

**POLICE RECRUIT SELECTION -  
PREDICTORS OF ACADEMY PERFORMANCE**

June 1996

Research and Co-ordination Division

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Linda Waugh was responsible for researching and writing the paper.

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## EXECUTIVE SUMMARY

This paper assesses the validity and utility of current recruit selection criteria in predicting performance at the Queensland Police Academy. Academy performance was used as the measure of selection criteria effectiveness, since no standardised work performance evaluation data are available.

Key findings of the analysis were:

- Psychometric test results and education/employment ratings are the best predictors of performance at the Academy
- Panel interview ratings contributed very little to predicting Academy performance
- Psychometric test results and education are not correlated, indicating that they are independent measures of performance.
- Some of the psychometric tests which formed the composite score for each applicant had poor predictive value for Academy performance.
- The 16PF (personality test) did not assist in screening applicants in or out of the selection process. No consistent test profile could be found for poor performers at the Academy.

The paper concludes that the current selection criteria and selection process used by the QPS should be reviewed. Particular attention needs to be directed towards the interview process and the use of personality tests. Furthermore, there should be a revision of the weighting of the criteria (currently 33% each) in the final composite score for each applicant. In revising the current selection criteria, consideration should also be given to the sequence of "hurdles" used in the selection process. The most cost-efficient assessments with good predictive power should be used as early in the screening process as possible and the more expensive assessments in the final stages of selection.



## INTRODUCTION

Following the release of the report of the Fitzgerald Inquiry, the Queensland Police Service (QPS) implemented several significant changes in recruit selection procedures. A key objective of these changes was to raise the quality of recruit intakes and thereby improve the standard of service provided by the QPS to the people of Queensland.

This research paper assesses how well the various selection criteria currently used by the QPS predict recruit performance at the Queensland Police Academy. A previous study of the 1991 recruit intake (Burke 1993) found that psychometric tests, education and age were the best predictors of performance in the recruit training program. However, since this report was released, there have been several modifications made to the selection process (for example, changes in education standard pre-requisites, physical skills test and in the content of the panel interview). In addition, substantial changes have been implemented in the area of recruit training, with the introduction of the Police Recruit Operational Vocational Education (PROVE) program in January 1994. Hence, it cannot be assumed that the conclusions of this earlier study still apply.

The release of this research paper is the first step in what the Criminal Justice Commission (CJC) understands will be a comprehensive review of current selection procedures and criteria, to be conducted under the auspices of the Police Education Advisory Council (PEAC) during 1996/97. The proposed review is particularly timely given the increased pressure which is likely to be placed on the recruit selection process as a result of the Queensland Government's commitment to substantially increase the size of annual recruit intakes.

The paper has been prepared pursuant to section 56(3)(f)(iv) of the *Criminal Justice Act 1989*, which states that one of the functions of the CJC's Research and Co-ordination Division is to:

review on a continuing basis the effectiveness of programs and methods of the police department, in particular in relation to -

...

matters affecting the selection, recruitment, training and career progression of members of the police service and their supporting staff.

## SCOPE AND LIMITATIONS OF THE STUDY

This study has several limitations which require the results to be interpreted with caution. In particular:

- It cannot be assumed that good performance at the Academy is a strong predictor of subsequent work performance. However, it was necessary to focus on the Academy stage since no standardised work performance evaluation data were available.
- The sample used for analysis consisted entirely of applicants who had been successful in being selected for the Queensland Police Academy. Hence, there was relatively little variability in the subject population.
- Only limited information was available for some variables. For instance, no data were available on recruits' level of educational achievement within degree and diploma courses.

## THE SELECTION PROCESS: AN OVERVIEW

The QPS uses several selection criteria to select candidates from a relatively large application pool. There are a series of “hurdles” that applicants from this pool must pass (QPS 1996). At each hurdle some applicants will be “knocked out”; this process continues until the number of remaining applicants is close to the number of positions available at the Academy. Figure 1 (below) outlines the current sequence of hurdles.

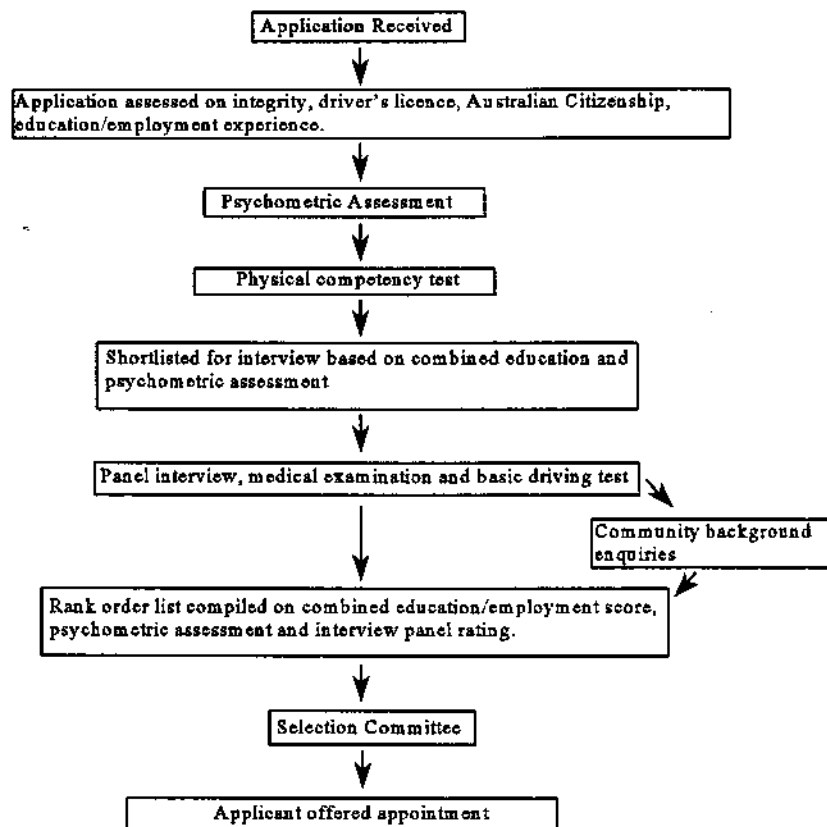


FIGURE 1 – THE SELECTION PROCESS

Source: QPS 1996.

Applicants are initially assessed on integrity, driver's licence, Australian Citizenship and education/employment. The score given to each applicant for educational qualifications also encompasses work experience. Education and number of years of work experience and, in some cases, the type of work experience are combined to give a single score. In some cases, applicants who do not meet education criteria may be accepted on the basis of relevant work experience alone.

The next hurdle is psychometric assessment. The battery consists of eight tests which cover non-verbal and verbal reasoning, memory and clerical skills, spatial, numerical and mechanical abilities. The general purpose of these tests is to measure intelligence, independent of cultural biases and education. Aspects of personality are measured by the 16PF personality test.



After completing the physical competency test, applicants are short listed and interviewed. The three member interview panel is comprised of two members of the QPS and a representative of the community, independent of the QPS. The interview is structured so that all applicants are asked the same questions and are rated on the same five criteria. Each criterion is weighted according to its overall importance in contributing to the final panel interview score. The criteria and their allocated weights are listed below in the section on data sources.

Interviewers may ask additional questions to those which have been pre-determined. This usually occurs if the selection panel wants to explore issues raised by an applicant's responses. The applicant is rated on a scale of one to 10 on each of the five criteria, to reflect the extent to which the applicant satisfied the criteria. The weight by rating scores on each criterion are then added to give an overall score for the panel interview.

In the final phase of selection, the applicants are given a single score which is comprised of the composite psychometric test result, the rating of education/employment history, and the score from the structured panel interview. Each of the three components have equal weight (33.33%). This score is coupled with the final consideration of the selection committee.

### ***STRUCTURE OF THE ACADEMY PROGRAM***

The Police Recruit Operational Vocational Education (PROVE) program was introduced in January 1994. This program takes six months to complete and is based on the Police Service Recruit Education Program (PREP) used in New South Wales. PROVE is 130 days of instruction in length with training at the Academy and two weeks observing patrols in Brisbane. A Problem Based Learning (PBL) educational methodology is used which aims to promote a "thinking" approach to policing. The program aims to bring recruits to a level of competence where they can satisfactorily carry out the duties of a First Year Constable working under supervision.

The program is structured into seven modules:

- Module 1 – Foundation studies
- Module 2 – Station Duty
- Module 3 – Traffic
- Module 4 – Offences against property
- Module 5 – Offences against the person
- Module 6 – Community Safety
- Module 7 – Public Order

and four operational skills areas:

- Firearms and Officer Survival Training
- Physical Skills and Health Education
- Computer Education
- Driver Training

Recruit performance on Modules 1, 2, 4, 5, 6, and 7 is rated from pass (4) to high distinction (7).

For Module 3 and the four operational skills areas, recruits are graded on a pass or fail basis. Those recruits who fail in an area continue with training until competency (a pass) is achieved.

## METHODOLOGY

### DATA

The analysis was restricted to those officers who had trained at the Academy since the introduction of the PROVE program in January 1994. This was to prevent any confounding effects due to changes in selection criteria and training structure which were most significant before the introduction of PROVE. Data for all five recruit intakes from January 1994 to May 1995 were provided by the Recruitment Division of the QPS and the Police Academy.

The following summarises the data provided:

<i>Demographics</i>	Age and gender.
<i>Psychometric Test Battery</i>	<p>A composite score<sup>1</sup> from:</p> <ul style="list-style-type: none"> <li>• Wechsler Adult Intelligence Scale – Revised (WAIS-R): digit symbol (Dsy) and digit span (Dsp).</li> <li>• Standard Progressive Matrices (SPM).</li> <li>• Differential Aptitude Tests (DAT): mechanical reasoning (MR), space relations (SR), and numerical ability (NA).</li> <li>• Watson-Glaser Critical Thinking Appraisal (CTA).</li> </ul>
<i>Personality Test</i>	Sixteen Personality Factor Questionnaire (16PF).
<i>Education/ Employment</i>	An allocated score depending on combined education and employment, or relevant employment (see Appendix A).
<i>Panel Interview</i>	<p>A score obtained from a highly structured and weighted interview with a panel of three. Weights and criteria are:</p> <ul style="list-style-type: none"> <li>• Police Orientation (10) (motivation, job knowledge, knowledge of PROVE, preparedness for police duties)</li> <li>• Personal Suitability (9) (decision making ability, judgement, ability to cope under pressure)</li> <li>• Social Maturity (9) (leadership qualities, teamwork, empathy, responsibility and reliability, social tolerance)</li> <li>• Interpersonal Communication Skills (8) (fluency, clarity, and listening skills)</li> <li>• Personal Impact (7) (dress and grooming, confidence, presence/impact)</li> </ul>

1 Formula for composite score:  $\{SPM + CTA + (MR+SR)/2* \text{ (if } MR-SR < 10) + (DSY + DSP)/2* \text{ (if } DSY < DSP)\}/4**$  (Burke 1993).

*Academy Performance* A grade point average (GPA) score was calculated for each recruit by averaging performance across the six academic modules. These modules were each graded on a pass (4) to high distinction (7) basis.

Data were also provided by the Academy for the operational skills training areas and Module 3. However recruits were graded on a pass or fail basis only, rendering the data unsuitable for inclusion in the analyses.

**CHARACTERISTICS OF RECRUITS**

A total of 437 recruit records were made available for analysis. Sixty-eight per cent of the recruits were male and 32 per cent were female. The mean age for males was 26 years and for females 24 years. Figure 2 shows the distribution of age and gender data.

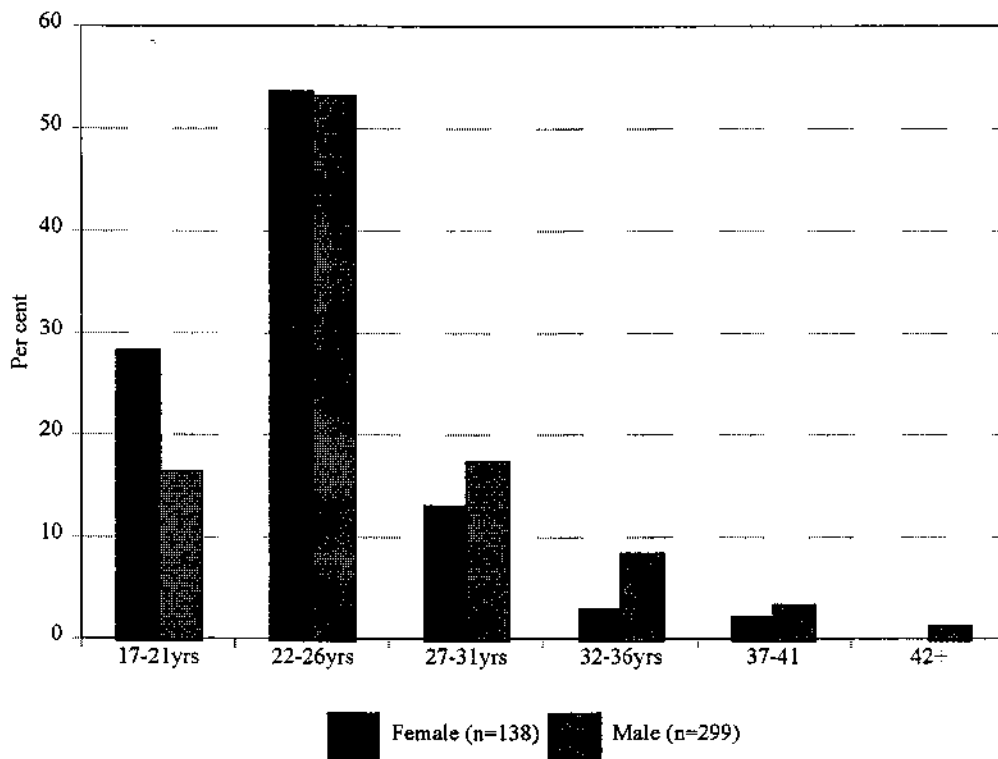


FIGURE 2 – PERCENTAGE OF MALES AND FEMALES IN EACH AGE CATEGORY

**METHOD OF ANALYSIS**

A standard multiple regression was performed with Academy performance as the dependent variable (DV)<sup>2</sup>, and the composite psychometric scores, education/employment scores and panel interview scores as independent variables (IV)<sup>2</sup>. Multiple regression is the most appropriate analysis as it enables the relationship between variables to be examined when some of the variables are correlated. This technique can determine the extent to which a number of variables contribute to a single global measure. This is a

2 The term “dependent variable” refers to what the researcher is trying to explain or predict (in this case Academy performance). Independent variables are either predictor or causal variables.

similar methodology to that used in a previous study (Burke 1993) which examined the predictive power of education, psychometric assessments and panel interview scores for Academy performance for the QPS.

Before analysis commenced, the data base was screened for errors, missing values, and normality of distributions. No serious problems were found with the data. Means and standard deviations of the variables are shown in Table 1.

**TABLE 1 – MEANS AND STANDARD DEVIATIONS FOR THE VARIABLES**

	Module GPA (DV)	Composite Psychometric	Panel Interview	Employment Education
Mean	5.07	55.53	57.68	60.54
Standard Deviation	0.62	4.39	4.76	3.15

Note: n=437.

### RESULTS OF THE ANALYSIS

The regression analysis showed that composite psychometric scores, panel interviews and employment/education together explained 16 per cent of the variance (significant at the 0.001 level). That is, these three variables explained 16 per cent of the variation in performance at the Academy. The composite psychometric score and employment/education contributed most to explained variance, as can be seen from an examination of the Beta weights<sup>3</sup> in Table 2.

**TABLE 2 – BETA WEIGHTS AND CORRELATIONS<sup>4</sup> BETWEEN VARIABLES**

Variables	Correlation with Module GPA (DV)	Correlation with Composite Psychometric	Correlation with Employment/ Education	Correlation with Panel Interview	Beta Weights
Composite Psychometric	0.31				0.31**
Employment/ Education	0.25	0.01			0.24**
Panel Interview	-0.04	-0.11	-0.14		0.03

Notes:

1. n=437
2. \*\* significant at the 0.001 level.

3 Beta weights indicate the relative importance of each variable in explaining the variance and are standardised so that differences in standards of measurement between variables are removed. Beta weights are therefore able to be directly compared to each other.

4 Correlation is a measure of the degree of association between two variables. Because data in its calculation are standardised it may be interpreted as follows; a maximum value of 1.00 means a perfect positive correlation; a value of -1.00 means a perfect negative correlation; and a value of 0.00 means no linear relation.

There was no correlation between the employment/education measure and the composite psychometric scores (correlation=0.01). However, both contributed significantly to explained variance. This finding indicates that performance on the measures of intelligence in the psychometric tests was relatively independent of skills measured through the combined education/employment rating.

The resulting standardised regression equation for predicting Academy performance, as based on the general linear equation, is as follows:

$$(\text{AcadPerf GPA}) = 0.24(\text{Educ/Employ}) + 0.31(\text{comppsy}) + 0.03 (\text{PanInt})$$

**CONTRIBUTION OF PSYCHOMETRIC TESTS**

To assess which psychometric tests were more useful, a further regression analysis was conducted using Academy performance as the dependent variable and education/employment scores, panel interview scores and scores on each of the seven psychometric tests as independent variables. Means and standard deviations for each of the seven tests are presented in Table 3.

**TABLE 3 – MEANS AND STANDARD DEVIATIONS FOR EACH PSYCHOMETRIC TEST**

	WAIS-R Digit Symbol (DSy)	WAIS-R Digit Span (DSp)	Standard Progressive Matrices (SPM)	DAT Mechanical Reasoning (MR)	DAT Space Relations (SR)	DAT Numerical Ability (NA)	Watson- Glaser Critical Thinking Appraisal (CTA)
<b>Mean</b>	56.11	54.54	57.72	53.35	54.63	55.10	54.58
<b>Standard Deviation</b>	9.18	9.79	8.34	7.90	8.83	8.68	8.92

Note: n=437.

The regression analysis showed that the nine variables together explained 21 per cent of the variance (significant at the 0.001 level). Education/employment, standard progressive matrices, digit symbol, digit span, and the Watson-Glaser critical thinking appraisal contributed most to explained variance (see Table 4).

TABLE 4 – BETA WEIGHTS AND CORRELATIONS BETWEEN VARIABLES

Variables	Module GPA (DV)	Employ Educ	Panel Inter	WAIS-R DSy	WAIS-R DSp	SPM	DAT MR	DAT SR	DAT NA	Beta Weights
Employ/Educ	0.25									0.22**
Panel Inter.	-0.04	-0.14								0.02
WAIS-R Dsy	0.31	0.04	0.12							0.21*
WAIS-R Dsp	0.21	-0.03	0.09	0.19						0.11*
RPM	0.27	0.01	-0.06	0.13	0.05					0.18*
DAT MR	0.07	-0.07	0.38	-0.06	0.03	0.41				-0.07
DAT SR	0.09	-0.07	0.48	0.12	0.10	0.53	0.50			-0.09
DAT NA	0.24	0.05	0.53	0.16	0.21	0.51	0.42	0.41		0.05
W-G CTA	0.30	0.07	0.30	0.11	0.14	0.29	0.28	0.21	0.37	0.19**

Notes:

1. n=437.
2. \*significant at the 0.05 level; \*\* significant at the 0.001 level.

The increase in explained variance may be an artefact of increasing the number of variables in the equation, or may have resulted because predictive value is decreased in the calculation of the composite psychometric score (see formula in footnote 1). As can be seen in Table 4, mechanical reasoning, spatial relations and numerical ability tests show poor predictive power for Academy performance. A series of individual regressions failed to show any of the three tests to have significant predictive value even when considering performance on each module individually.

An attempt was also made to assess the predictive power of the 16PF. However, it is difficult to run group analyses on a test where each profile needs individual interpretation. Poor performers (i.e. those who had been suspended or terminated) were examined, but there was no consistent profile in terms of the 16PF.

### *CONTRIBUTION OF EDUCATION/EMPLOYMENT*

To provide further information about the education/employment variable two more analyses were conducted. The employment/education groups were coded as follows:

- completed a Degree or Diploma (Group 1)
- completed three semesters in Justice Studies or Justice Administration or completed an Associate Diploma (Group 2)
- completed trade or hospital based nursing training after successful completion of year 12 studies (Group 3)

- achievement of equivalent rank of sergeant in the Defence Forces or previous service with police force (Group 4)
- five years employment in a senior or para-professional position (Group 5)
- general employment of at least five years full time with year 12 studies or four subjects at Associate Diploma or Degree level (Group 6)
- persons who are waived the education/employment criterion for entry (Group 7).

A one way analysis of variance (ANOVA) was run to examine differences between groups. It was found that employment/education groups differed significantly in terms of Academy performance. Post hoc analyses (Bonferroni test) showed that those recruits who had completed a degree or diploma had significantly (at the 0.05 level) better Academy results than those who had the employment/education criteria waived; had completed a trade or hospital based nursing training; or, had general employment of at least five years full time with Year 12 studies or a partial associate diploma or degree.

### *CONTRIBUTION OF PANEL INTERVIEW SCORES*

Panel interview scores did not correlate with any of the other variables in the analysis; that is, performance at the Academy, composite psychometric scores, or employment/education scores. The implication of this finding is discussed below.

### *AGE*

Given the strong predictive power of age in Burke's (1993) analysis of the 1991 intake, this variable was also considered in the current analysis. However, age failed to show any predictive power. The most likely explanation of this finding is that the current pre-requisites for education and previous work experience produce an older pool of recruits which removes the "age effect": for example, only 15 per cent of recruits in the May 1995 intake were aged under 21 years compared with over 50 per cent in 1991.

## CONCLUSIONS

### *KEY FINDINGS*

The analysis showed that the single best predictor of Academy performance was the composite psychometric test result. Employment/education was also a significant predictor. Overall, panel interview scores contributed little to explaining Academy performance.

Further analysis showed significant differences between the individual psychometric tests in predicting Academy performance. Good performance on standard progressive matrices, digit symbol, digit span, and the Watson-Glaser critical thinking appraisal tests contributed significantly to Academy performance. However, performance on mechanical reasoning, spatial relations, and numerical ability tests showed little predictive power.

Burke (1993) similarly found that psychometric tests (Digit Symbol, Standard Progressive Matrices, and Critical Thinking Appraisal) and education were the best predictors of performance at the recruit training program.

Given the nature of the 16PF, group analyses were not run on the data for this test. However, an examination of individual test results for recruits who had been suspended or terminated showed no consistent profiles.

Analysis of the education/employment variable showed that people who had completed a degree or diploma obtained significantly better Academy results than those who had:

- employment/education criteria waived
- completed a trade or hospital based nursing training
- general employment of at least five years full time with year 12 studies or a partial associate diploma or degree.

The poor findings for panel interviews indicate that:

- the information being obtained from the interviewee and/or the rating/ranking of interview information does not discriminate between good and poor performers at the Academy
- the interview needs more structure or standardisation.

The scores for interviews show a slight middle rating tendency. However, the lack of predictive power for interviews cannot be attributed to this factor.



## LIMITATIONS

The findings of this report are not conclusive and the results should be considered in light of the following limitations:

- The measure used to assess the validity of the current selection criteria was performance at the Academy, whereas the ideal dependent variable would be work performance evaluations. *As emphasised, it cannot be assumed that good performance at the Academy will equate with subsequent good work performance.*
- The spread of scores (variance) in the data is minimal since only the top of the applicant pool actually get into the Academy. Therefore, the difference between the best and worst Academy performers was relatively small. It could be argued that with a comparatively high selection threshold, even the worst performer may be suitable for training.
- Performance on six modules (rated 4 to 7) was averaged to provide a grade point average for each subject which provided a global measure of Academy performance. The use of a global measure does not allow for the investigation of the relative importance of each selection criterion for performance on each module when considered individually.
- The employment and education data supplied by the QPS were combined (i.e. each person received a single score) so it was not possible to assess the predictive power of education and employment separately.

## CONSIDERATIONS FOR REVIEW

Notwithstanding the limitations described above, the results of this study have highlighted the need for a revision of the current selection criteria and the selection process used in the QPS. Recruitment is a very important area for any organisation, and considerable attention and detail should be given to the method by which people are selected to participate in the organisation.

Any review should consider the following issues:

- The differences in predictive power of each of the selection criteria suggests that there should be a revision of the weighting of these criteria (currently 33% each) in the final composite score for each applicant. Weights should reflect the relative importance of each criteria in selecting the "best applicant" for the position.
- The differences in predictive power of psychometric tests indicate that they could be reviewed. Given the cost and time of administering and scoring these tests, it may be better to use only those tests which are good predictors of Academy performance.
- The 16PF is arguably not suitable for use in the selection process. It is important to note that the 16PF is subject to interpretation; staff need to be specifically trained in the interpretation of test results or this should be done by a consultant psychologist who specialises in this area. Personality testing is used by police services in other states and countries; in some cases it is to screen in applicants with "good" profiles rather than screen out "bad apples". If personality testing is to be used in selection there needs to be further investigation of the type of test to be used, how the results will be interpreted and the data utilized. The New Zealand Police Service is currently examining the utility of the NEO Personality Inventory in selection, which has shown good predictive validity for future job performance (Black 1995).

- An analysis of the education/employment variable showed that these two variables may be independently important in predicting Academy performance. Future consideration of each variable separately may enable better discrimination between good and poor performers.
- Currently all degree holders are allocated the same number of points regardless of their grade point average. Consideration could be given to how well each applicant performed in completing his or her degree. For example, more points could be given to those who passed at honours level in comparison to those who struggled to pass. Given the academic nature of the PROVE program, it would be appropriate to recognise those applicants who were able to complete their graduate degrees with ease.
- The use of interviews in the selection process needs revision and restructuring, considering the high cost of interviews and their poor predictive validity.
- This study should be replicated as intakes get larger (as expected in 1996) and possibly less stringent selection criteria are applied. This may provide greater variance in data, thereby allowing better discrimination between good and poor performers.
- In revising the current selection criteria, consideration should be given to the selection process and the sequence of "hurdles". The most cost-efficient assessments with good predictive power should be used as early in the screening process as possible and the more expensive assessments in the final stages of selection.
- Finally, the development of standardised work performance measures should be a priority of the QPS. Once these measures are in place, a more comprehensive and accurate analysis of selection criteria can be undertaken.

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## APPENDIX A

### EDUCATION/EMPLOYMENT ASSESSMENT FOR JANUARY AND MAY 1995

EDUCATION LEVEL	GENERAL EMPLOYMENT EXPERIENCE		
	A (0-3yrs)	B (> 3yrs)	C (> 5yrs)
1. Degree	93	95	97
2. Diploma	90	92	94
3. Three semesters degree or greater	89	91	93
4. Associate diploma	88	90	92
5. Trade with year 12 pass	85	87	89
6. Nursing with year 12 pass	85	87	89
7. Defence force (sergeant of equivalent rank)	85	87	89
8. Police service (years service)	85 (0-2)	87 (2-5)	89 (5+)
9. Relevant employment experience			88
10. General employment			85

## Notes:

1. Completed degree in any field undertaken in Australia or overseas. Includes degrees in Justice Studies or Justice Administration and any completed or incomplete postgraduate studies.
2. Completed diploma in any field undertaken in Australia or overseas.
3. At least three full-time semesters or equivalent of any degree course or greater level of study but incomplete, undertaken in Australia or overseas and includes studies in Justice Studies or Justice Administration.
4. Completed associate diploma in any field undertaken in Australia or overseas from a tertiary institution with at least TAFE level of education and includes the Associate Diploma of Business (Justice Administration).
5. Completed trade after successful completion of year 12 studies. General employment experience need not be in field of trade.
6. Completed hospital based nursing training after successful completion of year 12 studies. General employment experience need not be in field of nursing.
7. Defence Force service and attainment of the rank of sergeant or equivalent within the last ten years. General employment experience need not be in Defence Forces. OR six or more years service with sergeant qualifications (85 only).
8. Years of sworn police service in a constituted police service in Australia or overseas within the last ten years.
9. A minimum five years employment experience within the last ten years in one or a combination of the following occupation groups: manager, administrator, and para-professionals.
10. General employment of at least five years full time combined with Year 12 studies (pass in 5 subjects at school or 4 subjects by external study) or four subjects at associate diploma or degree level.