily a function of the distribution. The highest cut-off value that could be used was 21% since it represented the total number of constables whose criterion scores were better than average. If at least one of the component assessments of the single criterion was Very Good (score of 2) or Excellent (score of 1), the constable would fall into the HL group. At the other extreme a 21% cut-off resulted in a LL group of constables whose criterion scores were less than Average. All their assessments were Fair (score of 4) or Poor (Score of 5). The ML group consisted of those men who received at least one Average (score of 3) rating but no Very Good or Excellent assessment. The number of policemen assigned to each group according to the average criterion differentiation for Set A predictors were as follows:

FIGURE 1

DISTRIBUTION OF POLICEMEN ON THE CRITERION PERFORMANCE SCORE



Set A Predictors

Criterion Groups	No. of Ss	Percentage
High-level (HL)	59	21
Middle-level (ML)	165	58
Low-level (LL)	59	21
Total	283	100

For Set B predictors (100 Ss extracted from the total sample) the criterion assignment resulted in the following distribution:

Set B Predictors

Criterion Groups	No. of Ss	Percentage
High-level (HL)	21	21
Middle-level (ML)	54	54
Low-level (LL)	25	25
Total	100	100

Statistical Analysis

An overall correlation analysis (Program MAIN 181) was carried out on all the original variables, both predictor and criterion, which entered into this research. The data were then analyzed using two different computer programs. The first method was multiple discriminant analysis (Program MULV02), which results in a reduction of the multiple measurements to one or more weighted combinations having maximum potential for distinguishing among numbers of different groups. The second method involved a step-wise multiple discriminant analysis (Program BMD07M). At each step a new variable with the largest F value (ratio of between-group variance to within-group variance) is entered into the discriminating set of predictors. A classification matrix is output for each step, and changes of

classification of Ss into criterion groups can be observed as each variable is added to the set. Selection of the most important predictors can be facilitated by this method.

Inter-Rater Reliability. The data were scored by two different experimenters, E1 and E2. In order to control for any rater effects upon the analysis a statistical adjustment was first made. The differently rated Ss were divided into two groups. The scores for each S of these two groups were normalized with respect to their own means, then pooled, and rescaled. This step would have the effect of increasing the homogeneity of the distribution and decreasing the within-group variance. To influence the analyses in this direction was not considered detrimental since any significant discrimination among groups would be the result of a more conservative test of significance. Any differences could be more confidently assumed to be due to differences between groups than to a rater bias.

A comparison was then made using the Set A predictors by first including a rater variable in the multiple discriminant analysis, and then excluding it. The rater effect could thus be assessed.

Procedure. Analysis of the multivariate data required several steps to select from the original 63 variables those which contributed best to prediction of criterion performance. The goal was to establish which combination of variables would give maximum discrimination among groups.

The outline of the steps of the statistical procedure are as follows:

1. Multiple discriminant analysis of the original set of predictors. The purpose of this step was to determine the discriminating potential of all the original variables combined. This provided a base level of significance from which to compare the discriminating potential of selected subsets of variables. Scaled weights were also given which indicated the relative importance of each variable in predicting criterion performance.

2. Step-wise multiple discriminant analysis. This step gave information about each variable as it was added to the discriminant function, and its ability to reduce the errors of classification. Selection of several subsets composed of different combinations of variables was thus made which could then be tested for significance of discriminating potential.

3. Multiple discriminant analysis of selected subsets of predictors. Levels of significance were established for each subset by this step. This allowed comparison with the original set, and selection of best predictive equations. Weighting coefficients were also given which could be used for future prediction of police performance.

The nature of the analysis of data in this study was such that the results of each step must first be examined before proceeding to the next step. The results of the analytical procedure will be given in Chapter III. They will be summarized and discussed in relation to police selection in Chapter V.

CHAPTER III

RESULTS OF THE STATISTICAL ANALYSIS

Intercorrelations among all the original variables (predictor and criterion) entering into this study are found in Appendix I. A comparison of the multiple discriminant analysis of the Set A predictors with and without a rater variable included produced essentially similar results. The amount of variance accounted for by the two discriminant functions in each analysis was the same (DF I = 69%, DF II = 31%). For the analysis of the set with the rater variable the overall discrimination was not significant ($p = .17$); the first discriminant function was significant ($p = .009$), and the second was not ($p = .154$). When the rater variable was excluded the overall discrimination was also not significant ($p = .12$); the first discriminant function was significant ($p = .008$), and the second was not ($p = .154$). It was concluded that the rater effect was negligible and that inter-rater reliability had been satisfactorily established.

Set A and Set B predictors were scored on a different number of Ss ($n_A = 283$, $n_B = 100$). Separate analysis were required to deal with the different sample sizes. Results of the procedural steps will be reported separately for Set A and Set B predictors.

Set A Predictors

Multiple Discriminant Analysis. Table 4 gives the means and standard deviations of each predictor variable for the three criterion performance groups, high-level (HL), middle-level (ML), and

Table 4

Means and Standard Deviations of Set A Predictors

Predictor		Criterion Performance Groups		
No.	Description	High-level	Middle-level	Low-level
	Application Questionnaire			
1	Number of arrests	7.41(4.08)	7.27(4.14)	6.49(4.39)
2	Glasses	2.22(3.08)	2.26(3.12)	1.76(2.51)
3	Number of occupations	3.56(2.17)	4.06(2.08)	4.25(1.67)
4	Total indebtedness	1.19(1.62)	1.63(2.30)	2.32(4.12)
5	Knowledge of first-aid	5.88(4.48)	5.47(4.50)	5.58(4.50)
6	Swimming	7.25(4.14)	7.33(4.11)	7.25(4.14)
7	Boxing	1.92(2.72)	2.04(2.87)	2.98(3.73)
8	Judo	2.53(3.38)	2.25(3.12)	2.22(3.08)
9	Foreign language	2.98(3.73)	2.75(3.56)	2.53(3.38)
10	Motor accidents	5.42(4.50)	4.93(4.46)	5.42(4.50)
11	Other applications	1.76(2.51)	2.04(2.87)	2.22(3.08)
12	Military service	3.29(3.92)	2.69(3.52)	2.53(3.38)
13	Police Force	3.14(3.83)	2.25(3.12)	2.22(1.67)
14	Labor Organization	2.37(3.24)	2.86(3.64)	3.14(3.83)
	Applicant's Education Test			
15	Composition - contribution to society	1.75(0.73)	1.82(0.71)	1.91(0.74)
16	- contribution to self	2.00(0.61)	2.15(0.64)	2.18(0.62)
17	- suitable reasons	4.39(1.67)	3.80(1.78)	3.80( )
18	- number of errors	8.48(3.38)	7.71(3.92)	7.56(4.00)
19	Mathematics mark	13.39(3.96)	13.52(4.39)	12.6 (5.)
20	Language mark	15.12(1.90)	15.14(2.26)	15.54(1.70)
21	General Knowledge mark	15.61(2.71)	15.72(2.33)	14.90( )
22	Composition mark	14.15(2.28)	13.76(2.09)	13.54(2.12)
23	Spelling mark	14.15(3.32)	13.85(2.84)	14.29(2.77)
	Applicant's Personal History Sheet			
24	Years education	11.63(.97)	11.67(.99)	11.51(0.91)
25	Family background	8.32(3.51)	8.04(3.72)	7.25(4.14)
26	Reserves	5.12(4.48)	4.44(4.37)	4.66(4.42)
27	Social adjustment	3.10(.71)	3.38(.67)	3.34(.70)
28	Economic adjustment	3.20(.78)	3.32(.97)	3.54(.91)
29	Health adjustment	2.42(.56)	2.50(.69)	2.41(.61)
30	Appraisal	2.83(.69)	3.24(.90)	3.27(.84)

Table 4 (continued):

Predictor No.	Description	Criterion Performance Groups High-level	Middle-level	Low-level
	Personal History Form			
31	Number of addresses	4.22(2.44)	4.52(2.53)	4.29(2.51)
32	Dismissals	1.61(2.26)	2.09(2.94)	2.22(3.08)
33	Convictions	3.90(4.20)	3.67(4.11)	2.98(3.73)
34	Canadian citizenship	8.93(2.91)	8.91(2.94)	8.63(3.24)
35	Number of siblings	3.56(2.28)	3.00(2.03)	3.09(2.04)
36	Rank among siblings	2.66(1.80)	1.97(1.73)	2.41(1.52)
37	Number of children	4.05(4.26)	2.69(3.52)	3.14(3.83)
	Mancard			
38	Age (years)	23.12(3.23)	22.52(2.50)	22.48(2.72)
39	Marital status	6.34(4.42)	5.36(4.50)	5.12(4.48)
40	Weight/Height ratio	2.47(.50)	2.36(.48)	2.36(.48)
41	Character Investigation	2.54(.77)	2.75(.92)	2.81(.96)

low-level (LL). Two different analyses were carried out on the Set A predictors, one with the two extreme criterion performance groups (HL and LL), and the other with the three criterion performance groups (HL, ML, and LL). The two extreme groups were analyzed first to see if there were indeed any test variables which might be useful in predicting police performance. Structuring the sample in this manner would maximize chances of establishing significant relationships between predictors and criterion. The outstandingly good and poor performances of policemen are more easily identified than average performance. Analysis of the three groups was then undertaken since it was believed employing the total sample would result in more stable weights for the prediction equations. Tables 5, 6, and 7 show the results of these two analyses.

For the two extreme groups (HL and LL) the univariate probabilities, as shown in Table 5, associated with the F test for significance showed that eight predictors differentiated the groups at the .10 level or better. From the multivariate results (Table 6) it was seen that a single discriminant function significantly separated the HL and LL groups using an F modification of Wilk's lambda criterion ($F_{42,75} = 1.96$, $p < .006$). This established that several of the predictors were contributing well to the discrimination between the two extreme groups on at least one dimension.

Some changes in univariate probabilities were effected when the ML group was included in the analysis (see Table 5). Six of the above eight predictors which gave significant univariate differentiation for two extreme groups still did so for three groups. Other predictors separated three groups significantly but not two groups. This

Table 5

Summary of Multiple Discriminant Analyses of Set A Predictors

Predictor		Two Groups		Three Groups		
No.	Description	p	Scaled Weights	p	Scaled Weights I	Scaled Weights II
	Application Questionnaire					
1	Number of arrests	.25	-2.685	.41	6.561	-0.404
2	Glasses	.38	0.114	.55	1.111	-0.454
3	Number of occupations	.06	0.384	.16	-1.351	-2.946
4	Total Indebtedness	.05	2.417	.07	-6.321	1.573
5	Knowledge of first aid	.72	0.380	.84	-0.877	0.693
6	Swimming	.71	-0.098	.99	0.191	-1.319
7	Boxing	.08	1.678	.09	-3.104	4.498
8	Judo	.61	-0.785	.83	-1.603	-2.753
9	Foreign Language	.49	-0.376	.79	3.111	0.400
10	Motor accidents	.99	1.122	.66	0.146	1.617
11	Other applications	.38	4.294	.68	-4.635	1.013
12	Military service	.26	-7.863	.46	6.636	-0.798
13	Police Force	.16	-5.003	.18	4.884	1.127
14	Labor Organization	.25	2.003	.51	-2.868	-1.962
	Applicant's Education Test					
15	Composition - contribution to society	.26	-0.514	.50	-0.621	0.902
16	- contribution to self	.31	0.514	.58	-0.738	1.793
17	- suitable reasons	.09	-2.111	.09	7.105	2.136
18	- number of errors	.19	-1.836	.35	2.601	3.295
19	Mathematics mark	.39	-2.042	.45	0.869	-1.123
20	Language mark	.21	4.529	.41	-5.378	2.808
21	General Knowledge mark	.13	-3.089	.08	3.212	-5.758
22	Composition mark	.14	-0.777	.29	1.176	-1.043
23	Spelling mark	.81	0.236	.56	-0.581	1.760
	Applicant's Personal History Sheet					
24	Years education	.50	-2.037	.54	3.582	-2.399
25	Family background	.14	0.915	.27	0.183	-4.377
26	Reserves	.58	6.088	.60	-4.171	2.009
27	Social adjustment	.07	0.358	.03	-1.095	-6.836
28	Economic adjustment	.03	0.819	.12	-1.564	4.562
29	Health adjustment	.88	-1.658	.58	1.226	-3.896
30	Appraisal	.003	3.655	.004	-4.954	-2.279

Table 5 (continued)

Predictor		Two Groups		Three Groups		
No.	Description	p	Scaled Weights	p	Scaled Weights I	II
	Personal History Form					
31	Number of addresses	.88	2.567	.69	-3.310	-2.659
32	Dismissals	.23	2.181	.45	-4.225	-1.883
33	Convictions	.22	-0.538	.43	4.026	-2.327
34	Citizenship	.59	-0.745	.81	4.160	-0.049
35	Number of siblings	.24	4.098	.21	0.677	-0.122
36	Rank among siblings	.41	-4.275	.02	2.876	7.448
37	Number of children	.23	-0.733	.06	3.822	5.691
	Mancard					
38	Age	.25	0.162	.31	0.970	-1.683
39	Marital status	.14	-2.221	.27	1.269	-1.362
40	Weight/Height ratio	.19	0.037	.29	0.349	3.629
41	Character Investigation	.002	4.419	.006	-7.651	3.183

Table 6

Discriminant Score Means and Standard Deviations for Two Criterion Performance Groups (Set A Predictors)

Groups	Discriminant Function
High-level	0.116(0.549)
Middle-level	1.639(0.511)

$F = 1.96$, $df_1 = 42$, $df_2 = 75$, $p < .006$

Discriminant Function (100% of variance)

$\chi^2 = 71.01$, $df = 42$, $p = .003$

Table 7

Discriminant Score Means and Standard Deviations for Three Criterion Performance Groups (Set A Predictors)

Groups	Discriminant Function I	Discriminant Function II
High-level	2.27(1.03)	3.13(0.97)
Middle-level	1.19(1.26)	3.74(0.72)
Low-level	0.41(1.56)	3.46(1.18)

$F = 1.21$, $df_1 = 82$, $df_2 = 480$, $p = .116$

Discriminant Function I (69% of the variance)

$\chi^2 = 66.26$, $df = 42$, $p = .008$

Discriminant Function II (31% of the variance)

$\chi^2 = 31.84$, $df = 40$, $p = .15$

suggests that for certain variables the ML group was not differentiated from either the HL or the LL groups. For three groups two discriminant functions (I and II) were output, each of which separated groups on a different independent dimension. The discriminant score means for each of these two functions are shown in Table 7. The first discriminant function accounted for 69% of the variance. It discriminated the three groups significantly ($\chi^2_{42} = 66.26$, $p = .008$), producing discriminant scores more different than by chance. The second discriminant function, accounting for the remaining 31% of the variance, did not significantly discriminate groups ($\chi^2_{40} = 31.84$, $p = .15$). The overall discrimination (the two discriminant functions considered together) of groups was not significant ($F_{82,480} = 1.21$, $p = .116$). These findings are represented graphically in Figure 2 which demonstrates spatially the discriminant score means (centroids) when plotted on the two discriminant function dimensions. It can be observed that Set A predictors separated the three groups well on the first discriminant function but not on the second.

The scaled weights recorded in Table 5 indicate the relative contribution of each variable to the discriminant functions. Based on the absolute value of the scaled weights the predictors were divided into three categories defined as high, moderate, or low contributors to the discriminant functions as shown in Table 8. This is a tentative classification to provide some convenience in future discussions of the large number of variables.

Frequency distributions of HL and LL group discriminant scores are represented graphically in Figure 3. Information about mis-

FIGURE
DISCRIMINANT SCORE (CENTROIDS)
OF CRITERION PERFORMANCE GROUPS FOR
SET A PREDICTORS

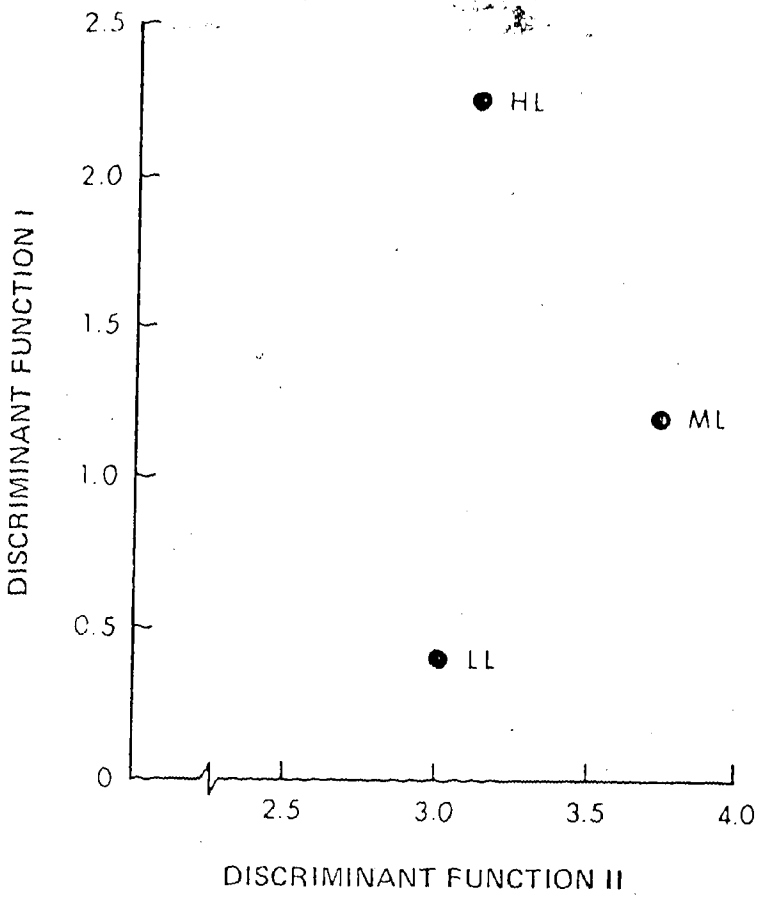


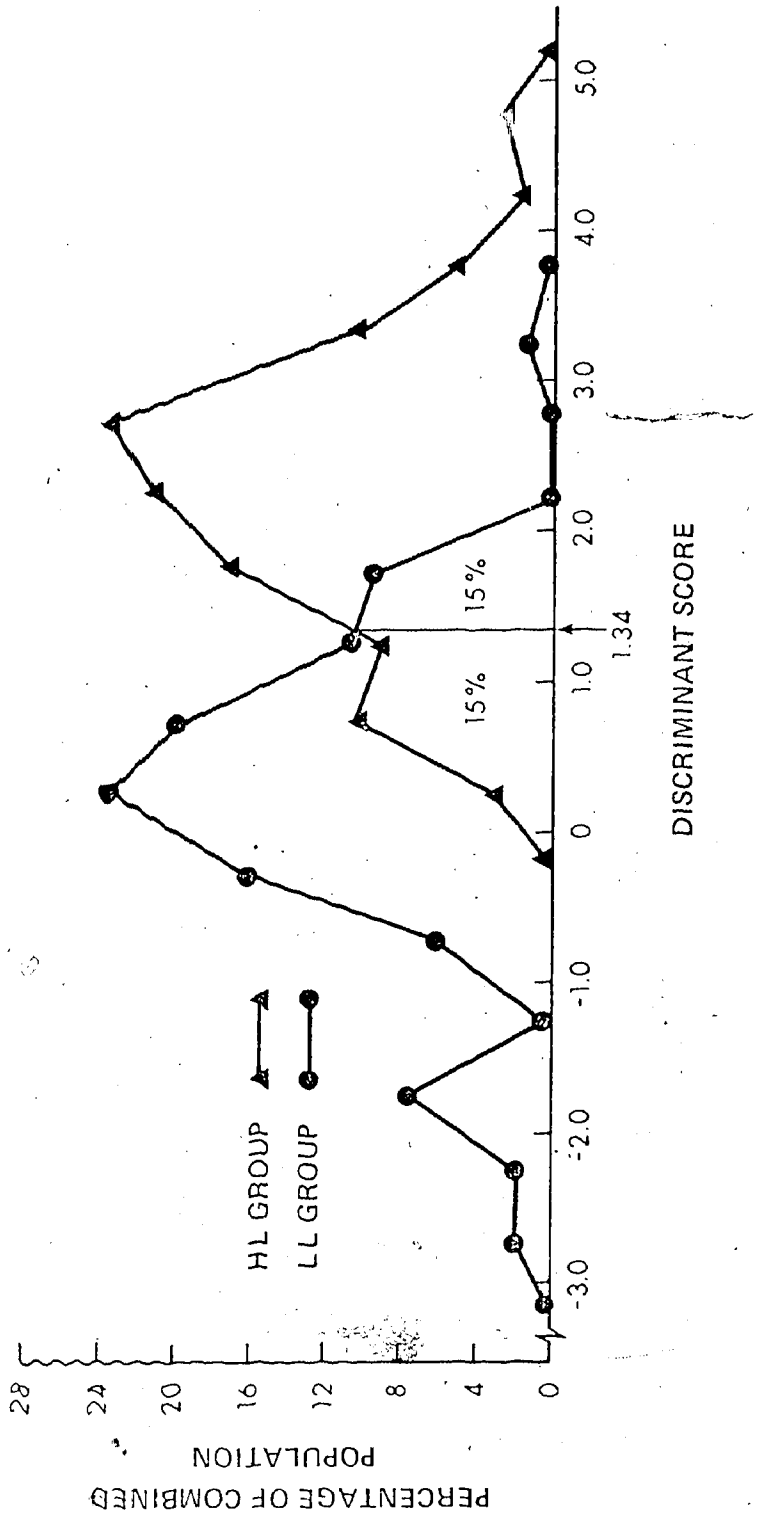
Table 8

Contribution of Set A Predictors to Discrimination of Groups

Categories of Scaled Weights					
No.	High (7.75 - 5.17)	No.	Moderate (5.16 - 2.58)	No.	Low (2.57 - 0.0)
41	Character Investigation	13	Police force	8	Judo
12	Military service	11	Other applications	22	Composition mark
36	Rank among siblings	33	Number of convictions	23	Spelling mark
1	Number of arrests	24	Years education	3	Number of occupations
4	Total indebtedness	26	Reserves	38	Age
27	Social adjustment	16	Composition -contribution to self	10	Motor accidents
17	Composition -suitable reasons	28	Economic adjustment	2	Glasses
30	Interviewer's appraisal	25	Family background	40	Marital status
21	General Knowledge mark	7	Boxing	19	Mathematics mark
20	Language mark	39	Weight/height ratio	6	Swimming
37	Number of children	31	Number of addresses	5	First-aid
		34	Canadian citizenship	35	Number of siblings
		32	Dismissals		
		9	Foreign language		
		18	Composition - number of errors		
		14	Labor organization - contribution to society		
		29	Health adjustment		

FIGURE 3

FREQUENCY DISTRIBUTION OF DISCRIMINANT SCORES FOR SET A PREDICTORS



classification of HL and LL Ss is more important than misclassification of ML Ss. From examination of the two sampling distributions it appeared that assumptions of normality and equal variances were reasonably satisfied. If a cutting point of 1.34 is used mid-way between the two sample means on the discriminant score dimension, an equal percentage of Ss (15% from each group) were misclassified. The total probability of error was .15.

Step-Wise Multiple Discriminant Analysis. A classification matrix of predicted and actual criterion performance was output at each step as one of the Set A predictors was added to the discriminating set. Only the percentage correct classification (i.e., percentage of actual group prediction) of Ss into criterion performance groups are shown here in Table 9. The overall efficiency (percentage hits from the total population) was also calculated. Except for Steps 3 to 6, all χ^2 distributions for each group were significant at the .05 level or better. The first variable (30) to be entered correctly classified 86% of the HL Ss and 45% of the LL Ss as they should be. Fourteen percent of HL Ss were misclassified as LL, and 55% of the LL Ss were misclassified as HL. The ML Ss were all misclassified as HL (65%) or LL (35%). The second variable (41) increased the correct classification of the LL Ss. Not until the inclusion of six variables were the ML Ss classified correctly better than chance. Addition of the remaining variables resulted in a gradual overall increase in correct classification for all three groups up to Step 27. At this point all three correct classifications reached the most equivalently high level (HL = 69%, ML = 54%, LL = 66%), with an overall efficiency of 60%. Addition of the 14

Table 9

Summary of Step-wise Discriminant Analysis of Set A Predictors Showing Percentage Correct Classification

Step	Predictor No.	Predictor Description	Group HL	Group ML	Group LL	Percentage Overall Efficiency
1	30	Interviewer's appraisal	86***	0***	45***	27
2	41	Character Investigation	61***	6***	71***	31
3	36	Rank among siblings	54***	38 n.s.	33 n.s.	43
4	21	General Knowledge mark	51 n.s.	40 n.s.	52 n.s.	43
5	17	Composition - suitable reasons	54***	41 n.s.	50 n.s.	43
6	1	Number of arrests	63***	47***	53 n.s.	43
7	4	Total indebtedness	65***	46***	55***	52
8	20	Language mark	64	45	57	52
9	27	Social adjustment	61	43	55	50
10	37	Number of children	63	48	55	53
11	7	Boxing	63	50	60	56
12	13	Police force	63	47	57	54
13	31	Number of addresses	66	49	57	52
14	5	Family background	66	52	57	52
15	32	Dismissals	66	51	57	52
16	29	Health adjustment	63	48	64	54
17	14	Labor organization	65	47	60	55
18	16	Composition - contribution to society	65	47	60	55
19	18	Composition - number of errors	66	47	59	54
20	9	Foreign language	71	47	64	55

Table 9 (continued):

Predictor			Group			Percentage Overall Efficiency
Step	No.	Description	HL	ML	LL	
21	33	Number of convictions	66	50	64	56
22	34	Canadian citizenship	70	50	62	57
23	11	Other applications	70	50	64	57
24	28	Economic adjustment	70	50	62	56
25	15	Composition - contribution to society	69	49	64	56
26	24	Years education	69	50	66	57
27	12	Military service	69	54	66	60
28	26	Reserves	68	50	64	56
29	2	Glasses	69	52	66	58
30	8	Judo	69	53	64	58
31	39	Weight/height ratio	71	50	66	58
32	3	Number of occupations	71	50	66	57
33	23	Spelling mark	70	52	62	57
34	22	Composition mark	69	52	64	58
35	10	Motor accidents	69	51	62	58
36	38	Age	69	48	64	56
37	6	Swimming	71	48	62	55
38	35	Number of siblings	71	48	62	55
39	40	Marital status	-	-	-	-
40	5	First-aid	-	-	-	-
41	19	Mathematics mark	71***	49***	59***	57

x^2 significance *** $p < .01$
** $p < .05$
* $p < .10$
n.s. = non-significance

variables after this step decreased the error classification only slightly for the HL group, and increased considerably for the ML and LL groups (71%, 49%, and 59%, respectively).

From the classification matrix output for each variable the percentage of Ss predicted to be HL, ML, and LL, and the percentage of actual classification of Ss within each of these groups, were calculated. The percentage classification of the total population was also found. Table 10 gives these classification percentages for those steps which are most representative in summarizing the changes in classification. The expected correct percentage classification of all Ss into criterion performance groups ($n_{HL} = 59$; $n_{ML} = 165$; $n_{LL} = 59$) would be in the ratio of 21:58:21, respectively. The closest approach to this was achieved at Steps 11 and 27, each with a ratio of 30:40:30. Step 27 was slightly better than Step 11 in producing an overall efficiency in classification (60% as opposed to 55% hits), as shown in Table 9.

From the above findings several combinations and permutations of the predictors were selected according to the ability of each predictor to reduce the errors of classification when added to the discriminating set. Separate step-wise discriminant analyses were then done on each of these subsets. It was found that the two subsets containing the 27 and 11 predictors as discussed above, resulted in the most accurate classification of Ss. These predictors were designated as Subset 1 and Subset 2, respectively. The predictors in Subset 1 subsume those of Subset 2.

It should be noted here that Subset 2 with 11 predictors (the

Table 10

Summary of Actual and Predicted Classification of Policemen into Criterion Performance Groups (Set A Predictors)

Step	Actual	Percentage of Subjects Classified into Groups: Predicted HL	ML	LL	Percentage of Total Population Classified into Groups: Predicted HL	ML	LL
1	HL	27	0	09	18	0	3
	ML	56	0	63	38	0	21
	LL	17	0	28	11	0	9
	Total	100	0	100	67	0	33
2	HL	35	8	13	13	0	8
	ML	50	84	62	18	4	36
	LL	15	8	25	6	0	15
	Total	100	100	100	37	4	59
3	HL	33	19	9	11	7	3
	ML	50	64	63	17	22	19
	LL	17	17	28	6	6	9
	Total	100	100	100	34	35	31
11*	HL	44	12	10	13	5	3
	ML	47	75	49	14	30	15
	LL	9	13	41	3	5	12
	Total	100	100	100	30	40	30
27*	HL	48	10	8	15	3	2
	ML	44	79	47	13	32	14
	LL	8	11	45	2	5	14
	Total	100	100	100	30	1	30
41	HL	47	10	8	15	4	2
	ML	44	75	52	14	28	16
	LL	9	15	40	3	6	12
	Total	100	100	100	32	38	30

* least error classification of HL and LL policemen.

earliest to be added to the discriminating set) all had a significant F value (ratio of between groups variance to between groups variance) to enter (at least $F \approx 3.49$, $p < .05$)., Nine of these 11 variables also had significant univariate differences of .10 or better between means (see Table 5). That is to say, they each by themselves differentiated the criterion performance groups. Furthermore, this subset of predictors included 10 of the 11 variables categorized as high contributors to prediction according to their scaled weights as was stated in Table 8. The 11th high contributor was added at Step 27 into Subset 1. Most of the high and moderate contributors were included in Subset 1 (27 predictors).

Multiple Discriminant Analysis of Predictor Subsets. This analysis established statistical significances of discrimination, and the weights for the predictive equations composed of the two selected subsets of predictors. Discriminant score means and standard deviations are shown in Table 11.

For Subset 1 (27 variables) the two discriminant functions together significantly separated the three criterion groups ($F_{54,506} = 1.74$, $p = .001$). Discriminant function I significantly accounted for 73% of the variance ($\chi^2_{28} = 65.27$, $p < .01$). Discriminant fuction II, accounting for the remaining 27% of the variance, was not significant ($\chi^2_{26} = 26.02$, $p < .50$).

For Subset 2 (11 variables) the two discriminant functions together significantly separated groups better ($F_{22,538} = 2.79$, $p < .00003$) than for Subset 1. Only the first discriminant function significantly differentiated groups ($\chi^2_{12} = 41.40$, $p < .01$). Both the

Table 11

Discriminant Score Means and Standard Deviations
for Selected Subsets of Set A Predictors

	Discriminant Function					
	I			II		
	Criterion Groups			Criterion Groups		
Predictors	HL	ML	LL	HL	ML	LL
Subset 1	0.52(0.16)	0.17(0.20)	-0.20(0.23)	-0.69(0.15)	-0.93(0.12)	-0.79(0.16)
Subset 2	2.97(1.27)	3.82(1.50)	4.49(1.67)	-0.46(2.95)	-1.22(2.26)	-0.34(2.47)

Subset 1

$F = 1.74$, $df_1 = 54$, $df_2 = 506$, $p = .001$

Discriminant Function I (73% of the variance)

$\chi^2 = 65.27$, $df = 28$, $p < .01$

Discriminant Function II (27% of the variance)

$\chi^2 = 26.82$, $df = 26$, $p < .50$

Subset 2

$F = 2.79$, $df_1 = 22$, $df_2 = 538$, $p = .00003$

Discriminant Function II (71% of the variance)

$\chi^2 = 43.40$, $df = 12$, $p < .01$

Discriminant Function II (29% of the variance)

$\chi^2 = 18.03$, $df = 10$, $p < .10$

selected Subsets 1 and 2 discriminated criterion groups better than the original of 41 predictors ($F_{82,480} = 1.21$, $p = .12$) as was found in Table 7. Figures 4 and 5 represent graphically the discrimination of groups for the selected Subsets 1 and 2. Again it was seen that the criterion performance groups were better separated on the first discriminant function than on the second.

Frequency distributions of the selected Subsets 1 and 2 with their cutting-points established mid-way between the HL and LL groups are represented graphically in Figures 6 and 7, respectively. The assumptions of normal distribution and equal variance are still as reasonably well met for Subset 1 as they were for the original set of predictors. For Subset 2 these assumptions are not as well met but are still applicable. When compared with the frequency distribution of the original set of predictors (Figure 3) changes in error classification were apparent. For Subset 1 the percent misclassification of the HL Ss increased slightly from 15% for the original set of predictors to 17%; the percent misclassification of LL Ss remained the same at 15%; and the percent error classification for the total population increased minimally from 15% to 16%. For Subset 2 the percent error classification for the total population was increased higher to 22% (misclassification of 20% of HL and 24% of LL Ss). These findings further support the earlier conclusion that Subset 1 with 27 variables was a more optimum combination for prediction of criterion performance than Subset 2 with 11 variables.

Set B Predictors

Multiple Discriminant Analysis. As was done for the Set A

FIGURE 4
DISCRIMINANT SCORE MEANS (CENTROIDS) FOR SELECTED SUBSET 1 (SET A PREDICTORS)

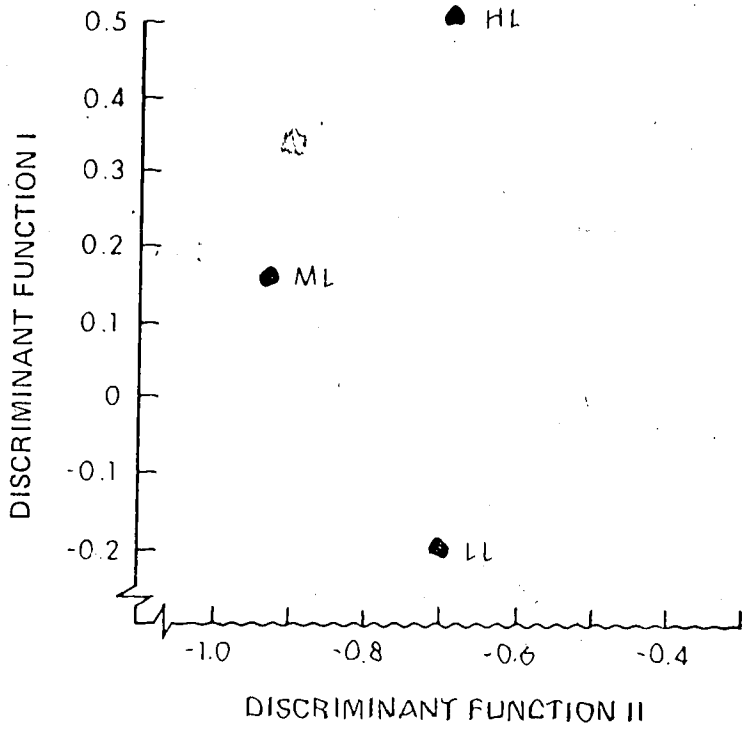


FIGURE 5
DISCRIMINANT SCORE MEANS (CENTROIDS) FOR SELECTED SUBSET 2 (SET A PREDICTORS)

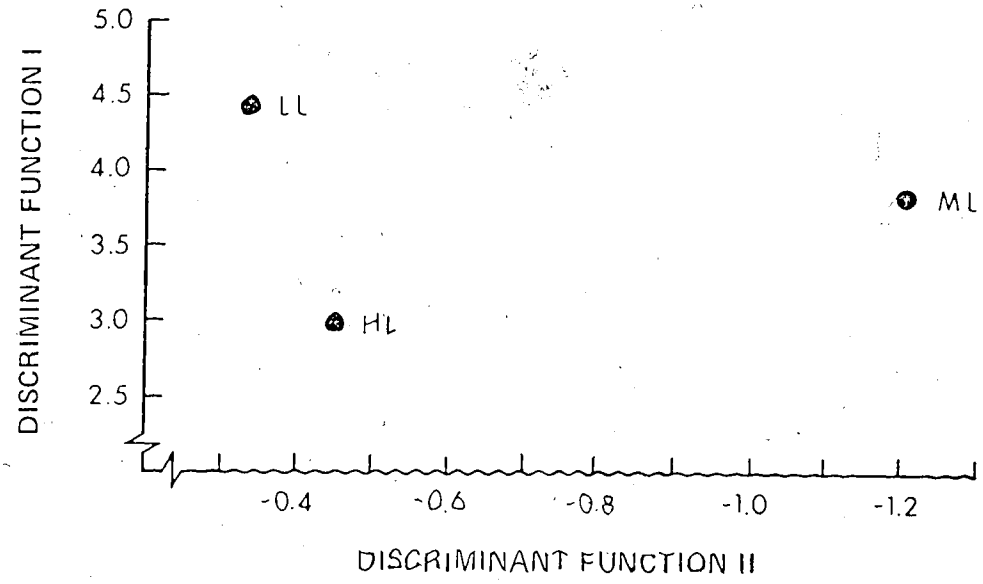


FIGURE 6
FREQUENCY DISTRIBUTION OF DISCRIMINANT SCORES FOR SELECTED SUBSET (
(SET A PREDICTORS)

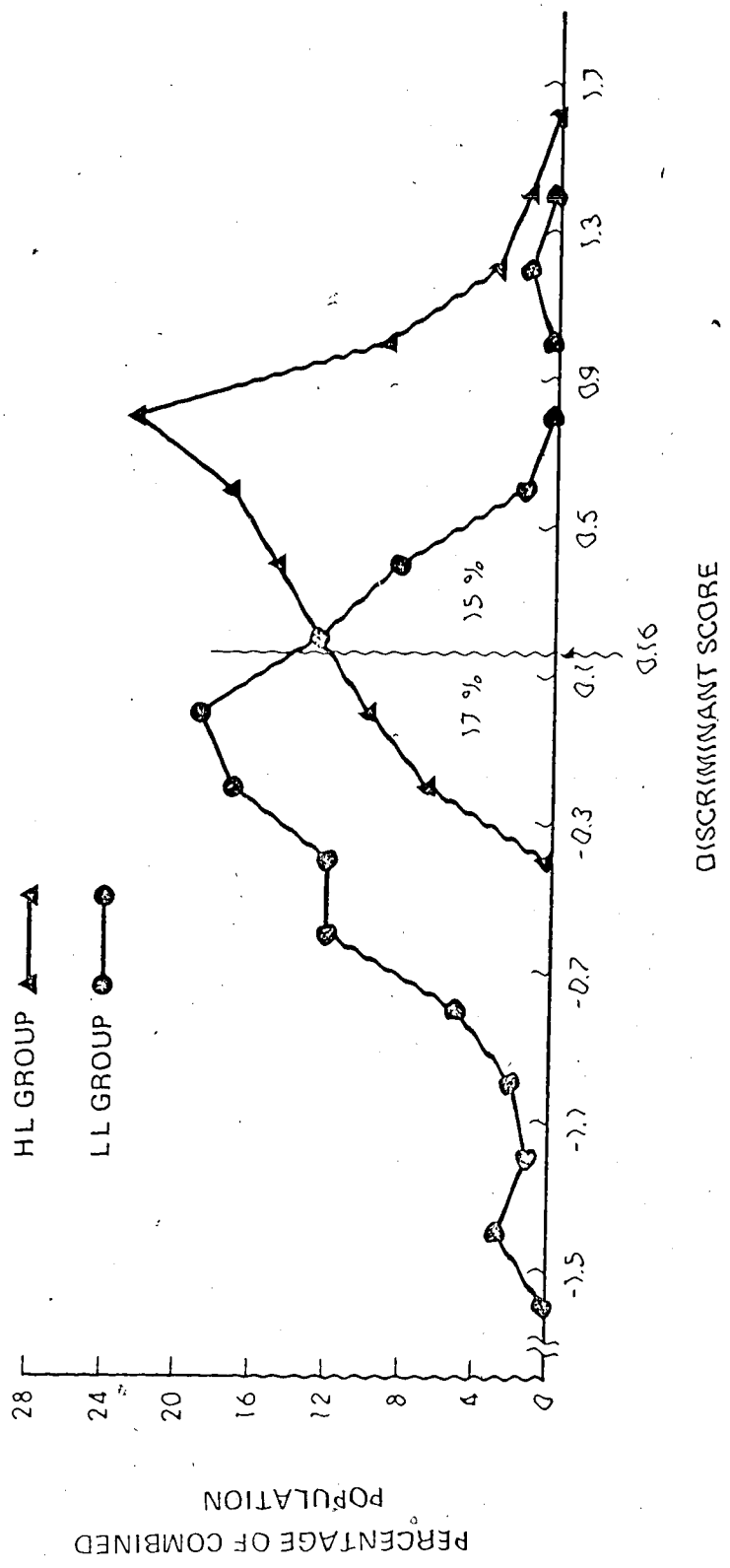
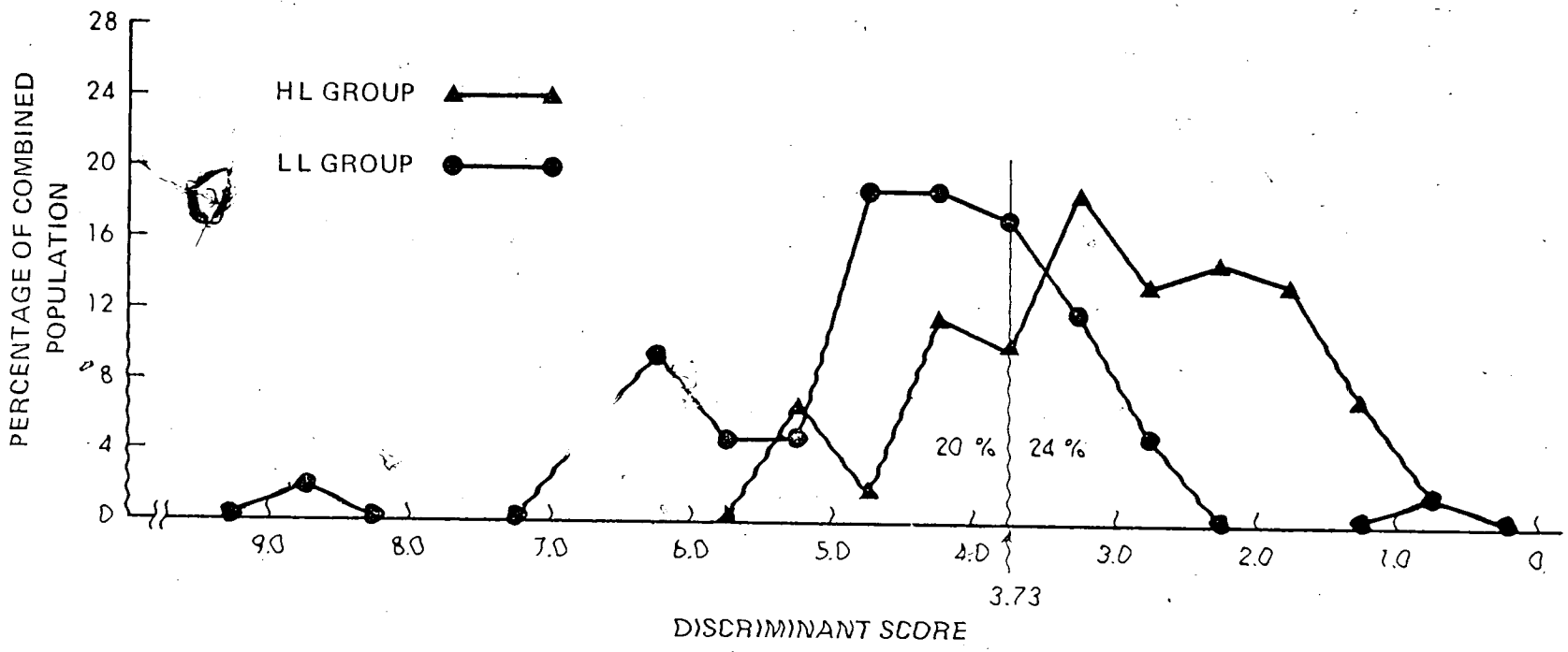


FIGURE 7

FREQUENCY DISTRIBUTION OF DISCRIMINANT SCORES FOR SELECTED SUBSET 2 (SET A PREDICTORS)



predictors separate analyses were carried out using first the two extreme criterion groups (HL and LL), and then the three groups (HL, ML, and LL). Means and standard deviations of the three groups for the Set B predictors are shown in Table 12. A summary of the results of the multiple discriminant analyses is shown in Tables 13, 14, and 15. The HL and LL groups are significantly differentiated at the .10 level or better by each of three variables on the univariate dimension (Table 13). Multivariately, they were separated significantly (Table 14) by the discriminant function containing all the Set B variables using the F modification of the Wilk's lambda criterion ($F_{22,23} = 1.71$, $p = .103$).

Two of the variables which significantly differentiated the two extreme groups also differentiated three groups (Table 13). Discriminant score means (centroids) from the multivariate analysis of the three criterion groups (HL, ML, and LL) are shown in Table 15. Neither of the two discriminant functions (I and II) significantly separated groups ($\chi^2_{23} = 28.36$, $p = .20$; $\chi^2_{21} = 25.41$, $p < .30$, respectively), nor did the two functions considered together ($F_{44,154} = 1.24$, $p = .17$). Figure 8 represents spatially the centroids plotted on the two discriminant score dimensions. The two extreme groups (HL and ML) are well separated on the first discriminant function, but not the ML group from the HL group. It appears that the Set B predictors did not discriminate groups as well as the Set A predictors, as was seen in Figure 2.

A frequency distribution of the HL and LL group discriminant scores are shown in Figure 9. Assumptions of normality and equal

Table 12

Means and Standard Deviations of Set B Predictors

Predictor		Criterion Performance Groups		
No.	Description	High-level	Middle-level	Low-level
	Application Questionnaire			
42	Life insurance	5.71(4.49)	6.07(4.46)	7.08(.13)
43	Savings	7.86(3.83)	7.87(3.82)	7.44)
44	Investments	1.86(2.64)	2.64(3.47)	2.04( )
45	Home ownership	1.43(1.92)	1.33(1.68)	2.04(3.99)
46	Charge accounts	7.43(4.07)	6.24(4.44)	6 0(1.41)
47	Auto finance	7.43(4.07)	5.42(4.50)	6.00(5.25)
48	Smoke	7.43(4.07)	6.24(4.44)	6.72(5.13)
49	Drink moderately	8.29(3.53)	7.22(4.16)	6.00(5.25)
50	Gambling games	4.86(4.45)	6.07(4.46)	5.64(5.28)
51	Read much	7.00(4.24)	6.07(4.46)	5.28(5.27)
52	Years driving	6.38(3.48)	5.49(2.41)	4.68(4.06)
53	Mileage	4.24(2.94)	3.56(2.24)	3.88(3.35)
54	Motorcycle	3.57(4.07)	4.60(4.41)	4.20(5.12)
55	Operate police radio	2.29(3.15)	2.63(3.47)	0.96(2.69)
56	Operate switchboard	1.43(1.92)	2.80(3.60)	2.04(3.98)
57	Exercise authority	4.86(4.45)	6.72(4.33)	5.68(4.50)
58	Experience firearms	8.29(3.53)	6.40(4.41)	4.96(4.47)
59	Type - words-per-minute	2.81(1.14)	2.90(1.54)	2.36(1.94)
60	Study easily	7.87(3.83)	7.06(4.22)	4.56(5.19)
61	Prompted to apply	7.86(3.83)	7.09(3.92)	6.40(4.41)
62	Special interests	6.57(4.37)	4.11(4.28)	4.96(4.47)
63	Special training	5.71(4.50)	4.27(4.33)	4.60(4.41)

Table 13

Summary of Multiple Discriminant Analyses of Set B Predictors

Predictor		Two Groups		Three Groups		
No.	Definition	p	Scaled Weights	p	Scaled Weights DF I	DF II
	Application Questionnaire					
42	Life Insurance	.35	12.908	.57	7.226	-5.554
43	Savings	.75	-5.286	.91	0.033	11.295
44	Investments	.86	-4.890	.62	-5.877	-4.299
45	Home ownership	.53	1.159	.50	7.945	0.234
46	Charge accounts	.43	-5.755	.57	-3.965	6.054
47	Auto finance	.33	6.269	.25	5.125	11.272
48	Smoke	.62	-2.846	.60	2.730	8.779
49	Drink moderately	.10	-5.191	.22	-8.450	-1.080
50	Gambling games	.60	7.317	.61	7.588	-5.889
51	Read much	.25	-2.698	.47	3.699	5.034
52	Years driving	.15	-4.414	.20	-10.712	3.630
53	Mileage	.71	-7.877	.62	-0.117	5.747
54	Motorcycle	.66	3.630	.68	-0.352	-5.233
55	Operate police radio	.14	-3.737	.11	-6.686	-6.803
56	Operate switchboard	.53	6.391	.28	7.907	-13.431
57	Exercise authority	.55	-0.798	.24	-2.822	-16.940
58	Fire arms	.009	-11.016	.04	-17.535	3.098
59	Type - words-per-minute	.36	-1.631	.36	-7.660	-5.189
60	Study easily	.02	-8.597	.03	-11.924	-4.474
61	Prompted to apply	.25	-0.448	.36	-3.261	-5.264
62	Special interest	.23	-5.534	.10	5.330	14.845
63	Special training	.41	2.326	.45	9.069	12.742

Table 14

Discriminant Score Means and Standard Deviations for Two Criterion Performance Groups (Set B Predictors)

Group	Discriminant Function
High-level	-10.18(3.406)
Low-level	-5.446(3.377)

$F = 1.71$, $df_1 = 22$, $df_2 = 23$, $p = .103$

Discriminant Function (100% of variance)

$\chi^2 = 33$, $df = 22$, $p < .10$

Table 15

Discriminant Score Means and Standard Deviations for Three Criterion Performance Groups (Set B Predictors)

Group	Discriminant Function I	II
High-level	6.84(4.04)	5.52(5.34)
Middle-level	6.02(6.24)	1.27(9.76)
Low-level	3.04(4.46)	3.31(8.89)

$F = 1.24$, $df_1 = 44$, $df_2 = 154$, $p = .17$

Discriminant Function I (53% of the variance)

$\chi^2 = 28.36$, $df = 23$, $p = .20$

Discriminant Function II (47% of the variance)

$\chi^2 = 25.41$, $df = 21$, $p < .30$

FIGURE 8
DISCRIMINANT SCORE MEANS (CENTROIDS) OF
CRITERION PERFORMANCE GROUPS FOR SET B PREDICTORS

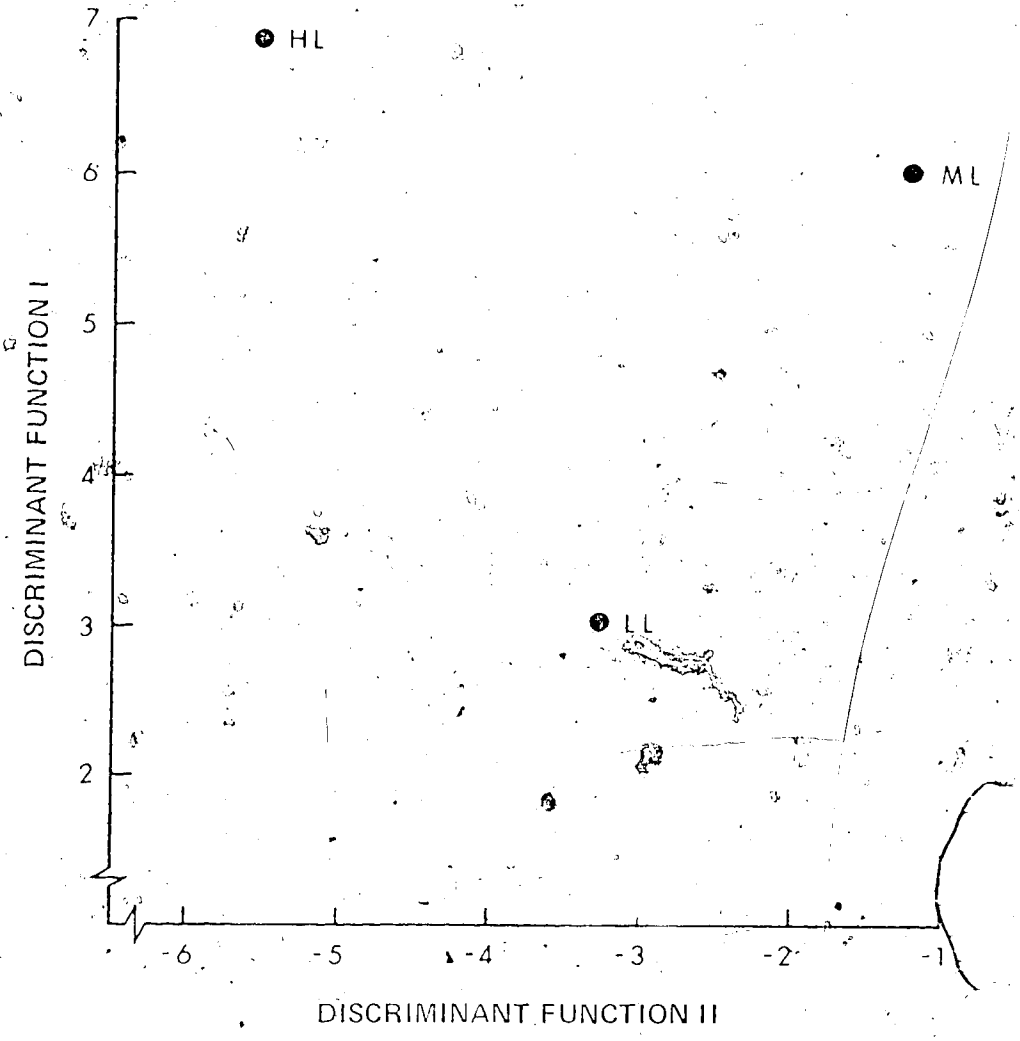
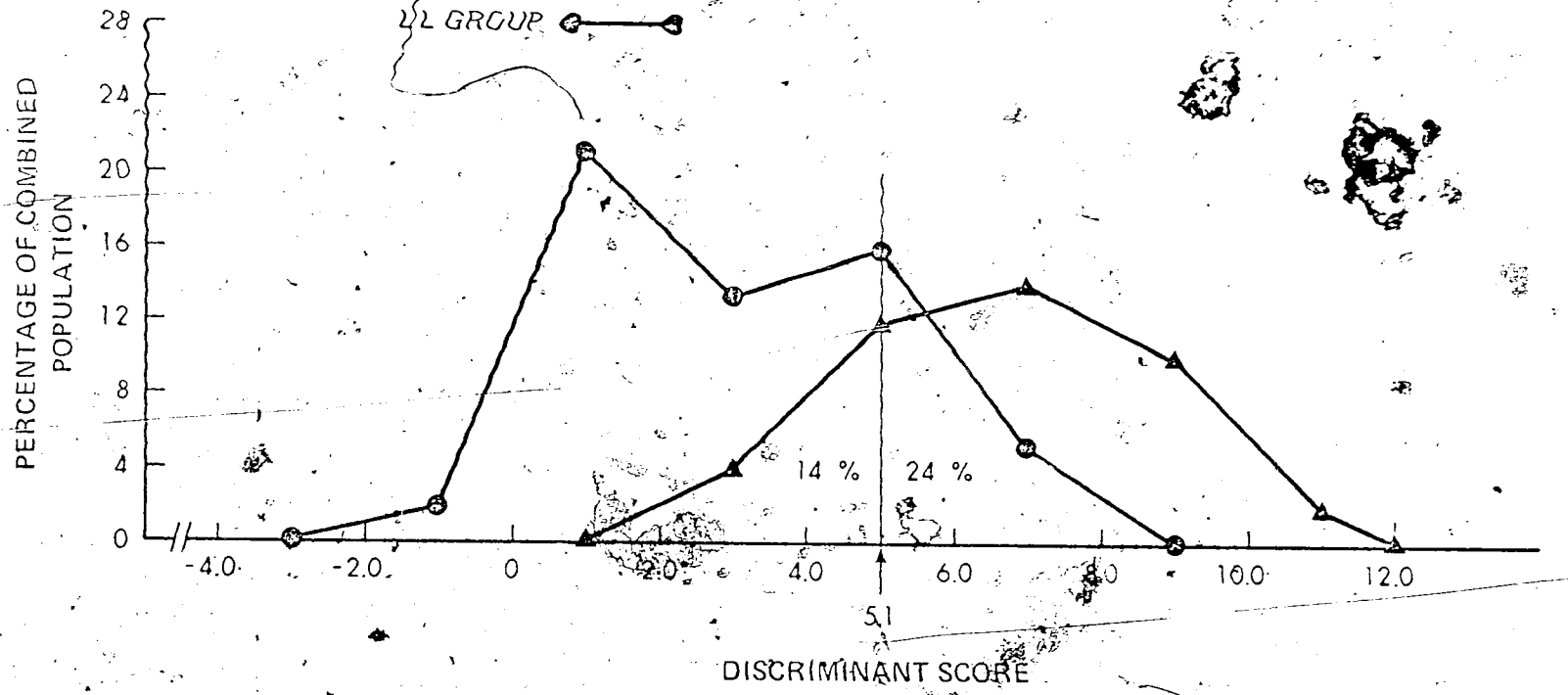


FIGURE 9

FREQUENCY DISTRIBUTION OF DISCRIMINANT SCORES FOR SET B PREDICTORS



variances were reasonably satisfied. Since the two samples of predictors were unequal (n_{HL} = 21, n_{LL} = 25) the base rate occurrence in the population (.46 and .54, respectively) was taken into consideration in determining the cutting point of 5.1. This resulted in misclassification of 14% of the HL Ss and 24% of the LL Ss. The total probability of error was .19.

Table 16 shows the division of Set B predictors into categories of high, moderate, and low contributors to discrimination of groups based on the scaled weights recorded in Table 13.

Step-Wise Multiple Discriminant Analysis. Results of this analysis were handled similarly as for Set A predictors. Table 17 shows the χ^2 distributions for correct classification (i.e., percentage of actual group prediction) of Ss into criterion groups. Except for Steps 2 to 7, the classification is significant at the .05 level, or better. The first variable (60) to be entered discriminated the two extreme groups only: of the actual HL Ss 76% were correctly classified as HL, and the remaining 24% were misclassified as LL; of the actual LL Ss 56% were correctly classified as LL, and the remaining 44% were misclassified as HL; and of the actual ML Ss all were misclassified as HL (65%) or LL (34%). Correct classification better than chance occurred for all three groups by Step 8. Irregular fluctuations in classification then occurred up to the last step with a general overall increase. Percentage overall efficiency (percentage hits) reached 65% by Step 15, and 67% by Step 22.

Table 18 gives a summary of the most representative steps showing changes in predicted percentages of classification, classification

Table 16

Contribution of Set B Predictors to Discrimination of Groups

Categories of Scaled Weights					
No.	High (17.54 - 11.69)	No.	Moderate (11.68 - 5.85)	No.	Low (5.84 - 0.0)
58	Firearm knowledge	43	Savings account	53	Mileage dr
57	Exercise authority	47	Auto finance	61	Reason for ap
62	Special interests	52	Years driving	54	Operate motorcycle
56	Operate switchboard	48	Smoke	51	Read much
63	Special training	49	Drink moderately		
60	Study easily	45	Home ownership		
		59	Type - words-per-minute		
		50	Gambling games		
		42	Life insurance		
		55	Operate police radio		
		46	Number of charge accounts		
		44	Investments		

Table 17

Summary of Step-wise Discriminant Analysis of Set B
Predictors Showing Percentage Correct Classification

Step	Predictor No.	Description	Group HL	Group ML	Group LL	Percentage Overall Efficiency
1	60	Study easily	76***	0***	56***	30
2	58	Knowledge of firearms	57*	23 n.s.	56**	64
3	62	Special interestts	38 n.s.	50**	52**	48
4	57	Exercise authority	52 n.s.	32 n.s.	68***	45
5	56	Operate switchboard	67***	41 n.s.	68***	53
6	52	Years driving	62**	46 n.s.	60**	53
7	45	Home ownership	67***	48*	60**	55
8	47	Auto finance	67***	52**	64***	58
9	63	Special training	67***	56***	64***	60
10	55	Operate police radio	67***	61***	68***	64
11	59	Type—words-per-minute	67***	61***	60**	62
12	46	Number of charge accounts	67***	59***	64***	62
13	43	Savings account	67***	63***	64***	64
14	50	Gambling games	71***	57***	68***	63
15	49	Drink moderately	76***	63***	60**	65
16	42	Life insurance	67***	52**	64***	63
17	44	Investments	71***	59***	64***	62
18	48	Smoke	76***	55***	64***	62
19	51	Read much	76***	57***	64***	63
20	61	Reason for application	-	-	-	-
21	53	Mileage driven	-	-	-	-
22	54	Operate motorcycle	81***	63***	64***	67

χ^2 significance *** $p < .01$ ** $p < .05$ * $p < .10$ n.s. = non significance

Table 18

Summary of Actual and Predicted Classification of Policemen into Criterion Performance Groups (Set B Predictors)

Step	Actual	Percentage of Subjects Classified into Groups: Predicted HL	ML	LL	Percentage of Total Population Classifed into Groups: Predicted HL	ML	LL
1	HL	25	0	13	16	0	5
	ML	57	0	49	36	0	18
	LL	18	0	38	11	0	14
	Total	100	0	100	63	0	37
3	HL	36	18	15	8	6	5
	ML	55	60	45	12	27	15
	LL	9	22	40	2	10	13
	Total	100	100	100	22	45	33
8*	HL	47	13	6	14	5	2
	ML	43	72	42	13	29	12
	LL	10	15	52	3	6	16
	Total	100	100	100	30	40	30
22	HL	53	7	4	17	3	1
	ML	31	83	37	10	34	10
	LL	16	10	59	5	4	16
	Total	100	100	100	32	41	27

* least er[illegible]ssification of HL and LL policemen.

of actual Ss in predicted groups, and percentage classification of the total population. Expected correct percentage classification would be in the ratio of 21:54:25 (n_{HL} = 21, n_{ML} = 54, n_{LL} = 25). The closest approach to this was at Step 3 with the ratio of 22:45:33. Step 8 resulted in the best overall classification of predicted and actual percentages: of the total population 14% were correctly classified as HL, 29% as ML, and 16% as LL, with the least error of classification of HL and LL Ss.

Subset B predictors were selected similarly as for Set A predictors based on the ability of each predictor to reduce the error of classification when added to the discriminating set. Stepwise discriminant analysis of each of the selected subsets revealed that the subset with the combination of the predictors added in the first eight steps (see Table 17) gave the best classification. Seven (7) of these eight predictors had a significant F value (ratio of between groups variance to within group variance) to enter of at least $F = 6.47$, $p < .01$. Five (5) of these were the same variables which were categorized as high contributors, and the remaining three were moderate contributors. The next best subset was a combination of four predictors (no's. 49, 56, 58, and 60). Three of these predictors each by themselves significantly differentiated the three criterion groups on the univariate dimension.

Multiple Discriminant Analysis of Predictor Subsets. The discriminant score means and standard deviations for Subsets 1 and 2 of Set B predictors are shown in Table 19. Statistical significance of discrimination are also given.

Table 19

Discriminant Score Means and Standard Deviations for Selected Subsets of Set B Predictors

	Discriminant Function					
	I			II		
	Criterion Groups			Criterion Groups		
Predictors	HL	ML	LL	HL	ML	LL
Subset 1	8.73(6.83)	6.00(7.70)	4.48(11.66)	-1.62(8.33)	-3.90(10.30)	-1.06(10.21)
Subset 2	12.11(10.40)	9.52(18.51)	7.10(13.87)	1.98(3.88)	3.33(14.10)	2.05(18.51)

Subset 1

$F = 2.36$, $df_1 = 16$, $df_2 = 182$, $p = .003$

Discriminant Function I (59% of the variance)

$\chi^2 = 20.96$, $df = 9$, $p < .02$

Discriminant Function II (41% of the variance)

$\chi^2 = 15.17$, $df = 7$, $p < .05$

Subset 2

$F = 2.48$, $df_1 = 8$, $df_2 = 190$, $p = .014$

Discriminant Function I (85% of the variance)

$\chi^2 = 16.24$, $df = 5$, $p < .01$

Discriminant Function II (15% of the variance)

$\chi^2 = 3.15$, $df = 3$, $p < .50$

For Subset 1 (8 variables) the two discriminant functions together significantly separate the three criterion groups ($F_{16,182}$ = 2.36, p = .003). Discriminant function I accounted for 59% of the variance better than chance (χ^2_9 = 20.96, p < .02). Discriminant function II significantly accounted for the remaining 41% of the variance (χ^2_7 = 15.17, p < .05). Figure 10 spatially represents these findings.

For Subset 2 (4 variables) the two discriminant functions together significantly differentiated the three criterion groups ($F_{8,190}$ = 2.48, p = .014). Discriminant function I accounted for 85% of the variance. It significantly discriminated the three groups (χ^2_5 = 16.24, p < .01). Discriminant function II accounting for the remaining 15% of the variance was not significant (χ^2_3 = 3.15, p < .50). These results are shown spatially in Figure 11. As was found with the Set A predictors both of the selected Subsets 1 and 2 discriminated the three criterion groups better than the original set of predictors (χ^2_{23} = 28.36, p = .20, χ^2_{21} = 25.41, p < .30, respectively).

Figures 12 and 13 represent graphically the frequency distributions of the selected Subsets 1 and 2 for the HL and LL groups. Cutting points were established according to the base rates for the HL and LL groups (.46 : .54, respectively) to account for differing sample sizes. Assumptions of normality and equal variances are reasonable for Set 1, but not for Set 2. Changes in error classification for these frequency distributions as compared with the original Set B predictors (Figure 9) are as follows: For Subset 1 misclassification

FIGURE 10

DISCRIMINANT SCORE MEANS (CENTROIDS) FOR SELECTED SUBSET 1 (SET B PREDICTORS)

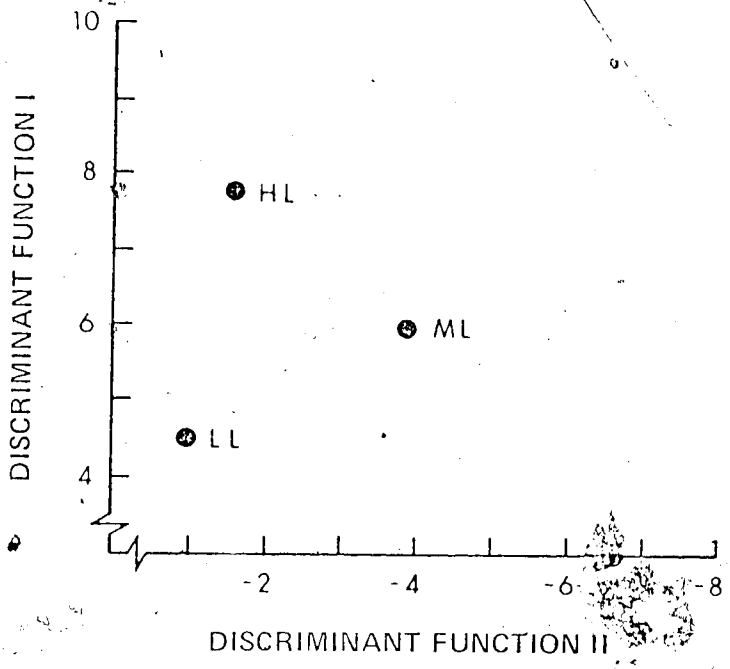


FIGURE 11

DISCRIMINANT SCORE MEANS (CENTROIDS) FOR SELECTED SUBSET 2 (SET B PREDICTORS)

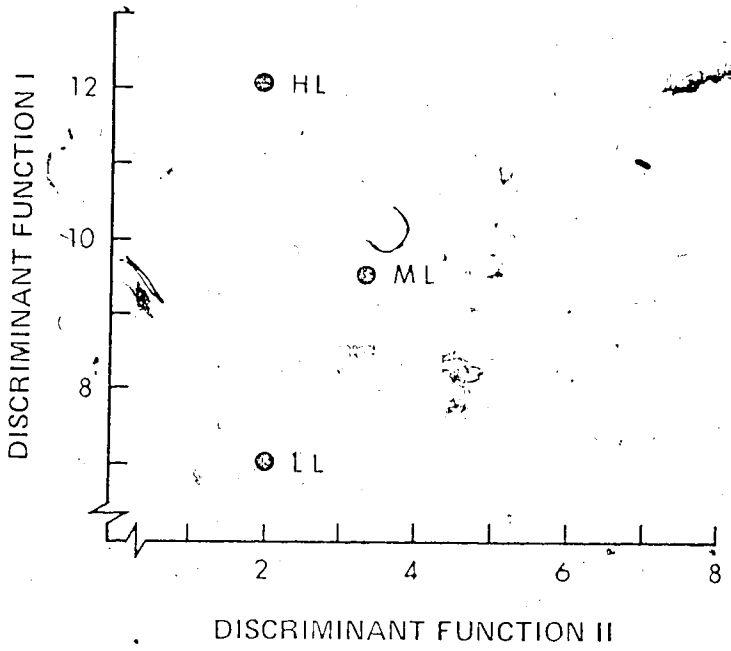


FIGURE 12
FREQUENCY DISTRIBUTION OF DISCRIMINANT SCORES FOR SELECTED SUBSET I (SET B PREDICTORS)

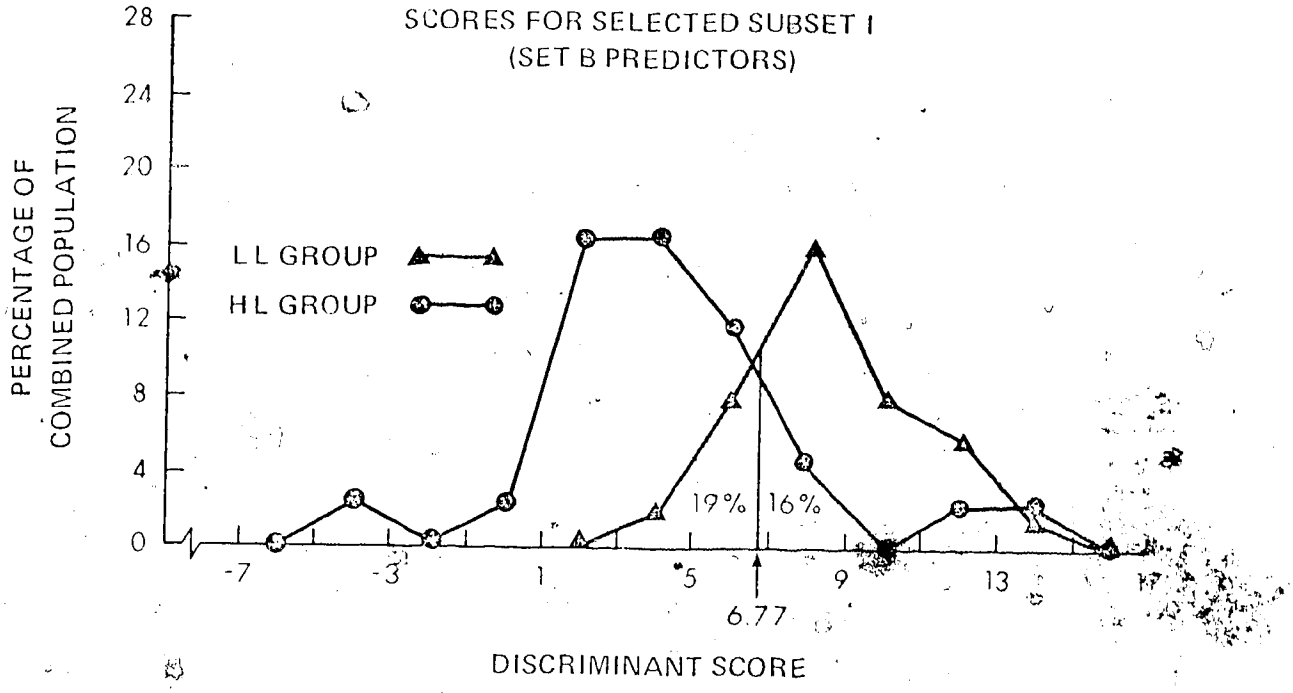
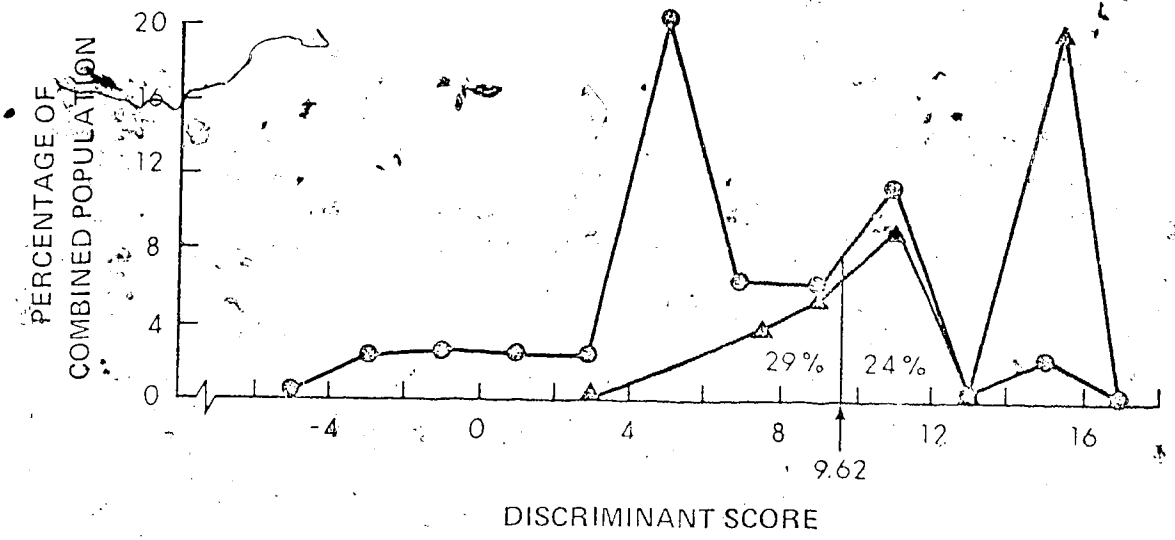


FIGURE 13
FREQUENCY DISTRIBUTION OF DISCRIMINANT SCORES FOR SELECTED SUBSET 2 (SET B PREDICTORS)



of HL Ss increased from 14% to 19%; misclassification of LL Ss decreased from 24% to 16%; and the error classification of total population decreased from 19% to 17.5%. For Subset 2 the error classification of total population increased to 26% (29% misclassification of HL Ss, and 24% misclassification of LL Ss). These findings indicated that Subset 1 was better than Subset 2 and the original set for prediction of criterion groups.

CHAPTER IV

SUMMARY OF RESULTS AND DISCUSSION

Summary of Results

Analysis of the data was carried out in several steps in order to select the best combination of predictor variables (personal data) which maximized discrimination among the criterion performance groups (high-level, HL; middle-level, ML; low-level, LL). The predictors to enter into these subsets were chosen on the basis of their ability to reduce the errors of classification of Ss into criterion performance groups. The two separate sets of variables (Set A and Set B predictors) were each analyzed using two different methods (multiple discriminant analysis, and step-wise discriminant analysis. A summary of results of the procedure steps for both the original sets and selected subsets is given as follows:

Table 20: Discriminant score means and standard deviations for original sets and selected subsets of predictors.

Table 21 Summary of multiple discriminant analysis of original sets and selected subsets of predictors.

Table 22: Percentage misclassification of high-level and low-level policemen.

Table 23: Percentages of total population classified into criterion performance groups.

Table 24: Weighting coefficients of selected Set A predictors.

Table 25: Weighting coefficients of selected Set B predictors.

Table 20 gives the discriminant score means and standard deviations for all sets and selected subsets of predictors. The results of the multiple discriminant analyses found in Table 21 show the changes in probabilities associated with the tests of significance. For the Set A predictors the probabilities of chance discrimination of criterion performance groups by the two discriminant functions together decreased from p = .12 to p = .00003 as further selection occurred. Subset 2 with 11 variables separated groups best. For the Set B predictors, Subset 1 resulted in the best differentiation of groups (p = .003). This shows that maximization of discrimination was facilitated by the predictor selection procedure.

Discriminant function I in all cases accounted for a greater amount of variance and separated groups better than discriminant function II. A frequency distribution of the discriminant scores for the Ss in the extreme groups (HL and LL), as given by discriminant function I, was made for all sets and subsets of predictors (see Figures 3, 6, 7, 9, 12, and 13). The ML group was not included in these figures as they were not as well discriminated as the HL and LL groups. Misclassification of HL and LL policemen is the main concern in predicting police performance. By establishing cutting points midway between the two group means the percentages of misclassification were calculated. They are summarized in Table 22. The assumptions of normality of distribution and equal variances were reasonably applicable to all distribution except Subset 2 of Set B predictors. The change in misclassification of total population was small as the number of variables were reduced from the

Table 20

Discriminant Score Means and Standard Deviations for Original Sets and Subsets of Predictors

Predictors		Number of Variables	Criterion Groups HL	ML	LL
Discriminant Function I					
Set A	Original Set	41	-2.27(1.03)	-1.19(1.26)	-0.41(1.56)
	Subset 1	27	0.52(0.16)	0.17(0.20)	-.20(0.23)
	Subset 2	11	2.97(1.27)	3.82(1.50)	4.49(1.67)
Set B	Original Set	22	-6.84(4.04)	-6.02(6.24)	-3.04(4.46)
	Subset 1	8	8.73(6.83)	6.00(7.70)	4.48(11.66)
	Subset 2	4	12.11(10.40)	9.52(18.51)	7.10(13.87)
Discriminant Function II					
Set A	Original Set	41	-3.13(0.97)	-3.74(0.72)	-3.46(1.18)
	Subset 1	27	-0.69(0.15)	-0.93(0.12)	-0.70(0.16)
	Subset 2	11	-0.46(2.95)	-1.22(2.26)	-0.34(2.47)
Set B	Original Set	22	5.52	1.27(9.76)	3.31(8.89)
	Subset 1	8	-1.62	-3.90(10.30)	-1.06(10.21)
	Subset 2	4	1.98(3.88)	3.33(14.10)	2.05(18.51)

Table 21

Summary of Multiple Discriminant Analysis of Original Sets and Subsets of Predictors

Predictors		Discriminant Function											
		I and II			I				II				
		F	df	p	% Variance	χ^2	df	p	% Variance	χ^2	df	p
Set A	Original Set	1.21	82,480	.12	69	66.26	42	.008	31	31.84	40	.15
	Subset 1	1.75	54,506	.001	73	65.27	28	<.01	27	26.02	26	<.50
	Subset 2	2.79	22,538	.00003	71	41.40	12	<.01	29	18.03	10	<.10
Set B	Original Set	1.24	44,754	.17	53	28.36	23	.20	47	25.41	21	.30
	Subset 1	2.37	16,182	.003	59	20.96	9	<.02	41	15.17	7	<.05
	Subset 2	2.48	8,190	.014	85	16.24	5	<.01	15	3.15	3	<.50

Table 22

Percentage Misclassification of High-level and Low-level Policemen Using Discriminant Scores

Predictors		Group	Misclassification	
			Sample	Total Population
Set A	Original Set	HL	15	15
		LL	15	
n = 118	Subset 1	HL	17	16
		LL	15	
	Subset 2	HL	20	22
		LL	24	
Set B	Original Set	HL	14	19
		LL	24	
n = 46	Subset 1	HL	19	17
		LL	16	
	Subset 2	HL	29	26
		LL	24	

original set to the first subset in each of Set A and Set B predictors (15% to 16%, and 19% to 17%, respectively). A more noticeable increase in error classification occurred with a further reduction of variables to the second subset (22% for Set A and 26% for Set B).

Table 23 records the percentages of the total population classified into the three criterion performance groups. Expected actual classification percentages of the total population in each group would be in the ratio of 21:58:21 for Set A predictors. Both selected subsets 1 and 2 were closer (30:40:30) to this ratio than the original set of predictors. The percentage of total population correctly classified was more optimum for Subset 1 with an overall efficiency of 62%. This increased to 79% when the HL and ML groups were considered together as one group. Least errors of classification resulted also using Subset 1. For Set B predictors, Subset 1 gave the closest ratio of 30:39:31 to the expected actual percent classification (21:54:25). In this case the original set predicted with the best overall efficiency (67% and 80%), but also gave the highest misclassification of LL Ss as HL. Subset 1 resulted in the least errors of classification of HL and LL policemen.

Tables 24 and 25 give the weighting coefficients of the variables included in the selected subsets of predictors. These weights can be applied to the scores of new applicants for the purpose of predicting criterion performance.

Police Selection

It has been shown that certain personal data as present in the

Table 23

Percentage of Total Population Classified into Criterion Performance Groups for Original Sets and Subsets of Predictors

	Predictors	Actual Classification	Predicted Classification HL	ML	LL	Total	Percentage Overall Efficiency HL,ML,LL	(HL+ML),LL
Set A	Original Set	HL	15	4	2	21	55	73
		ML	14	28	16	58		
		LL	3	6	12	21		
		Total	32	38	30	100		
	Subset 1	HL	15	4	2	21	62	79
		ML	13	32	13	58		
		LL	2	4	15	21		
		Total	30	40	30	100		
	Subset 2	HL	13	5	3	21	55	74
		ML	14	30	14	58		
		LL	3	5	13	21		
		Total	30	40	30	100		
Set B	Original Set	HL	17	3	1	21	67	80
		ML	10	34	10	54		
		LL	5	4	16	25		
		Total	32	41	27	100		
	Subset 1	HL	14	5	2	21	58	76
		ML	13	28	13	54		
		LL	3	6	16	25		
		Total	30	39	31	100		
	Subset* 2	HL	10	4	7	21	44	66
		ML	18	20	16	54		
		LL	3	8	14	25		
		Total	31	32	37	100		

* Assumption of normal distribution and equal variances not satisfied.

Table 24

Weighting Coefficients of Set A Predictors for Prediction of Criterion Performance

Predictors		Weights	
No.	Description	Subset 1	Subset 2
30	Interviewer's appraisal	-0.20	+0.65
41	Character investigation	-0.21	+0.61
36	Rank among siblings	+0.02	-0.12
21	General knowledge mark	+0.04	-0.135
17	Composition - suitable reasons	+0.07	-0.26
1	Number of arrests	+0.03	-0.08
4	Total indebtedness	-0.04	+0.17
20	Language mark	-0.06	+0.20
27	Social adjustment	-0.04	+0.13
37	Number of children	+0.025	-0.08
7	Boxing knowledge	-0.04	+0.10
13	Police force experience	+0.03	-
31	Number of addresses	-0.025	-
25	Family background	+0.006	-
32	Dismissals	-0.03	-
29	Health adjustment	-0.59	-
14	Labor organization	-0.02	-
16	Composition - contribution to self	-0.01	-
18	Composition - number of errors	+0.01	-
9	Foreign language	+0.03	-
33	Number of convictions	+0.03	-
34	Canadian citizenship	+0.03	-
11	Other applications	-0.04	-
28	Economic adjustment	+0.74	-
15	Composition - contribution to society	-0.01	-
24	Years education	+0.07	-
12	Military service	+0.03	-

Table 25

Weighting Coefficients of Set B Predictors for Prediction of Criterion Performance

Predictors		Weights	
No.	Description	Subset 1	Subset 2
60	Study easily	+0.31	+0.54
58	Knowledge of firearms	+0.39	+0.64
62	Special interests	+0.13	-
57	Exercise authority	-0.15	-
56	Operate switchboard	-0.41	-0.40
52	Years driving	+0.59	-
45	Home ownership	-0.45	-
47	Auto finance	+0.06	-
49	Drink moderately	-	+0.38

pre-employment documents were more effective than others in discriminating among the three levels of criterion performance (HL, ML, and LL). This research was carried out on policemen who had been employed following a rigorous screening process. They were chosen on the belief that they would make good policemen. Of these men 21% were later found to be rated as low-level (LL) according to the performance criterion. Analysis of the data has resulted in selection of items which can, when combined together, reduce the number of low-level policemen hired to as low as 7%.

The findings of this study could be used to increase the accuracy of predicting job performance in new applicants. Scores for the items in the selected subsets could be obtained from future applicants, multiplied by their corresponding weights (see Tables 24 and 25), and summed to give a total discriminant score. Those with the best scores could be accepted.

The question of which combination of predictors to use would depend upon the requirements set by selection goals. Using the fewest items possible would be more practical, but must be weighed against the probability of error classifcation. Since the Set A predictors were analyzed with a larger sample (n = 283) than Set B predictors (n = 100), a predictive equation composed of variables selected from this set would give more valid results.

The choice of which cut-off point to use for the best discriminant scores would depend upon several factors: the number of recruits required, the number of suitable applicants available, and the risk of hiring unsuitable policemen one is willing to take. If

the population of suitable applicants were large enough, a recruit class of mostly HL policemen could be selected. The smaller the population from which to choose the recruits the larger the porportion of ML policemen that will have to be accepted. It has been demonstrated that ML policemen were not as well differentiated as the HL and LL policemen. A hypothetical example will serve to illustrate how the results of this study could be applied to selection. For this purpose the figures for Subset 1 (Set A predictors) recorded in Table 23 will be used.

If 100 suitable applicants were available, and a class of 30 recruits was required, the policemen with the best 30 discriminant scores would be accepted. In this case only those predicted to be HL would need to be accepted with the actual classification being as follows:

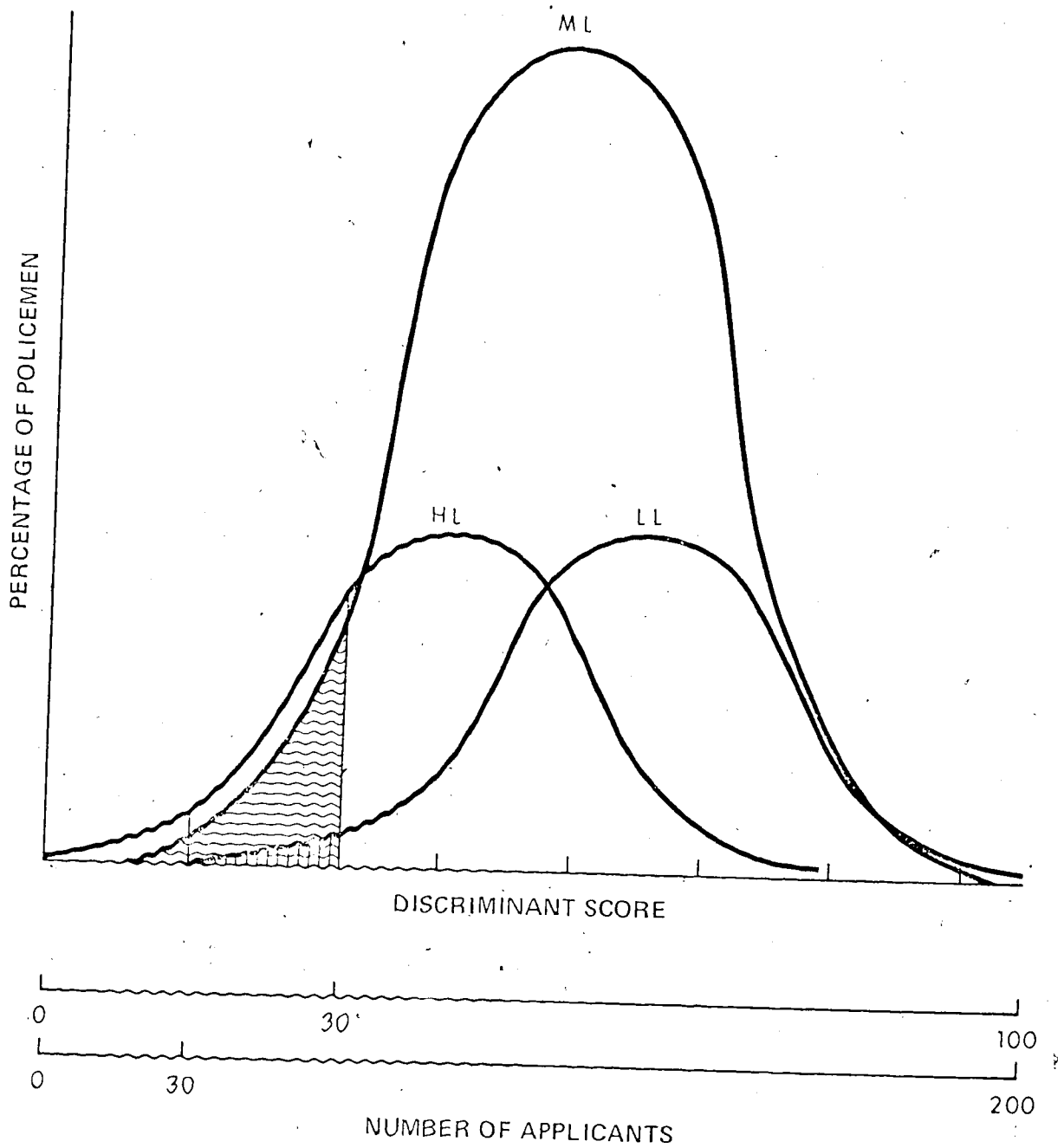
	Rejected as ML and LL		Accepted as HL	
Actual Membership	Number	%	Number	%
HL	6	8	15	50
ML	46	66	13	43
LL	18	26	2	7
Total	70	100	30	100

Of the class of 30 recruits the actual membership in terms of criterion performance would be 15 HL, 13 ML, and 2 LL.

If the number of suitable applicants was larger (e.g., 200) then the selection of a class of 30 recruits with the highest discriminant scores would result in an increase in the percentage of HL policemen, and a corresponding decrease in the percentage of ML and LL policemen. This is demonstrated in Figure 14. By moving

FIGURE 14

REPRESENTATIVE FREQUENCY DISTRIBUTION OF DISCRIMINANT SCORES



the cut-off point to the left, the areas under the curves decrease for the ML and LL groups, leaving a proportionately larger area for the HL group.

Personality Characteristics of High-level and Low-level Policemen

From the findings of this study personality characteristics of the high-level (HL) and low-level (LL) policemen based on personal data (Set A and Set B predictors) will be discussed. The variables used in describing these policemen are listed in Table 26. They include those items which significantly differentiated the two groups on the univariate dimension (i.e., each by themselves separated groups) as was shown in Tables 5 and 13. These variables are denoted by/* = $p < .10$, ** = $p < .05$, and *** = $p < .01$. The remaining variables discriminated significantly between groups on a multivariate dimension only (i.e., high or moderate contribution to prediction when considered in relation to each other). Most of these latter items had a $p = .30$, or less, of univariately separating the two groups. A high-level policeman would tend to exhibit most of the defining characteristics in the first column of Table 26, and a low-level policeman most of those in the second.

Personality characteristics suggested by the univariately significant variables will be discussed first. The three most significant items were the interviewing officer's appraisal (30), character investigation (41), and fire-arm knowledge (58) as shown in Table 26. High-level policemen were rated above average by the interviewing officer (Appraisal) on physical and mental ability, stability, moti-

Table 26

Pre-employment Personal Data of High-level and Low-level Policemen

Category Description	Policemen	
	High-level	Low-level
Occupational History	Police force experience No dismissals Not member of labor organization No other applications Military experience *Fewer previous occupations	No police force experience One or more dismissals Member of labor organization Other applications No military experience More previous occupations
Intellectual Development	Higher General Knowledge mark Slightly lower Language mark Fewer errors in Composition **Study easily	Lower General Knowledge mark Slightly higher Language mark More errors in Composition Do not study easily
Financial Status	**Less total indebtedness **Average economic adjustment Do not own home Auto finance	More total indebtedness Fair economic adjustment Do own home No auto finance
Social Development	Average social adjustment Have children Very Good family background Canadian citizen *Drink moderately	Slightly below Average social adjustment Have no children Fair family background Not a Canadian citizen Do not drink
Character Development	***Above Average stability and maturity (Appraisal) ***Above Average character (Investigation)	Below Average stability and maturity (Appraisal) Average character (Investigation)

Table 26 (continued):

Category Description	Policemen	
	High-level	Low-level
Traffic History	More years driving Two or more arrests Had at least one conviction	Fewer years driving One or no arrests No convictions
Special Qualifications	*Emphasis on suitable reasons for wanting to become a policeman - *No knowledge of boxing ***Experience with firearms Very Good special interest in police work	- Emphasis on contribution to society as reason for wanting to become a policeman Have knowledge of boxing No experience with firearms Fair special interest in police work

Univariately Significant

*** p = .01, or less

** p = .05, or less

* p = .10, or less

vation, and maturity. Low-level policemen were rated slightly below average. This variable was a subjective impression of the applicant's potentiality as a policeman made during the interview which centered upon the items found in the Personal History Sheet (Appendix E). It is interesting to note that the appraisal variable correlated very little (< .2) with any of the other items. This suggests that the interviewer was judging the applicant on attributes other than those listed. For example, he may have been influenced by the applicant's physical appearance, manner and bearing, facial expression, spontaneity, etc., all which had been associated by the interviewer through experience with type of performance expected. High-level (HL) policemen were also rated above average on Character Investigation (41) as opposed to an average rating for LL policemen. In summary, it appears that the HL policeman possessed a sum of characteristics, detected by the selection officers as standing out from the average policeman. This could be defined as an overall impression.

Other significant characteristics of the HL policeman compared with the LL policeman were ability to study easily, less total indebtedness, fewer previous occupations, and no knowledge of boxing. He scored better on Social and Economic Adjustment. Emphasis was placed on suitable reasons for becoming a policeman in contrast to the LL policeman who emphasized contribution to society. He also consumed alcohol in moderation, while the LL policeman did not drink at all. These findings suggest the HL policeman had a more stable occupational history and financial status, had more efficient mental

processes, more social outlets, was more flexible, and in general more maturely developed than the LL policeman. Their maturity was reflected in observable behavior assessed by others as more outstandingly good than LL policemen. The rest of the characteristics listed would tend to support these hypotheses. They will be discussed under the separate categories of personal data.

Occupational History. Policemen who had had previous experience in a police force or the military service were more likely to fall in the HL performance group than in the LL performance group. Both the police and the military have comparable requirements in terms of regimentation, and protection and defense skills. It is necessary for them both to accept command authority on one hand, and on the other to be able to assume the initiative when required. Rational behavior must be demonstrated even in times of stress. The better performance by the HL policemen may be partly explained by the prior experience and the knowledge which they brought to their present job. It may also be that they had specific personalities and characteristics which attracted them to the general field in the first place, and allowed them to be successful. Selection of these men who were proven to be effective in this area would serve as a situational test of future police performance. It would be expected that they would continue to be effective in their present job.

Also found in the HL group were those policemen who had had no previous dismissals, no other applications at the time of selection, and had not been a member of a labor organization. These findings

suggest that policemen who had a capacity for good interpersonal relationships and for acceptance of authority were later rated as HL in performance. They appeared to be more able to satisfy their own needs, and to meet those of their employer. These findings could be attributed to behavior that was more goal directed, reflecting a developed interest. The policemen who tended to have more conflict, doubt, and ambivalence, both internally and externally, were rated as LL. A possible interpretation of the results was that these men were more likely to go from job to job, seeking satisfaction of unmet needs, and being unable to meet the demands of their employers. They could be seen as seeking employment in the police field for the wrong reasons. That policemen who had been members of a labor organization were more likely to be LL in performance was consistent with an unstable work history. The more jobs they had, the greater the probability that they could be employed in jobs that involved labor organizations.

Intellectual Development. The number of years education was not an important discriminator between HL and LL policemen so was not seen as an influence on intellectual development. Important differences were found in the type of development of mental functioning. The higher General Knowledge mark achieved by the HL policeman suggested they had broader interests, interacted freely with their surroundings, integrated information meaningfully, and had no obvious repressive trends. This hypothesis was given further support by their capacity to study easily, indicating freedom from incapacitating distractibility. As compared with LL policemen they were able

to concentrate and attend better, not disrupted by anxiety or requiring external stimulation.

Of interest was the higher Language mark achieved by LL policemen, in relation to the greater number of errors in Composition. Errors in Composition included scores on lack of integration and clarity not accounted for in the Language mark. Thus, LL policemen were not as good as HL policemen at integrating their thoughts into concepts. They attended to and learned rules better, possibly suggesting they depended more on structural guides for behavior. In contrast the HL policemen had less need for external structuring, and less disruption of integrative processes.

These findings suggested that policemen who were more flexible and tolerant of ambiguities, who did not deny and repress reality, and who were able to live with their conflicts and uncertainties, tended to fall in the HL performance group.

Financial Status. The better rating on Economic Adjustment by the interviewing officer indicated that the HL group included policemen who were more concerned with future financial security than the LL group. They had more savings, investments, and insurance. Also their total indebtedness (charge accounts, loans, auto finance, etc.) was half as much as that of the LL policeman. Total indebtedness did not include home ownership mortgages. Fewer HL policemen owned their homes than LL policemen. They also tended to finance buying a car. Assuming he owned a car, the LL policeman most likely paid by cash rather than finance it. These facts suggest that LL policemen were spending their money more on material possessions such as a house, clothes, furniture, etc., than HL policemen.

Social Development. The rating of Average on Social Adjustment by policemen who had a good balance of outlets through activities and interpersonal relationships became HL performers. They were described as being involved in most of the following: clubs, sports, hobbies, recreation, and dating a steady girlfriend (or had a wife). Policemen who were more restricted, made use of fewer of these outlets.

The HL policeman also had had a happy homelife and had good family (parental) relationships. They were more likely to have children of their own. High-level (HL) and LL policemen did not differ significantly in age and marital status. Thus, although both HL and LL policemen had equal propensity for marriage, the HL policemen were more apt to accept early responsibility of a family. This suggested a relationship between family background and present family stability, the early experience of security and fulfillment of needs leading to a higher level of responsibility. The early acceptance of family responsibility by HL policemen may be related to preference for planning for future security, rather than accumulating material possessions.

Of interest was the finding that HL policemen drank alcoholic beverages in moderation in contrast to LL policemen who did not drink at all. It is possible that of those policemen who claimed abstinence, some were denying that they drank, either because they believed abstinence to be a positive feature in police work, or because they were concealing a drinking problem. In either case they were displaying a need for acceptance and approval. Some of the true

abstainers may have refrained from drinking for moral or religious reasons. If this were the case, then it could be hypothesized that they would also have a strict general system of rules by which to live. It might be generalized further that they were also idealistic, and possibly unrealistic with expectations of self and others, that could in turn result in dissatisfaction in police work. Admission to drinking moderately suggests a less defensive, and more tolerant attitude to behavior of self and others. The realities and ambiguities found in police work would be less frustrating to men with flexible views. Drinking moderately may also be seen as sociably acceptable outlet for minor frustrations.

High-level policemen were also more likely to be Canadian citizens. This variable was included in the category of Social Development because non-citizenship implied disrupted social and family ties, as well as lower knowledge of cultural and social values of the adopted country. This does not suggest that immigrants were less well developed, but that their suitability to police work may have been hampered by their situation.

Character Development. This category was discussed above. The Appraisal and Character Investigation reflect above average qualities in HL policemen that were observable by others, and which created a better overall impression than those of the LL policemen who tended to be seen as average.

Traffic History. High-level (HL) policemen were likely to have had more years of driving experience than LL policemen. This finding was not a function of age since HL and LL policemen were not

differentiated on this factor. The HL policemen apparently had more opportunity to begin driving a car at an earlier age. The fact that they had more arrests (traffic violations) and at least one conviction compared with LL policemen may be partly accounted for by the longer driving period. It may also represent a personality difference. The minor infractions of the law made by HL policemen in their early years suggests they were less mindfull of limits imposed on them by society than LL policemen. This may relate to an earlier hypothesis that LL policemen sought structure in their environment, and needed rules for guidance. Having tested the limits the HL policeman might be more suitable because he can now accept them. He might also be more tolerant and understanding of others who break the law.

Special Qualifications. Included in this category were those variables which differentiated HL and the HL policemen on qualities considered to have special qualification and reference to police work. In the composition on reasons for wishing to become a policeman, HL policemen placed emphasis on altruistic reasons, while LL policemen were more concerned with contributing to society. The high scorers on the Suitable Reasons predictor showed motivations and realistic approach to the job situation. He integrated mental and physical abilities with job requirements and indicated a desire to build a career in police work. The low scorers mentioned isolated components of knowledge and abilities (judo, boxing, physical strength, knowledge of self-defense, etc), but related them less effectively to the role of a policeman. They did not state a career as their goal.

The "liking of people" was listed as one of their qualifications. Associated to these latter findings was the LL policeman's concern with making a contribution to society. They gave "helping others" and "protection of society" as their reasons for wanting to become a policeman. High-level policemen tended to not mention any contribution to society, or placed little emphasis on it. This indicated that the LL policemen who saw themselves as more altruistic, and who were less interested in police work as a career were less suited than those who were seeking a career and could give realistic and logical integrated reasons for doing so. Levy (1967) discussed this point suggesting the individual who wants to "help" society may later be disillusioned by his role as a policeman. This would tend to support the earlier hypothesis that LL policemen who abstained from drinking alcoholic beverages did so because of idealistic values.

Related to the emphasis on knowledge of self-defense by LL policemen was the interesting finding that they had knowledge of boxing. Boxing is body contact sport which permits socially sanctioned direct expression of aggression. High-level policemen apparently did not seek this particular outlet, and found other ways of dealing with aggressive needs.

A feature also found in the HL policeman was his Very Good special interests in police work. He tended to describe interests which indicated a realistic and mature understanding of the role and job requirements of a policeman. Such an interest might be the satisfaction and pride derived through a previous experience related to police work (e.g., cadets). The LL policeman was more likely to

give a specialized interest such as knowledge of fire-arms, boxing, etc. without indicating a broader concept of the police field requirements. This finding is in keeping with the results found in the item "suitable reasons for wanting to be a policeman." The integrated realistic approach in both instances was scored higher than an isolated response which did not show the interrelationship of ability to total job requirements.

In summary, the personality traits described above suggest that those applicants who became HL performers were mature, flexible, realistic, and integrated. They could tolerate conflict and ambiguity. On the other hand, those applicants who were rated as LL displayed such features as repressive trends, disrupting anxiety, rigidity, and idealist values. They tended to seek environmental structure and consistency. It is of interest to compare these characteristics with those proposed by others as suitable or unsuitable for police work.

Levy (1967) suggested that those police officers who remained in law enforcement were less reactive to environmental stress (e.g., minority member, ambiguous role expectations, assumption of authority positions) than those who left the force. She theorized that the policemen who terminated employment could be divided into two different groups depending upon how they handled their emotional instability. Either they controlled their emotional reactions by suppressing overt behavior, with resulting anxiety and dissatisfaction; or they could not control their emotions, directing them into unacceptable overt behavior. The former group tended to resign voluntarily (Non-failure separations). The latter group would more likely be

requested by the police department to leave the force (Failure separations). The LL policemen in the present sample appear to be more similar to Levy's Non-failure group than to her Failure group. Other than revealing some past discontent and stress in their lives there was no evidence in their personal history information to indicate behavior that could be classified as socially unacceptable. This suggests that those applicants who were likely to act out overtly under pressure had already been largely screened out by the selection procedure as unacceptable applicants. The assumption could be made that these individuals were identified by their observable past behavior.

Comparable to Levy's (1967) portrayal of suitable and unsuitable policemen is the picture drawn by Rhead (1967) who states:

> "....success or failure in law enforcement career is not determined by unconscious conflict or the nature of the defences alone, but is strongly influenced by the degree to which the ego has remained undistorted in response to those conflicts." (p. 133)

He sees the ideal police officer as able to adapt and regulate his aggressive energies in terms of appro e goals. Unacceptable are those applicants "who manifest primitive uncontrolled aggression leading to disorganized behavior in socially maladaptive patterns" (Levy's Failure group). Equally unsuitable are the applicants who grossly inhibit aggression, resulting in such manifestations as passivity, avoidance, or flight. This latter group was lacking mobility and capacity for appropriate behavior (Levy's Non-failure group). Rhead goes so far as to suggest that "certain traits

ordinarily considered to be 'pathological' are essential ingredients of the personality structure of the 'normal' police officer." By this he is referring to such features as mild suspiciousness, emphasis on virility, and a tendency to act out, which he found present to a greater degree in the police population than in the non-police population. There was no evidence in examining the characteristics of the policemen in this study to support his conclusions. Since he did not differentiate the quality of performance among his police population it may be that the so called "pathological" traits existed in a certain proportion (e.g., low-level policemen) of this group which contributed to differentiation between police and non-police groups.

Policemen have frequently been depicted as authoritarian personalities (Niederhoffer, 1967). Levy (1971) distinguished between the ability of policemen to act in an authoritative, as opposed to an authoritarian, manner. A discussion on the authoritarian personality is given by Brown (1965, p. 505). They are described as prejudiced, rigid, and intolerant of ambiguity; and as tending to idealize themselves and their parents, denouncing out-groups. Neither can they tolerate ambivalent feelings, denying and repressing the unacceptable ones. There is some consistency between these personality characteristics and those attributed to the LL policemen in this research. Policemen defined as HL appear to fit the non-authoritarian personality, which in contrast were represented as flexible, and tolerant of both ambiguity and ambivalence.

Two camps of thought have been expounded to explain the

behavior associated with what has been described as an authoritarian personality among law enforcers (Niederhoffer, 1967). One explanation is that applicants bring to the job earlier acquired values and attitudes consistent with the authoritarian outlook; the other is that it is more a consequence of assuming the police role. That fulfilling the unique requirements of police work can bring about changes in attitude and behavior, particularly over time, cannot be overlooked. The present findings support the contention that certain police recruits do bring to their job more suitable pre-defined qualities, abilities and attitudes than do others.

The Edmonton City Police Department have been quite successful in screening out those unsuitable police applicants who react overtly to stress in unacceptable ways. More difficult to identify were those candidates who controlled their impulses through suppression of their feelings, but who later became unhappy in their job. The present study has provided a method by which these latter men can also be identified before employment.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

It was concluded from the results of this study that the hypotheses as set down in Chapter I have been supported. The personal history factors in the pre-employment documents of the Edmonton City Police Department can identify high-level and low-level policemen as defined by job performance. Certain of these items contributed more to discrimination of criterion performance groups than others. A selection of these items from the original set of variables was made on the basis of their ability to decrease misclassification of high-level and low-level groups. This resulted in a reduced number of items in the predictive equations without loss in discriminative power. In most cases the overall efficiency was increased.

Predictive validation of the selection procedure used during the four years of this study has been retrospectively established. A method has been produced whereby the quality of police performance as measured by supervisor's assessment can be increased by using the predictive equations scores for classification of new applicants. The efficiency of this method is a function of the supply of applicants, the number of recruits required, and the urgency of fulfilling positions.

The advantages of a predictive equation composed of a relatively few items is apparent in terms of efficiency and economy.

Furthermore, it can be readily adapted to the present selection procedure, and can be administered and interpreted by the personnel staff themselves by following simple instructions and rules for scoring.

Disadvantages of relying on such a predictive instrument should be mentioned also. A certain number of actually high-level policemen will be rejected, and a proportion of middle-level policemen will be accepted who cannot be discriminated from high-level policemen. Exclusive use of predictive equations could also result in the systematic elimination of candidates who do not fit the HL group pattern, but who may have specific potentials (e.g., detective).

The consistency of annual performance ratings over years was established. This indicated there was agreement among raters about the attributes being assessed on the rating form, as well as the quality of performance of a given policeman. It also suggested that the criterion performance ratings of each policeman did not vary greatly over time (i.e., high-level policemen tended to consistently give high-level criterion performance, and low-level policemen to give low-level criterion performance). The qualities being assessed appeared to be stable over the four year period.

A preliminary investigation revealed that of the entire sample in this study only 11% left the force, either at the request of the department or of their own volition. This is a commendably small rate of employment termination when compared with the 45% recorded in Levy's (1967) study. Supporting the above conclusion that the policemen were resistant to change in performance due to the

cumulative effects of the job over years was the finding that 58% of the job terminations occurred within the first year of hire, while only 12% occurred in the fourth year. Unsuitability and dissatisfaction were detected in the early stages of employment rather than in the later ones. Of note also was the low rate (2%) of terminations among the high-level policemen. These findings tend to confirm the contention that, among the constable ranks at least, critical attributes of good policemen as defined by the criterion are possessed before hire and not developed after.

It is recommended that until further scientific investigation can be carried out the use of the predictive equations herein developed be restricted to a research implement. Knowledge about predictive scores on newly recruited policemen can result in contamination of the criterion performance ratings. Awareness of best predictors may influence selecting officers to place more emphasis on them their usual practice, thus biasing their selection decision in the direction of the results of this study. Considerations and recommendations for future research are suggested as follows:

1. A cross-validation study should be carried out on a different sample of policemen using the predictive equations derived from this study to control for chance errors of discrimination among the criterion performance groups.

2. Other sources of rating of police performance should be investigated, such as peer and community assessments.

3. Other sources of prediction of job performance should be explored, such as psychological, situational, and stress testing.

4. The results of this study are confined to local standards of selection and job assessment of the Edmonton City Police Department. Validity studies must first be done in other police forces before the generality of this predictive method can be established.

5. A similar study using personal history factors to validate selection for specific key occupations within the force such as supervisory and command positions would be of value, particularly to find if they are chosen from among the members of the high-level criterion group.

REFERENCES

Adams, T.F. Law Enforcement: An Introduction to the Police Role in the Community. Engelwood, N.J.: Prentice Hall, 1968.

Baehr, M.E., Furcon, J.E., and Froemel, E.C. Psychological assessment of patrolman qualifications in relation to field performance. Washington D.C., U.S. Gov't. Printing Office, 1968.

Brandstatter, A.F. and Radelet, L.A. Police and Community Relations: A Sourcebook. California: The Glenco Press, 1968.

Brown, Roger. Social Psychology. New York. The Free Press, 1965, p. 505.

Chenowith, James H. Situational tests - a new attempt at assessing police candidates. Journal of Criminal Law, Criminology, and Police Science, 1961, 52, 232-238.

Cohen, Bernard, and Chaiken, Jan M. Police background characteristics and performance, 1972. Report prepared for the National Institute of Law Encorcement and Criminal Justice. The New York Rand Institute.

Colarelli, Nick J. and Siegel, Saul M. A method of Police Personnel selection. Journal of Criminal Law, Criminology, and Police Science, 1964, 55(2), 287-289.

Diehle, H.S., Paterson, D.G., Dvorak, B.J., and Longstaff, H.P. A personnel study of Duluth policemen. Bulletins of the Employment Stabilization Research Institute, University of Minn., Vol. II, No. 2, May, 1933.

Doll, R.E. The development and evaluation of fake detection keys for a biographical inventory using subtle and unsubtle fake set

criteria. Unpublished doctoral dissertation, University of Utah, 1969.

DuBois, P.H. and Watson, R.I. The selection of patrolmen. Journal of Applied Psychology, 1950, 34, 90-95.

Dudycha, G.J. Psychology for Law Enforcement Officers. Springfield, Ill., Charles C. Thomas, 1955, pp. 42-46.

Dunnette, M.D. Personnel Selection and Placement. Belmont California, Wadsworth, 1966.

Frost, T.M. Selection methods for police recruits. Journal of Criminal Law, Criminology, and Police Science, 1955, 46, 135-145.

Furcon, John. A Longitudinal Study of Psychological Test Predictors and Assessment of Patrolman Field Performance, 1971. Report submitted to National Institute of Law Enforcement and Criminal Justice Law Enforcement Assistance Administration.

Gottesman, Jay. Personality patterns of urban police applicants as measured by the MMPI. Unpublished manuscript, Stevens Institute of Technology, Sept., 1969.

Hammond, K.R. Evaluating performance of state highway patrolmen. Traffic Digest, 1960, 1-6.

Holmes, B. Selection of Patrolmen. Journal of Criminal Law, Criminology, and Police Science, 1942, 32, 575-592.

Leiren, Bjorn D., Kiker, Vernon L., and Phelan, Joseph G. Validating the selection of Deptuy Marshals. Proceedings, 79th Annual Convention, APA, 1971.

Leonard, V.A. Police Organization and Management. Brooklyn: The Foundation Press, 1951.

Levy, Ruth J. Predicting police failures. Journal of Criminal Law, Criminology, and Police Science, 1967, 58, No. 2, 275.

Levy, Ruth J. Can high-risk police applicants be identified? July, 1971. Institute for Local Self Government, Hotel Claremount Bldg., Berkeley, California, 94705.

Mandel, Kay. The predictive validity of on-the-job performance of policemen from recruitment selection information. University of Utah, Ph.D., 1970.

Marsh, S.H. Validating the selection of deputy sheriffs. Public Personnel Review, 1962, 23, 41-44.

Martin, Edward M. An aptitude test for policemen. Journal of Criminal Law, Criminology, and Police Science, 1923, 24, 14, 376-404.

McConnell, Wm. A. Relationship of personal history to success as a police patrolman. Unpublished Master's Thesis, Colorado State University, Jan., 1967.

Mills, Robert B. New Directions in Police Selection. Presented in a Symposium, Profile of the U.S. Police Officer. Annual Convention of American Psychological Association, Honolulu, Hawaii, Sept. 7., 1972.

Mullineaux, J.E. An evaluation of the predictors used to select patrolmen. Public Personnel Review, 1955, 16, 84-86.

Niederhoffer, A. Behind the Shield: The police in Urban society. N.Y., Doubleday, 1967.

O'Rourke, L.J. Partially standardized test for patrolmen. Public Personnel Studies, 1926, 4, 122.

Perkins, R.M. Elements of Police Science: Police Science Series. Chicago: The Foundation Press, 1942.

Rankin, James H. Psychiatric screening of police recruits. Public Personnel Review, 1959, 20, 191-196.

Rhead, C., Abrams, A., Trosman, H., and Margolus, P. The Psychological Assessment of Police Candidates. American Journal of Psychiatry, 1968, 124, 135.

Smith, B. The State Police. Montclair, N.J., Patterson Smith, 1925.

Spencer, Gilmore and Nichols, Robert. A study of Chicago police recruits: Validation of selection procedures. Police Chief, 1971, 38(6), 50-55.

Taylor, C.W., Ellison, R.L., and Tucker, M.F. Biographical information and predictor of multiple criteria of success in science. Unpublished Manuscript, University of Utah, 1965. (In Mandel [1970])

Taylor, C.W. and Ellison, R.L. Predictors of scientific performance. Science, 1967, 155, 1075-1079.

Terman, L.M. A trial of mental and pedagogical tests in civic service examination for policemen and firemen. Journal of Applied Psychology, 1917, 1, 17-29.

Vollmer, August. A practical method of selecting policemen. Journal of Criminal Law, Criminology, and Police Science, 1921, 11, 571-581.

Wilson, O.W. Police Administration. New York: McGraw Hill, 1950.

APPENDIX A

Levy's (1971) Pre-employment Variables Most Frequently Used in Her Predictive Model for Departure of Policemen from the Force.

Table 1

Empirically Derived Variables
Most Frequently Used In Predictive Model

Current	Failure	Non-Failure
Many yrs in Calif	Few yrs in Calif	Few yrs in Calif
Less education	Jobs	More education
Has been in Navy	Tatooed	Navy
Not a sworn p.o.	Sworn p.o.	Older
Not divorced	Discharged from job	

Example of a discriminant equation (empirical):

Current score= 2 (yrs al) + 5 (if Navy) - 4 (yrs ed)

Table 2

Logically Derived Variables
Most Frequently Used In Predictive Model

Current	Failure	Non-Failure
Born in city	Youngest sibling	Oldest sibling
No neg recommendations	Neg recommendations	No neg recommendations
No bad application	Bad Application	Juvenile penals
No broken home	Broken home	No adult penals
No low mil rank	Low military rank	Jr. after name
Not 21 or 22	21 or 22 yrs old	Many residences
Few residences	Has GED	Father is sworn peace officer
No 'Service to Mankind'	'Service to Mankind'	
Not failed other p.d. exams	Failed other p.d. exams	
	Parent dead	
	Dishonors	
	Has child at young age	

Example of a discriminant equation (logical):

Current score= score from empirical equation +
9 (brn in city) - 12 (bad appl)

APPENDIX B

Application Questionnaire (Form I)

THE CITY OF EDMONTON
POLICE DEPARTMENT

APPLICATION QUESTIONNAIRE

NOTE: STUDY EACH QUESTION CAREFULLY. ANSWER FULLY. FOLLOW DIRECTIONS EXACTLY. IF NOT SATISFACTORILY FILLED OUT, THIS APPLICATION MAY BE REJECTED ON THE GROUNDS OF INCOMPLETENESS OR INABILITY TO FOLLOW DIRECTIONS.

FILL OUT IN YOUR OWN HANDWRITING.

USE INK.

If insufficient space, put number of question at top of extra sheet of paper and attach to questionnaire.

1. Full Name_____

2. Complete and exact address_____

3. Age_____ Date of Birth_____ Where Born_____

4. Height, in bare feet_____

5. Weight, stripped_____

6. British Subject:
   Canadian Citizen: YES_____ NO_____ BY BIRTH_____
   If by naturalization, quote number of certificate, where issued and date, place of birth and previous citizenship:

   _____

   _____

7. Do you have any relatives in employ of the City of Edmonton? If so, who?

   _____

8. Are you acquainted with any members of the Edmonton City Police Department? If so, who?

   _____

   _____

9. Have you ever, during your life time, been arrested or summoned or otherwise required to appear in a Court of Law to answer to any charge?

   YES_____ NO_____

10. If arrested, summoned or otherwise required to appear in any Court to answer to any charge, complete details immediately hereunder.

CHARGE	DISPOSITION	CITY	PROVINCE	DATE

11. Do you wear eye glasses?

12. Have you ever been advised to wear eye glasses?

13. In space below, give addresses for past 10 years, starting with present address at top and going backwards.

RESIDENCE OF PAST TEN YEARS

Date From	to	City	Prov.	Street Address	Name and address of person rented from

14. Give occupations for the past 10 years. Use space below. Start with present or more recent position and go backwards:

EMPLOYMENT HISTORY

Firm Name	Kind of Business	Street Address	Date Started and Salary	Date Quit and Salary	Reason for Leaving	Promotions, Duties, Advancements, Demotions.

15. In what positions were you most proficient?

16. What position did you like best?

Why?

17. What occupation did you dislike?

Why?

18. Name any trades you have:

19. Name any hobbies you have:

_____

_____

FINANCIAL HISTORY

20. (a) Is your life insured?_____ For what amount?_____

(b) Have you a savings account?_____

(c) Have you investments in stocks, bonds, etc.?_____

(d) Do you own or are you buying your own home?_____

(e) Do you own or are you buying any other real estate?_____

In space below, explain anything you care to, concerning the answers given above.

_____

_____

_____

21. Have you any income other than the salary which you are presently receiving in consequences of your employment? YES_____ NO_____.
Give such detail as you may desire.

_____

_____

22. How many persons are dependent upon you for support?_____

23. In the space below, list all of the firms which you now have or have had charge accounts. Start at the top with those active at present:

CREDIT HISTORY

Firm Name	Type of Business	Street Address	City	Amount	Date Opened	Date Closed

24. What is your total indebtedness at present?_____

25. Have you ever purchased an automobile on the contract plan? If answer is in the affirmative, give the name of dealer, date purchased, and name of Finance Company:

_____

_____

26. Does your total indebtedness include the financing of an autombile?

YES_____ NO_____

27. Have your creditors treated you fairly?_____

28. Have you ever been sued in Court for any accounts?_____

29. Have your employers usually treated you fairly?_____

30. Do you know of any person whose animosity may be aroused if you become a member of the Edmonton Police Department or who may in any manner try to injure you or jeopardize your employment. If so, give details hereunder:

31. Does the sight of blood nauseate you?_____

32. Can you stand disgusting sights?_____

33. Can you stand disgusting smells?_____

34. Can you stand pain and hardships quietly?_____
Upon what experience do you base your answers to questions, 30, 31, 32, and 33?

35. Do you smoke tobacco?_____ Chew tobacco or snuff?_____

36. Do you drink intoxicating liquors?_____ In excess?_____

37. With what gambling games are you familiar?

38. Do you object to wearing a uniform?_____

39. Do you object to working nights?_____

40. If married - does your wife object to you working nights?_____

41. Do you read much?_____
If answer is in the affirmative, list briefly the type of literature and the approximate number of hours spent weekly in reading.

42. Have you knowledge of First Aid?_____
If answer is in affirmative, list experience and training.

43. Can you swim?_____ Degree of Proficiency_____

44. Have you had any training in Boxing?_____ Judo?_____
If answer in affirmative, give details.

_____

_____

45. Have you knowledge of foreign languages in the matter of speaking or reading?

_____
If answer in the affirmative, list languages spoken and degree of proficiency, also list languages which you can read.

_____

_____

_____

46. Can you operate an automobile?_____ Years of driving?_____

Approximate mileage driven_____

47. Can you operate a Motorcycle?_____

48. Have you ever been involved in a motor accident?_____
If so, give detailed information and how matter was settled.
(Please answer on the back of this page.)

49. Do you hold a current operators or chauffeur's license?_____

Province	Date Issued	Number

_____

50. In an emergency are you qualified to operate a Police Radio Broadcasting Station_____ A telephone switchboard_____.
List qualifications hereunder:

_____

_____

51. What positions have you ever held which required supervisory or executive ability, the exercise of authority, and the ability to lead and control men?

_____

_____

52. At the present time, have you an application pending for any other position or positions?_____ If answer is in the affirmative, give information as you may care to disclose.

_____

_____

_____

_____

_____

53 A. Have you ever served in the Army, Navy, or [illegible]orce or other military or semi-Military organizations, such as cadets, etc. If so, list details hereunder:

Unit	Date Enlisted	Rank on Enlistment	Date of Discharge	Rank at Discharge	Active Service

53 B. Have you ever served in any police force?_____ If answer is in the affirmative give name of the force and period of service.

54. During such service, was disciplinary action directed against you?_____ If answer in the affirmative give details.

55. Are you now a member of any Reserve Unit of Her Majesty's Forces?_____ If answer in the affirmative, give details.

56. What experience have you had with firearms? (Explain in detail).

57. If married
Wife's maiden name_____

When and where married_____

Number and ages of children_____

If separated or divorced give details_____

SCHOOL ATTENDANCE RECORD

	Names of School	City	Prov.	Age Started	Age Finished	Name of Principal
GRAMMAR OR PUBLIC SCHOOL						
JUNIOR HIGH SCHOOL						
HIGH SCHOOL						
UNIVERSITY OR COLLEGE						
NIGHT SCHOOL, EXTENSION OR CORRESPONDENCE COURSES						

Submit original or certified copies of diplomas or certificates which you received, listing detail hereunder:

59. What grade of Education did you attain before leaving school?_____

60. Can you typewrite?_____ Touch or Sight_____ W.P.M._____

61. Can you take shorthand?_____ System_____ W.P.M._____

62. What school subject were most difficult?_____

63. What school subject did you like best?_____

64. Was studying easy or difficult for you?_____

Explain_____

65. What prompts you to make the application?_____

66. Have you any special interest in police work? If so, specify in detail.

67. Have you any special training, experience or ability which you think would be of value to police work?_____

68. To what Fraternal Organizations do you belong?_____

69. To what Commercial Organizations do you belong?_____

Have you held office?_____ If so, give details_____

70. To what Labour Organizations do you belong?_____

Have you held office?_____ If so, give details_____

71. Are you at the present time, or have you ever been a member of the Communist Party or the Labour Progressive Party, or any organization affiliated in any way with either the Communist or Labour Progressive Party?_____

If answer is in the affirmative, give details:_____

_____

72. In addition to the information requested herein, it is necessary to submit with this application the following:

(a) Certified copy of your birth certificate or original copy. This can usually be obtained from the Department of Vital Statistics at the Capital of the province in which you were born.
(b) Photograph, photostatic or original of High School Diploma.
(c) Personal photograph. This must be FULL LENGTH, clear and not less than 4" x 5" or more than 8" x 10". An enlarged snapshot is satisfactory. Photo must have been taken within past twelve months.
(d) A certified copy or the original of any armed services discharge certificate covering your service in any unit of Her Majesty's Forces.
(e) A certified copy or the original of any character references or other form of reference that you may hold.

NOTE: If your application is not accepted, all documents submitted by yourself will be returned excepting those which may be in the form of a letter or certificate signed by the person submitting and addressed or directed to the Chief Constable, Edmonton Police Department.

73. It is understood by me that if accepted into the City of Edmonton Police Department, that my engagement will be on a probationary basis for a period of one year from date of engagement. At any time during this probationary period I may be released should the Executive Officers of the Police Department have reason to believe that I will not become a fit or suitable member of the Department.

74. Do you understand that a false statement made herein may, if you are employed by the Edmonton Police Department, and discovered subsequent to such employment, may result in your dismissal without notice or other cause?_____

75. After having answered all of the foregoing questions and having carefully checked your answers, write on the reverse side of this page the names and addresses of three persons NOT RELATED TO YOU AND NOT FORMER EMPLOYERS, who have known you intimately for a period in excess of five years. All of the persons whom you have named herein may be asked to appraise your character, ability, experience and other qualities.

76. This application, together with documents mentioned in paragraph 72 and elsewhere, should be MAILED to the CHIEF CONSTABLE, CITY OF EDMONTON POLICE DEPARTMENT, EDMONTON, ALBERTA.

I hereby certify on my honour that I have personally completed in my own handwriting this application consisting of pages one to eight inclusive and that the answers which I have recorded are true and correct to the best of my knowledge.

_____
SIGNATURE OF APPLICANT

DATE AT_____

IN THE PROVINCE OF_____

THIS_____ DAY OF_____

IN THE YEAR A.D. 19_____

APPENDIX C

Application Questionnaire (Form II)

601 0930

THE CITY OF EDMONTON – POLICE DEPARTMENT

APPLICATION FOR ENGAGEMENT

TO BE COMPLETED IN DUPLICATE WITH TYPEWRITER OR PRINTED WITH PEN AND INK.
IF INSUFFICIENT SPACE FOR ANY QUESTION, USE SEPARATE SHEET. FORWARD TO:
THE CHIEF CONSTABLE
THE CITY OF EDMONTON POLICE DEPARTMENT
EDMONTON 15, ALBERTA

S.I. NO.

Personal Documents required with this Application:
1. Original Birth Certificate
2. Recent Full Length Photograph
3. High School Diploma or Certificate of Marks.

1. FULL NAME (SURNAME FIRST)	2. PRESENT ADDRESS

3. TELEPHONE NO.	4. BIRTH DATE	5. BIRTH PLACE	6. HEIGHT (Without Shoes)	7. WEIGHT (Stripped)	8. SEX

9. HAVE YOU EVER BEEN INVOLVED IN A MOTOR VEHICLE ACCIDENT? YES ☐ NO ☐ IF YES, EXPLAIN ON SEPARATE SHEET OF PAPER.	10. NAT. LANGUAGE	11. LGTH. RESIDENCE IN CANADA	12. CDN. CITIZEN BORN ☐ NAT. ☐	13. BR. SUBJECT BORN ☐ NAT. ☐

14. MARITAL STATUS	15. DATE MARRIED	16. NAME AND ADDRESS OF NEXT OF KIN AND RELATIONSHIP

17. DEPENDENTS - NAMES	AGE	SEX

18. HAVE YOU A VALID UNRESTRICTED CANADIAN LICENCE TO OPERATE A MOTOR VEHICLE? IF YES, INDICATE PROVINCE AND NUMBER.
YES ☐ NO ☐

19. IF NO, IS IT SUSPENDED?
YES ☐ NO ☐

20. IF SUSPENDED, WHY?

21. HAVE YOU BEEN CHARGED WITH A CRIMINAL, TRAFFIC OR OTHER OFFENCE? (THIS IS TO INCLUDE ANY OFFENCE FOR WHICH A VOLUNTARY PENALTY HAS BEEN PAID). YES ☐ NO ☐ IF YES, GIVE DETAILS. (WHEN, WHERE, NATURE OF OFFENCE, PENALTY).

22. HAVE YOU EVER PREVIOUSLY APPLIED FOR ENLISTMENT IN ANY ARMED SERVICE, RCMP, THIS OR ANY OTHER POLICE FORCE AND BEEN REJECTED? YES ☐ NO ☐ IF YES, GIVE DETAILS. (WHEN, WHERE, NAME OF ORGANIZATION, REASON FOR REJECTION.)

23. HAVE YOU SERVED IN THE ARMED FORCES OR ANY POLICE FORCE? YES ☐ NO ☐ IF YES,
NAME OF FORCE:
REASON FOR LEAVING:
DATES OF SERVICE:

24. AT PRESENT ARE YOU AN APPLICANT FOR ANY OTHER POSITION(S) YES ☐ NO ☐ IF YES, EXPLAIN.

25. LIST TECHNICAL, PROFESSIONAL OR TRADE QUALIFICATIONS; KNOWLEDGE OF FIRST AID; TRAINING IN BOXING OR JUDO, DEGREE OF PROFICIENCY IN SWIMMING.

26. HAVE YOU ANY INCOME OTHER THAN YOUR PRESENT SALARY? YES ☐ NO ☐ IF YES, EXPLAIN.

27. ARE YOU A MEMBER OF ANY ORGANIZATION OR UNION OF EMPLOYEES? YES ☐ NO ☐ IF YES, GIVE NAMES.

28. HAVE YOU ANY DEBTS? YES ☐ NO ☐ IF YES, GIVE NAMES AND AMOUNTS.

29. HAVE YOU EVER BEEN SUED IN COURT FOR ANY ACCOUNTS? YES ☐ NO ☐ IF YES, EXPLAIN.

30. DO YOU WEAR EYE GLASSES, CONTACT LENSES OR ARE YOU COLOR BLIND? YES ☐ NO ☐ IF YES, EXPLAIN.

31. CAN YOU SPEAK LANGUAGES OTHER THAN ENGLISH? YES ☐ NO ☐ IF YES, LIST.

32. WHAT WAS THE LAST GRADE WHICH YOU SUCCESSFULLY COMPLETED AT SCHOOL?

33. HAVE YOU EVER SUFFERED ANY SERIOUS ILLNESS? YES ☐ NO ☐ IF YES, GIVE DETAILS.

34. LIST SCHOLASTIC COURSES TAKEN SINCE LEAVING SCHOOL.

35. LIST THE SCHOOLS ATTENDED DURING YOUR LAST THREE SCHOOL YEARS:

NAME OF SCHOOL	TOWN OR CITY AND PROVINCE	FROM DATE (MO. & YR.) TO

36. STARTING WITH PRESENT EMPLOYMENT, LIST ALL EMPLOYMENT DURING LAST 10 YEARS. INCLUDE SUMMER AND/OR PART TIME WORK.

EMPLOYERS NAMES AND ADDRESSES	TYPE OF WORK	FROM DATE (MO. & YR.) TO

37. LIST YOUR PLACES OF RESIDENCE DURING THE PAST 10 YEARS.

STREET ADDRESS	TOWN OR CITY AND PROVINCE	FROM DATES (MO. & YR.) TO

38. LIST FULL PARTICULARS RESPECTING YOUR FATHER, MOTHER, BROTHERS, SISTERS, HALF BROTHERS, HALF SISTERS, STEP RELATIVES AND IN LAWS. IF DECEASED STATE SO AFTER NAME.

	FULL NAME (SURNAME FIRST)	RELATIONSHIP	COUNTRY OF BIRTH	FULL BIRTH DATE
a				
b				
c				
d				
e				
f				
g				
h				
i				
j				
k				
l				
m				

39. FULL ADDRESS OF RELATIVES LISTED ABOVE.	NAME AND ADDRESS OF EMPLOYER.
a	
b	
c	
d	
e	
f	
g	
h	
i	
j	
k	
l	
m	
n	

40. NAME THREE ADULT CHARACTER REFERENCES NOT RELATED TO YOU, WHO ARE CANADIAN CITIZENS OR BRITISH SUBJECTS AND ARE NOT PREVIOUS EMPLOYERS OR EDUCATORS OF YOURSELF. (NAME AND ADDRESS)

41. IF YOU WERE BORN OUTSIDE CANADA, PLEASE SHOW.

Date of arrival _____

Method of arrival (ship or aircraft) _____

Port of entry _____

Point of Embarkation for Canada _____

Citizenship (Cr. Subject or alien) _____

If naturalized, give certificate number & date of issue _____

42. IF YOU HAVE ANY RELATIVES IN THE EMPLOY OF THE CITY OF EDMONTON, GIVE NAMES AND RELATIONSHIP

43. IF YOU ARE ACQUAINTED WITH ANY MEMBERS OF THE EDMONTON CITY POLICE FORCE GIVE NAMES.

IT IS UNDERSTOOD BY ME THAT IF ACCEPTED INTO THE EMPLOYMENT OF THE CITY OF EDMONTON POLICE DEPARTMENT THAT I WILL BE ENGAGED ON A PROBATIONARY BASIS AND THAT AT ANY TIME DURING MY PROBATIONARY PERIOD I MAY BE RELEASED SHOULD THE EXECUTIVE OFFICERS OF THE POLICE DEPARTMENT SO DETERMINE. FURTHER, I HEREBY CERTIFY ON MY HONOR THAT THE INFORMATION SET OUT BY ME IN THIS DOCUMENT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

DATE

SIGNATURE OF APPLICANT

APPENDIX D

Applicant's Education Test

FULL NAME_____

THE CITY OF EDMONTON POLICE DEPARTMENT

APPLICANT'S EDUCATION TEST

No. 1

INSTRUCTIONS - READ CAREFULLY.

THERE IS A TIME LIMIT OF TWO HOURS FOR THIS TEST. THE TIME IS YOURS SO DO NOT RUSH AND THEREBY OVERLOOK IMPORTANT ITEMS. YOU DO NOT RECEIVE ANY CREDIT FOR FINISHING EARLY.

MARKS ALLOTTED FOR EACH QUESTION ARE NOTED IN THE MARGIN. THE POSSIBLE ON THIS TEST IS 100 MARKS. YOU REQUIRE 60 MARKS TO PASS. YOU MUST ALSO RECEIVE 50% OF THE MARKS GIVEN FOR EACH SUBJECT IN ORDER TO PASS.

ONLY THE ANSWERS TO THE QUESTIONS SHOULD BE WRITTEN IN THE SPACE PROVIDED. USE THE BLANK SHEETS OF PAPER PROVIDED FOR YOUR ROUGH WORK.

THE SHEETS CONTAINING YOUR ROUGH WORK MUST ALSO BE TURNED IN WITH THE TEST.

THE ESSAY (Question No. 10) IS TO BE WRITTEN ON A SHEET OF FOOLSCAP PAPER.

MATHEMATICS:

1. If your annual salary is $4,212.00, your personal Income Tax exemption $1,000.00 per annum and you were deducted 15% of your taxable salary for Income Tax and 5% of your annual salary for pension and 1% for Unemployment Insurance. What would be the amount of your monthly take home pay? 5

_____

2. Floor tiles are 9 x 9 inches square. You wish to cover the floor of a room which is 11 feet 6 inches wide and 18 feet long. How many complete tiles would you be required to purchase? 5

_____

3. Cartridges cost retail $5.00 for boxes of 30. The wholesale cost is $3.70 a box plus 55¢ a hundred cartridges - shipping charges. How much is saved if 600 cartridges are purchased wholesale? 5

_____

4. A patrol car had 9 gallons of gas at the beginning of a trip and 4 at the end. During the 289 mile trip, 12 gallons were added. How many miles were obtained per gallon? 2

_____

5. There were 9 arrests for drunkenness on Friday, 4 times as many on Saturday and ½ as many on Sunday as on Saturday. How many arrests were made on Saturday and Sunday? 2

_____

6. In a raid, police seized 1 3/4 pounds of heroin valued at $150.00 an ounce. What was the total value of the heroin? 1

_____

****

LANGUAGE:

These are multiple choice questions, there are no catch questions, the correct
7. answer is one of those shown. Do not guess at the answer. Place a circle around the A, B, C, D or E, whichever you consider correct.

(a) If a person is CONVICTED it means most nearly that he has been:

A. set free B. found guilty by the court C. arrested D. imprisoned

(b) If a man is under SURVEILLANCE by the police he:

5 A. is being watched closely B. is suspected in a crime C. is being held for questioning D. has been freed until the time of trial

(c) The CALIBER of a bullet refers to its:

A. length B. head C. diameter D. base E. point

(d) An EXHAUSTIVE investigation is one that is:

A. illegal B. fruitless C. thorough D. tiresome

(e) To say that a person should be EXONERATED means most nearly that he should be:

A. blamed B. released C. implicated D. absolved E. convicted

****

Each of these questions is either entirely correct or contains ONE error in
7(a) grammar. If the sentence is entirely correct, place a "C" on the line opposite. If it is incorrect, write the correct word on the line opposite the sentence.

(a) To whom did the officer write the letter of recommendation? _____

(b) When your reading gives you a new word, be sure you understand it's meaning. _____

(c) If a commander gets involved in details, Montgomery wrote in his Memoirs, he will
5 loose sight of the essentials which really matter. _____

(d) He has went to the police station to receive his equipment. _____

(e) It is we patrolmen who protect society. _____

****

In the following paragraph, a number of incorrect words and punctuation marks have been used. Re-write the paragraph in the same form, making the necessary corrections in words and punctuation marks.

8. Many employees are injured because of there own carelessness. Us who are supervisors try hard to give instructions on safety precautions but it seem's to have little affect. This is no miner problem but a major concern to management! Their appears to be little concern between the many technicians which leave hazardous equipment laying around the shop were unskilled hands can tampor with it. On Friday I seen one technician leave an electric power drill on the work bench. Without shutting of the power he left the shop for coffee. I attended the drill and upon his return asked him why he had did that? He replied, "My helper was supposed to be around, me and him are the only one's who use this work bench." Too many of these incidence could cause our compensation rates to be increased.

****

GENERAL KNOWLEDGE:

9. (a) Which parallel of latitude forms nearly half of the boundary between Canada and the United States?_____

(b) What standard time zone does Edmonton come within?_____

20

(c) To what country or countries does the St. Lawrence seaway belong?

_____

(d) Are Senators in the Canadian Federal Government appointed by the Government or elected by the people?_____

(e) What political party forms the present Government of Alberta?

_____

(f) What political party forms the present Government of Canada?

_____

(g) What positive means of identifying individuals, is used by all Police Forces?_____

(h) Is Hong Kong: a part of Communist China, a British Colony or a part of Nationalist China?_____

(i) In what City is the headquarters of the United Nations Assembly located?

_____

(j) Name the two British Commonwealth countries that because of their location on the earth's globe are referred to as being the countries "Down-Under" ____ _____

(k) Name the present Prime Minister of Great Britain_____

(l) Who is the Governor-General of Canada?_____

(m) What planet is closest to the earth?_____

(n) Name the continents of the world_____

_____

(o)(1) What is the name given to the largest group of fresh water lakes in the world?_____

(2) Where are they located?_____

(3) Name each lake_____

(p)(1) Name the Maritime provinces of Canada_____

_____

(2) Following the same order as you have listed the Maritime provinces, name their capital cities_____

_____

(q) In what position does the Dominion of Canada rank in area among the largest countries of the world?_____

****

COMPOSITION - ESSAY:

10. Write an essay of NOT LESS THAN 175 words, on why you wish to join the City of Edmonton Police Department, also outlining any reasons you may have for believing that you will make a suitable policeman. 20

****

SPELLING:

11. Twenty words to be dictated to the applicant. 20

1. _____ 11 _____

2. _____ 12. _____

3. _____ 13. _____

4. _____ 14. _____

5. _____ 15. _____

6. _____ 16. _____

7. _____ 17. _____

8. _____ 18. _____

9. _____ 19. _____

10. _____ 20. _____

****

FOR DEPARTMENT USE ONLY

MARKS OBTAINED:

MATHEMATICS	_____
LANGUAGE	_____
GENERAL KNOWLEDGE	_____
COMPOSITION	_____
SPELLING	_____
TOTAL	_____

WITNESSED AND MARKED BY:

_____

Date: _____

APPENDIX E

Applicant's Personal History Sheet

THE CITY OF EDMONTON POLICE DEPARTMENT

APPLICANT'S PERSONAL HISTORY SHEET

* * * * *

DATE _____

NAME _____ BIRTH DATE _____

RELIGION _____ RACIAL ORIGIN _____ MARITAL STATUS _____

MAIDEN NAME OF WIFE _____ WHERE MARRIED _____

FAMILY BACKGROUND: (Good Family Relationships: Happy Homelife: Family In Favour Of Application).

EDUCATIONAL BACKGROUND: (Grades Failed: Last Grade Successfully Completed: Diplomas Or Certificates Received: Attendance At University: Additional Special Courses: Best Subjects: Poorest Subjects: Reason For Leaving School: Typing Or Shorthand Qualifications).

WORK HISTORY: (Part Time Or Vacation Employment While At School: Jobs Held Since Leaving School And Reasons For Termination Of Employment: Jobs Liked Or Disliked).

PERSONAL: (Use Of Tobacco And/Or Intoxicating Liquor: Ability To Stand Hardships, Disgusting Sights Or Smells: Possible Objection To Shift Work: Special Qualifications Or Experience In Any Field).

MILITARY OR POLICE BACKGROUND: (Name Of Force, Dates Of Service, Ranks Held, Reasons For Leaving, Medals Or Decorations, Conduct Rating On Discharge).

SOCIAL ADJUSTMENT: (Clubs And Associations: Sports And Athletics: Hobbies: Steady Girl Friend: Recreation).

ECONOMIC ADJUSTMENT: (Debts: Savings: Insurance: Investments Or Any Other Convertible Assets).

HEALTH ADJUSTMENT: (Diseases: Injuries: Operations: History Of Disease Such As T.B. or Mental Illness In Family).

APPRAISAL: (Without Restricting Other Areas, Cover Specifically The Degree Of Ability (Physical And Academic), Stability, Motivation And Maturity).

APPENDIX F

Personal History Form (Confidential)

PERSONAL HISTORY FORM

CONFIDENTIAL
(When completed)

1. ALL INFORMATION GIVEN IN COMPLETING THIS FORM WILL BE CONSIDERED IN STRICT CONFIDENCE BY THE CITY OF EDMONTON POLICE DEPARTMENT
2. ALL INFORMATION SUPPLIED IS NORMALLY SUBJECT TO VERIFICATION BY INVESTIGATION
3. COMPLETE THIS FORM BY PRINTING IN BLOCK LETTERS OR BY TYPEWRITER
4. ILLEGIBLE OR INCOMPLETE FORMS WILL NOT BE CONSIDERED
5. IF EXTRA SPACE IS REQUIRED, ADD SHEET TO THIS FORM AND NUMBER ANSWERS APPROPRIATELY
6. FALSE STATEMENTS OR OMISSIONS MAY BE CONSIDERED AN OFFENCE UNDER SECTION 5 OF THE OFFICIAL SECRETS ACT

1- SURNAME (Mrs., Mrs., Miss or Rank) | GIVEN NAMES (IN FULL) | NICKNAME

2- DATE OF BIRTH (DAY, MONTH, YEAR) | CITY, PROVINCE AND COUNTRY OF BIRTH | 3- NATIONALITY

4- INDICATE ANY CHANGES OF NAME OTHER THAN BY MARRIAGE — FROM | TO | DATE (DAY, MONTH, YEAR) | PLACE | CHANGED (BY WHAT AUTHORITY)

5- IF A MARRIED PERSON GIVE MAIDEN NAME OF WIFE OR HUSBAND'S NAME WITH DATE AND PLACE OF MARRIAGE, STATE IF COMMON-LAW — SURNAME | GIVEN NAMES (IN FULL) | DATE OF MARRIAGE (DAY, MONTH, YEAR) | CITY, PROVINCE AND COUNTRY | NATIONALITY | PREVIOUS NATIONALITY | DATE OF ARRIVAL IN CANADA, IF APPLICABLE

6- PARENTS OF YOUR WIFE OR HUSBAND (IF DECEASED, GIVE DATE OF DEATH AND LAST ADDRESS WHILE LIVING)

	NAME IN FULL (NO INITIALS) SURNAME	GIVEN NAMES	DATE OF BIRTH DAY	MONTH	YEAR	CITY, PROVINCE AND COUNTRY OF BIRTH
FATHER-IN-LAW						
A MOTHER-IN-LAW						
B						

	PRESENT ADDRESS	NAME AND BUSINESS ADDRESS OF EMPLOYER	DATE OF ARRIVAL IN CANADA, IF APPLICABLE
A			
B			

7- IF DIVORCED, SEPARATED, OR IF MARRIAGE ANNULLED GIVE THE FULL NAMES OF ALL FORMER SPOUSES WITH THE DATE AND PLACE OF THE DIVORCE, SEPARATION OR ANNULMENT.

8- IMMEDIATE RELATIVES OVER 16 YEARS OF AGE: LIST YOUR WIFE, HUSBAND, SONS, DAUGHTERS, (GIVE MARRIED NAME IF APPLICABLE), FATHER, MOTHER (GIVE MAIDEN NAME), BROTHERS, SISTERS (GIVE MARRIED NAMES IF APPLICABLE), STEP- AND HALF-BLOOD RELATIVES. IF DECEASED, GIVE DATE OF DEATH AND LAST ADDRESS WHILE LIVING.

	NAME IN FULL (NO INITIALS) SURNAME	GIVEN NAMES	RELATIONSHIP	DATE OF BIRTH	CITY PROVINCE AND COUNTRY OF BIRTH
A					
B					
C					
D					
E					
F					
G					
H					
I					
J					

	PRESENT ADDRESS	NAME AND BUSINESS ADDRESS OF EMPLOYER
A		
B		
C		
D		
E		
F		
G		
H		
I		
J		

9- IF YOUR PARENTS NOT BORN IN CANADA, GIVE DATE OF THEIR ARRIVAL IN CANADA IF APPLICABLE | FATHER | MOTHER

10- YOUR ADDRESSES FOR PAST 10 YEARS WITH DATES FROM MONTH AND YEAR GIVEN - PRESENT ADDRESS FIRST

CITY AND PROVINCE (GIVE COUNTRY IF OTHER THAN CANADA)	NUMBER AND ADDRESS	FROM MONTH	FROM YEAR	TO MONTH	TO YEAR
			19		19
			19		19
			19		19
			19		19
			19		19
			19		19
			19		19
			19		19

11- YOUR OCCUPATION DURING PAST 10 YEARS (ACCOUNT FOR TOTAL PERIOD INCLUDING UNEMPLOYMENT, SCHOOL, ETC.) GIVING NAME AND ADDRESS OF PRESENT EMPLOYER FIRST

OCCUPATION	EMPLOYER'S NAME	EMPLOYER'S ADDRESS	FROM MONTH	FROM YEAR	TO MONTH	TO YEAR
				19		19
				19		19
				19		19
				19		19
				19		19
				19		19
				19		19
				19		19

12- HAVE YOU EVER BEEN DISMISSED OR ASKED TO RESIGN FROM ANY POSITION? ☐ YES ☐ NO IF YES, GIVE PARTICULARS

13- GIVE THE NAME OF THE LAST SCHOOL OR UNIVERSITY ATTENDED FULL-TIME | PLACE OF INSTITUTION | PERIOD OF ATTENDANCE: FROM TO

14- IF YOU HAVE SERVED IN THE ARMED FORCES OF CANADA OR OF ANY COUNTRY OTHER THAN CANADA, STATE: COUNTRY | SERVICE | CORPS
UNIT | RANK ATTAINED | SERVICE NUMBER
PERIOD OF SERVICE FROM TO

15- HAVE YOU EVER BEEN CONVICTED OF AN OFFENCE? ☐ YES ☐ NO IF YES, GIVE DATES, PLACES, CHARGES AND SENTENCE, EXCLUDING MINOR TRAFFIC VIOLATIONS BUT INCLUDING COURTS MARTIAL

16- GIVE DATES, COUNTRIES VISITED AND PURPOSE OF TRAVELS MADE TO ANY COMMUNIST-DOMINATED AREAS SINCE JULY 1ST, 1945, EXCEPTING ONLY TRAVEL IN THE SERVICE OF THE CANADIAN GOVERNMENT.

17- LIST 3 CHARACTER REFERENCES, GIVING COMPLETE MAILING ADDRESS, EXCLUDING RELATIVES, FORMER EMPLOYERS AND PERSONS NOT RESIDING IN CANADA

	NAME IN FULL	MAILING ADDRESS
A		
B		
C		

18- FOR COMPLETION BY PERSONS BORN OUTSIDE CANADA OF OTHER THAN CANADIAN PARENTS

MEANS OF ARRIVAL IN CANADA (SHIP, AIRCRAFT & LAND IF BY SEA, GIVE NAME OF VESSEL) | DATE OF ENTRY DAY MONTH YEAR | PORT OF ENTRY

PRESENT NATIONALITY | IF BRITISH SUBJECT, BY ☐ BIRTH ☐ NATURALIZATION

IF NATURALIZED CANADIAN, GIVE CERTIFICATE NUMBER | DATE | PREVIOUS NATIONALITY | IF NOT NATURALIZED, HAVE YOU APPLIED FOR CANADIAN CITIZENSHIP ☐ YES ☐ NO

IF NOT A CANADIAN CITIZEN, GIVE NUMBER, DATE OF ISSUE, ISSUING COUNTRY AND DATE OF EXPIRATION OF LAST OR PRESENT PASSPORT OR CERTIFICATE OF IDENTITY

I CERTIFY THAT MY ANSWERS TO THESE QUESTIONS ARE COMPLETE, TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

DATE _____ SIGNATURE OF APPLICANT OR EMPLOYEE _____

APPENDIX G

Mancard

NAME	REG. No.	ENGAGEMENT DATE	AGE	PHOTOGRAPH

DATE AND PLACE OF BIRTH	RANK ENGAGED AS

HEIGHT	WEIGHT	RELIGION	RACIAL ORIGIN	MARITAL STATUS	CHILDREN

LANGUAGES SPOKEN	PREVIOUS POLICE EXPERIENCE (Name of Force, Location Dates and Rank)

SERVICE IN ARMED FORCES (Rank on Discharge)	PREVIOUS OCCUPATIONS OF NOTE

CHANGE IN RANK			EDUCATION	REMARKS
DATE	TO RANK	G.O. No.	Grade:	
			Degrees:	
			Courses:	

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APPENDIX H

Performance Rating and Review Form

PERFORMANCE RATING AND REVIEW FORM

Reg. No. _____ Rank _____ Name _____

Division: _____
(Branch - Section - Detail - Squad - Etc.)

Annual Rating Period Ending: _____
(Month - Year)

	COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5	COLUMN 6
1. DUTIES (A) QUALITY OF WORK	Excellent	Very Good	Good	Satisfactory	Fair	Poor
(B) QUANTITY OF WORK	Extremely High	Very High	High	Satisfactory	Enough to Get By	Tends to Shirk Duties
(C) KNOWLEDGE OF WORK	Extremely Well Informed	Very Well Informed	Well Informed	Adequate	Fair	Poor
2. APPEARANCE, BEARING, & PERSONAL GROOMING	Very Impressive, Really Stands Out	Impressive, Noticeably Above Requirements	A Little Neater than Requirements	Meets Requirements	Room for Improvement	Careless, Needs Frequent Checking
3. CO-OPERATION	Extremely Co-operative, Often Goes Out Of Way to Help	Works Very Well With Others	Works Well With Others	Tendency to Work Alone	Tries Hard But Has A Difficult Manner	Makes Little Effort To Cultivate Smooth Relations
4. PUBLIC RELATIONS	Excellent	Very Good	Good	Satisfactory	Fair	Poor
5. ABILITY TO COMMUNICATE (A) VERBALLY	Most Forceful, Really Gets His Ideas Across	Expresses Himself Very Clearly and Concisely	Quite Able at Expressing Himself	Expresses Himself Adequately	Has Some Minor Faults	Has Considerable Difficulty In Expressing Himself
(B) IN WRITING REPORTS, MEMORANDA, ETC.	Most Fluent, His Work Is a Pleasure to Process	Shows Considerable Aptitude In This Field	Shows Good Aptitude In Written Work	Generally Satisfactory	A Little Weak, Room For Improvement	Very Weak, Much Room For Improvement
6. INITIATIVE ABILITY TO THINK AND ACT WITHOUT BEING URGED	A Real Driver, Gets Right On With The Job	Noticeably Forceful In Thinking and Acting	Quite Satisfactory	Proceeds With Necessary Action Slow M...	Needs A Little Push Now and Then	Continually Needs Urging And Direction
7. DISCIPLINE (A) ACCEPTANCE OF	Excellent Response To Discipline	Noticeably Mindful of Discipline	Mindful of Discipline	Accepts Discipline As A Matter Of Course	Rather Indifferent Towards Discipline	Resentful of Being Disciplined
(B) ABILITY TO ENFORCE (SUPERVISORS)	Extremely Capable	Very Capable	Quite Capable	Fairly Capable	A Little Weak	Very Weak
	UNABLE TO ASSESS AS MEMBER HAS NOT HAD SUFFICIENT OPPORTUNITY TO DISPLAY					
8. CONDUCT AND DEPORTMENT	Exemplary, A Real Credit To Himself and The Force	Very Creditable	Good	Behaves In An Acceptable Manner	Could Be A Bit better, Needs Occasional Checking	Poor Behaviour
9. DEPENDABILITY	Extremely Dependable	Very Dependable	Dependable	Fairly Dependable, Requires Some Supervision	Requires Regular Supervision	Not Dependable
10. JUDGMENT	Superior, Exceptionally Sound	Very Good	Good	Fairly Good	Rash, Often Poor	Poor
11. CARE OF PERSONAL ISSUE AND OTHER POLICE EQUIPMENT	Very responsible, demonstrates exceptionally good care	Demonstrates Very Good Care	Demonstrates Good Care	Adequate Care	Tends to Show Carelessness, Needs Checking	Careless
12. LOYALTY	Very Dedicated to The Force		Dedicated	Satisfactory	Doubtful	

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13. LEADERSHIP (SEE INSTRUCTIONAL MANUAL)

14. FACTUAL DETAILS LIST ANY CHANGES SINCE LAST ANNIVERSARY IN THE FOLLOWING: (A) MARITAL STATUS; (B) CHILDREN; (C) EDUCATION; (D) SPECIAL QUALIFICATIONS; (E) JOB INTERESTS; (F) SPECIAL SKILLS AND ABILITIES.

15. NARRATIVE ASSESSMENT BY RATER

DATE _____ SIG., NAME, RANK & POSITION _____

16. REMARKS OF N.C.O. I/C BRANCH, SECTION, ETC. (UNLESS N.C.O. COMPLETED PART 15)

DATE _____ SIG., NAME, RANK & POSITION _____

17. REMARKS OF THE INTERVIEWING OFFICER - ON REVIEW

ON THE _____ I INTERVIEWED THIS MEMBER AND
DATE

(A) ☐ DISCUSSED HIS CURRENT DUTIES AND RESPONSIBILITIES WITH HIM;
(B) ☐ ADVISED HIM IN GENERAL TERMS OF HIS RATING ON THIS FORM;
(C) ☐ ADVISED HIM SPECIFICALLY OF RATINGS GIVEN UNDER COLUMNS 5 AND 6 OVERLEAF;
(D) ☐ ADVISED HIM OF ANY UNFAVOURABLE COMMENTS MADE IN PART 15 OF THIS FORM.

DATE _____ SIG., NAME, RANK & POSITION _____

18. REMARKS OF OFFICER I/C DIVISION (UNLESS THIS OFFICER COMPLETED PART 17)
(SIGNATURE WITHOUT COMMENT INDICATES CONCURRENCE)

DATE _____ SIG., NAME, RANK & POSITION _____

Comments of Personnel Officer _____

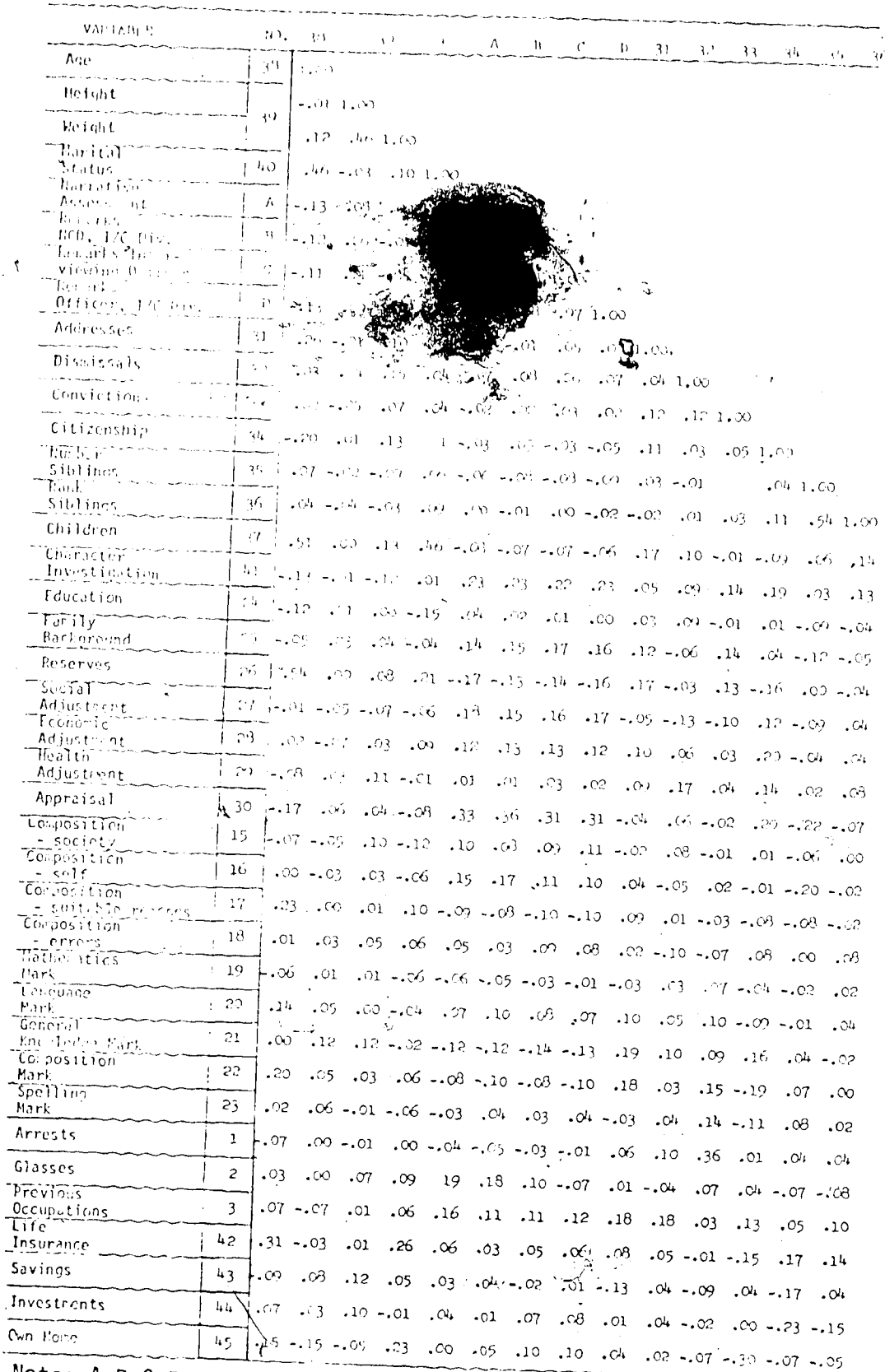
Comments of Supt. of Admin. _____

Comments of Chief Constable _____

APPENDIX I

Correlation Matrix of Predictor and Criterion Variables

CORRELATIONS BETWEEN ITEMS OF EDUCATION AND OCCUPATION VARIABLES



VARIABLE	NO.	1	2	3	4	A	B	C	D	31	32	33	34	35	36
Age	39	1.00													
Height	40	-.01	1.00												
Weight		.12	.46	1.00											
Marital Status	40	.46	-.03	.10	1.00										
Narrative Assessment	A	-.13	-.03												
Records															
BCD, I/C Disc.	B	-.13													
Length of Service Overseas	C	-.11													
Report															
Officers, I/C Disc.	D	-.15								.07	1.00				
Addresses	31	.20	-.01						.01	.05	.07	1.00			
Dismissals	32	.08	-.1						.03	.04	.07	.04	1.00		
Convictions	33			.07	.04	-.02			.03	.02	.12	.12	1.00		
Citizenship	34	-.20	.01	.13		-.03		-.03	-.05	.11	.03	.05	1.00		
Number of Siblings	35	.07	-.02	-.07		-.07	-.03	-.03	-.02	.03	-.01		.04	1.00	
Rank of Siblings	36	.04	-.04	-.03	.02	.00	-.01	.00	-.02	-.02	.01	.03	.11	.54	1.00
Children	37	.51	.00	.13	.46	-.01	-.07	-.07	-.06	.17	.10	-.01	-.09	.06	.14
Character Investigation	41	-.14	-.1	-.12	.01	.23	.03	.22	.23	.05	.09	.14	.19	.03	.13
Education	24	-.12	.01	.03	-.15	.04	.02	.01	.00	.03	.01	-.01	.01	-.00	-.04
Family Background	25	-.05	.03	.04	-.04	.14	.15	.17	.16	.12	-.06	.14	.04	-.12	-.05
Reserves	26	.54	.00	.08	.21	-.17	-.13	-.14	-.16	.17	-.03	.13	-.16	.00	-.04
Social Adjustment	27	-.01	-.05	-.07	-.06	.13	.15	.16	.17	-.05	-.13	-.10	.12	-.09	.04
Economic Adjustment	28	.02	-.07	.03	.00	.12	.13	.13	.12	.10	.06	.03	.20	-.04	.04
Health Adjustment	29	-.08	.03	.11	-.01	.01	.01	.03	.02	.07	.17	.04	.14	.02	.08
Appraisal	30	-.17	.06	.04	-.08	.33	.36	.31	.31	-.04	.06	-.02	.20	-.22	-.07
Composition - society	15	-.07	-.05	.10	-.12	.10	.03	.09	.11	-.02	.08	-.01	.01	-.06	.00
Composition - self	16	.00	-.03	.03	-.06	.15	.17	.11	.10	.04	-.05	.02	-.01	-.20	-.02
Composition - suitable persons	17	.03	.00	.01	.10	-.09	-.08	-.10	-.10	.09	.01	-.03	-.08	-.08	-.02
Composition - errors	18	.01	.03	.05	.06	.05	.03	.00	.08	.02	-.10	-.07	.08	.00	.08
Mathematics Mark	19	-.06	.01	.01	-.06	-.06	-.05	-.03	-.01	-.03	.03	.07	-.04	-.02	.02
Language Mark	20	.14	.05	.00	-.04	.07	.10	.08	.07	.10	.05	.10	-.09	-.01	.04
General Knowledge Mark	21	.00	.12	.12	-.02	-.12	-.12	-.14	-.13	.19	.10	.09	.16	.04	-.02
Composition Mark	22	.20	.05	.03	.06	-.08	-.10	-.08	-.10	.18	.03	.15	-.19	.07	.00
Spelling Mark	23	.02	.06	-.01	-.06	-.03	.04	.03	.04	-.03	.04	.14	-.11	.08	.02
Arrests	1	.07	.00	-.01	.00	-.04	-.05	-.03	-.01	.06	.10	.36	.01	.04	.04
Glasses	2	.03	.00	.07	.09	.19	.18	.10	-.07	.01	-.04	.07	.04	-.07	-.08
Previous Occupations	3	.07	-.07	.01	.06	.16	.11	.11	.12	.18	.18	.03	.13	.05	.10
Life Insurance	42	.31	-.03	.01	.26	.06	.03	.05	.06	.08	.05	-.01	-.15	.17	.14
Savings	43	.09	.08	.12	.05	.03	.04	-.02	.01	-.13	.04	-.09	.04	-.17	.04
Investments	44	.07	.03	.10	-.01	.04	.01	.07	.08	.01	.04	-.02	.00	-.23	-.15
Own Home	45	.25	-.15	-.09	.23	.00	.05	.10	.10	.04	.02	-.07	-.30	-.07	-.05

Note: A,B,C,D are the 1971-72 performance criteria

CORRELATION MATRIX (CONTINUED)

VARIABLE	NO.	33	30	40	A	B	C	D	31	32	34	35	36
Charge Accounts	46	.01	-.0	-.0	.03	.07	.06	.05	.00	.07	-.04	.07	.03	-.03	.0
Total Indebtedness	4	.07	-.00	-.01	.15	.08	.11	.10	.09	.14	.12	.16	.05	.03	.07
Auto Finance	47				-.03	.00	-.02	.00							
Smoke	48				.06	.05	.07	.03							
Drink Moderately	49				-.10	-.10	-.07	-.03							
Gambling Games	50				.13	.13	.13	.11							
Read Much	51				-.17	-.13	-.13	-.14							
First Aid	5	.09		.10	-.08	-.05	-.04	-.03	.10	.02	-.03	.01	-.06	-.01	
Swim	6	.09		.09	.05	.05	.05	.03	.00	-.03	-.06	.10	-.09	-.04	
Box	7	.10		.07	.12	.10	.11	.10	.12	-.03	.04	.03	.11	.07	
Judo	8	.14		.01	-.06	-.03	-.08	-.06	.11	-.11	.07	-.11	-.02	.05	
Foreign Language	9	.03		.03	-.09	-.10	-.09	-.09	.05	.00	-.09	-.14	.05	.00	
Years Driving	52				-.12	-.11	-.10	-.14							
Mileage	53				-.06	-.02	-.01	-.03							
Motorcycle	54				.13	.10	.09	.05							
Motor Accidents	55	.06		.14	.02	.07	.05	.04	.00	.16	.03	.09	-.01	.04	
Operate Radio	56				-.12	-.14	-.11	-.15							
Operate Switchboard	56				.05	.06	.06	.07							
Exercise Authority	57				.10	.09	.02	.04							
Other Applications	11	.03		.03	-.03	-.02	-.02	.02	.06	.13	.07	.11	.00	.01	
Military Service	12	.06		.17	-.21	-.16	-.18	-.20	.23	.00	-.01	.08	.04	.00	
Police Service	13	.25		.05	-.17	-.19	-.19	-.19	.11	.04	-.06	-.10	.05	.01	
Fire arm Knowledge	53				.27	.26	.30	.32							
Type WPM	59				.06	.05	.06	.05							
Study Easily	60				-.15	-.15	-.15	-.16							
Prompted to Apply	61				.14	.11	.20	.19							
Special Interests	62				.18	.12	.17	.16							
Special Training	63				.12	.14	.12	.14							
Labor Organization	14	-.02		.00	.07	.08	.15	.14	.03	-.05	.02	.09	.00	.07	

		37	41	24	25	26	27	28	29	30	15	16	17	18	19
Children	37	1.00													
Character Investigation	41	-.03	1.00												
Education	24	-.00	-.07	1.00											
Family Background	25	-.08	.11	.01	1.00										
R	26	.32	-.14	-.22	-.01	1.00									
Social Adjustment	27	-.04	.24	-.06	.24	-.13	1.00								
Economic Adjustment	28	.00	.28	.02	.17	-.05	.23	1.00							
Health Adjustment	29	-.01	.04	.20	.07	-.03	-.08	.15	1.00						
Appraisal	30	-.10	.21	.10	.19	-.23	.37	.21	.16	1.00					

CORRELATION MATRIX CONTINUED

VARIABLE	NO.	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Composition - society	15	-.09	.13	.15	-.07	-.13	.03	.13	-.02	.12	1.00				
Composition - self	16	-.07	.11	.19	.21	-.06	.34	.15	.00	.16	.35	1.00			
Composition - suitable persons	17	.11	.06	.11	-.02	.14	.04	.11	.04	-.01	.07	.03	1.00		
Composition - errors	18	.07	.07	.16	.02	-.03	.[illegible]	.04	-.07	.09	.04	-.09	-.08	1.00	
Mathematics Mark	19	-.01	-.03	.18	-.05	-.15	-.03	-.07	.05	-.06	.03	-.01	-.05	-.11	1.00
Language Mark	20	.09	.06	.15	-.01	.17	-.06	-.03	.00	-.19	.07	.08	.10	-.06	.09
General Knowledge Mark	21	.03	.07	-.03	-.05	.08	.07	.11	.05	.02	-.04	-.03	-.03	.02	.15
Composition Mark	22	.04	-.02	.10	-.03	.19	-.18	0.14	.02	-.26	.09	.19	.29	.23	.04
Spelling Mark	23	.01	.06	.10	.07	.01	-.08	-.04	.02	-.12	.01	.12	.12	-.20	.07
Arrests	1	-.05	.00	-.06	.05	-.03	-.08	-.00	.04	.00	-.07	-.05	-.11	-.05	.07
Glasses	2	-.03	-.00	.12	.07	-.04	-.01	.07	.08	.08	.12	.03	.11	-.08	.07
Previous Occupations	3	.04	.13	.18	.10	-.15	.13	.11	.12	.14	.13	.13	-.10	.01	.01
Life Insurance	42	.31	.06	-.31	.00	.13	.17	.02	.15	.07	-.24	-.13	-.15	.11	-.10
Savings	43	.03	-.00	.07	-.02	-.08	-.01	-.08	-.01	.05	.14	.04	-.03	.13	.13
Investments	44	-.13	-.07	.03	.03	.08	.09	.12	-.13	-.01	-.03	.10	.07	-.08	.07
Own Home	45	.03	-.08	-.13	-.01	-.03	-.02	-.09	-.05	.00	.05	.01	-.[illegible]	.04	.00
Charge Accounts	46	.14	.05	-.00	.10	.22	.03	.33	.01	.12	.08	.10	.12	.01	-.16
Total Indebtedness	4	.15	.09	-.08	.09	.05	.02	.27	.06	.03	.05	.01	.01	.11	.02
Auto Finance	47														
Smoke	48														
Drink Moderately	49														
Gambling Games	50														
Read Much	51														
First Aid	5	.12													
Swim	6	-.01													
Box	7	-.01													
Judo	8	.06													
Foreign Language	9	-.03													
Years Driving	52														
Mileage	53														
Motorcycle	54														
Motor Accidents	10	.07													
Operate Radio	55														
Operate Switchboard	56														
Exercise Authority	57														
Other Applications	11	-.03													
Military Service	12	.08													
Police Service	13	.08													
Fire arm Knowledge	58														
Type UPM	59														

CORRELATION MATRIX (CONTINUED)

VARIABLE	NO.	20	21	22	23	1	2	3	42	43	44	45	46	4	47
Mathematics Mark	19														
Language Mark	20	1.00													
General Knowledge Mark	21	.17	1.00												
Composition Mark	22	.07	.12	1.00											
Spelling Mark	23	.31	.[illegible]	.33	1.00										
Arrests	1	.[illegible]	.1[illegible]	-.03	.06	1.00									
Glasses	2	.[illegible]	.07	.10	.08	.07	1.00								
Previous Occupation	3	.01	.01	-.05	.00	.11	.02	1.00							
Life Insurance	42	.03	.01	-.05	-.02	.11	.03	.15	1.00						
Savings	43	-.14	.13	-.07	.03	-.07	.06	-.01	-.04	1.00					
Investments	44	.01	.12	-.13	-.14	-.01	-.04	-.05	.11	.11	1.00				
Own Home	45	-.[illegible]	.06	-.07	-.03	-.03	-.02	-.05	.22	.07	-.02	1.00			
Charge Accounts	46	.01	-.[illegible]	.03	.13	.27	.06	.19	.13	-.07	-.08	.21	1.00		
Total Investments	4	.01	.11	-.05	.03	.06	.02	.15	.02	.07	-.15	.35	1.00		
Auto Finance	47	[illegible]										.34	.31	1.00	
Smoke	48											.08	.05	.01	
Drink Moderately	49											.23	.13	.24	
Gambling Games	50											-.05	-.05	.03	
Read Much	51											-.02	-.02	.04	
First Aid	5	.02	.01	.07								.19	.04	.11	
Swim	6	-.04	.01	-.02								.07	.01	-.05	
Box	7	.05	-.01	.24								.05	.01	.05	
Judo	8	-.09	.00	-.10								-.13	.06	.08	
Foreign Language	9	.00	-.08	.06								-.06	-.04	-.20	
Years Driving	52											.40	.23	.31	
Mileage	53											.20	.09	.27	
Motorcycle	54											-.18	-.05	-.04	
Motor Accidents	55	.27	.09	.03								.15	.18	.20	
Operate Radio	56											.08	.05	.09	
Operate Switchboard	57											.11	-.02	.10	
Exercise Authority	58											-.14	-.10	-.13	
Other Applications	11	.11	-.03	.02								.27	-.02	-.14	
Military Service	12	.09	-.16	-.15								.13	.07	.05	
Police Service	13	-.15	-.08	.11								-.05	-.06	.19	
Fire arm Knowledge	59											-.01	-.05	-.08	
Type Work	60											.11	-.09	.07	
Study Family	61											.06	.13	.02	
Prompted to Study	62											.11	-.04	-.04	
Special Interests	63											-.10	-.01	-.17	
Special Training	14											-.03	-.04	-.08	
Labor Organization	15	.07	.06	.05								.14	.14	.09	

CORRELATION MATRIX (CONTINUED)

VARIABLE	NO.	48	49	50	51	5	6	7	8	9	60
Auto Finance	47										
Smoke	48	1.00									
Drink Moderately	49	.16	1.00								
Gasoline Gauge	50	.08	.03	1.00							
Read Much	51	.07	.11	.17	1.00						
First Aid	5	.06	.03	.01	.10	1.00					
Swim	6	.03	-.19	.11	.09	.05	1.00				
Box	7	.10	.10	.02	.11	.18	.10	1.00			
Judo	8	-.00	.03	.18	.04	.06	.11	.05	1.00		
Foreign Language	9	.08	-.13	-.12	.01	-.03	-.13	.07	.03	1.00	
Years Driving	60	.07	.33	-.23	-.10	.14	-.04	.18	.09	.12	1.00
Mileage	61	.05	.03	.13	.16	.01	.10	.13	.12	.18	
Motorcycle	62	-.06	-.13	-.08	-.13	-.17	.10	.03	.08	.20	
Motor Accidents	63	.01	-.05	-.11	.00	.01	.00	-.00	-.08	-.03	
Operate Patio	64	.00	.16	.04	.10	.02	.19	.16	.17		
Operate Switchboard	65	-.14	.10	.05	.01	.12	.11	.18	.13	.0	
Exercise Authority	66	.03	-.18	-.12	-.01	-.33	.04	-.26	-.23	-.	
Other Applications	67	.05	.10	.06	.16	.03	.02	.03	.00	.0	
Military Service	68	.05	.17	.14	.17	.05	.03	.10	.04	.14	
Foli Service	69	.07	.11	-.01	.30	.00	.04	-.01	.35	-.03	
Fire arm Knowledge	70	.01	-.15	-.16	-.30	-.47	.01	-.27	-.35	-.10	
Type WPM	71	-.11	-.06	.03	.02	-.03	.09	.08	.07	.04	
Study easily	72	.17	.08	-.16	-.04	-.01	.05	-.06	-.16	-.18	
Prompted to Apply	73	.20	-.06	-.00	-.13	-.10	.12	.06	-.15	-.09	
Special Interests	74	.02	-.11	-.08	-.06	-.11	-.01	-.03	-.25	-.15	
Special Training	75	.05	-.09	-.08	-.13	-.38	.03	-.08	-.38	-.06	
Labor Organization	76	.16	.16	.09	.00	.01	-.05	-.01	-.02	-.12	

CORRELATION MATRIX (CONTINUED)

VARIABLE	NO.	46	49	50	51	5	6	47	8	9	10
Auto Finance	47										
Scuba	48	1.00									
Digital											
Moderately	49	.10	1.00								
Gambling											
Guns	50	.08	.23	1.00							
Read Much	51	.07	.11	.17	1.00						
First Aid	5	.06	.03	-.1	.12	1.00					
Swim	6	.03	-.14	.11	.02	.05	1.00				
Fox	7	.10	.10	.02	.11	.13	.10	1.00			
Judo	8	-.02	.03	.18	.04	.06	.11	.05	1.00		
Furrier											
Ferrets	9	.08	-.13	-.12	.01	-.03	-.13	.02	.03	1.00	
Years Driving	10	.02	.33	-.02	-.10	.14	-.04	.14	.00	.12	1.00
Mileage	11	.05	.02	.13	.16	.03	.10	.10	.12	.18	
Motorcycle	12	-.06	-.13	-.04	-.13	-.17	.16	.00	.08	.20	
Motor Accidents	13	.01	-.05	-.11	.00	.01	.00	-.00	-		
Operate Radio	15	.00	.16	.04	.15	.02	.19	.16	.1	.05	
Operate Switchboard	16	-.14	.10	.05	.01	.12	.11	.18	.1	.05	
Exercise Authority	17	.03	-.13	-.12	-.01	-.13	.04	-.06	-.1	.05	
Other Applications	1	.05	.10	.05	.16	.03	.02	.03	.00	-	
Military Service	19	.00	.17	.14	.17	.05	.03	.10	.04	.14	
Police Service	20	.07	.11	-.01	.10	.00	.04	-.01	.35	-.03	
Fire											
Knots	21	.01	-.15	-.18	-.30	-.47	.01	-.27	-.35	-.10	
Type Well	22	-.11	-.06	.03	.03	-.03	.09	.08	.07	.04	
Study Easily	23	.17	.08	-.1	.04	-.01	.05	-.06	-.18	-.18	
Promised to Apply	24	.00	-.07	-.02	-.13	-.10	.12	.06	-.15	-.00	
Special Interests	25	.02	-.11	-.08	-.06	-.11	-.01	-.03	-.05	-.15	
Special Training	26	.05	-.00	-.08	-.13	-.38	.03	-.09	-.38	-.06	
Labor Organization	27	.16	.16	.09	.00	.01	-.05	-.01	-.00	-.12	

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