THE INVALIDITY OF THE HIGHER SCHOOL CERTIFICATE AS A TERTIARY SELECTION DEVICE

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INTRODUCTION

Discussions of student selection for tertiary education are often confused by the compounding of two issues — (1) whether selection should occur at all and (ii) what selection procedure should be used. This article concerns the second of these questions. Thus it assumes that selection should occur, and so appropriately it begins by summarising the reasons usually used to support this point of view. Evidence is then provided to demonstrate that, within the framework of these reasons, the use of HSC (Higher School Certificate) as a selection procedure cannot be justified.

THE CASE FOR SELECTION

Malley[1] identified two groups in the selection debate who put the case for selection. The first, which he calls the "classical" school, is concerned with the maintenance of standards of academic excellence, and so this group supports the continued use of a content-related selector. The second recognises both the "backlash" effect of a content-related selector on secondary schools and the limited opportunities that present selection procedures offer to lower socio-economic and other disadvantaged groups. Nonetheless, this group supports the notion of standards and some form of pre-entry testing, but of a content-free and social class-independent nature.

To these two groups can be added a third, that which is concerned with wastage. It argues for selection as a way of minimising failure rates. Its position is summed up in a recent newspaper editorial during the now annual public debate concerning tertiary selection

> "If there are to be no tertiary entrance requirements ... there would be massive failure rates, vast waste of taxpayers' money ..."[2]

To justify their position empirically, each of these groups needs to demonstrate a relationship between the selection device and tertiary performance. If "maintaining standards" has any meaning, those students measured to be of higher standard must perform in their tertiary examinations better than those who are measured to be of lower standard. If the tertiary selection procedure is to prevent "massive" (or even medium) failure rates, then the students who obtain high scores on the selection test should have a better pass rate than those who obtain low scores. The usual empirical procedure has been to examine the overall correlation for a sample of students for whom scores on both the selection test (or tests) and tertiary performance are available. This has been the approach in the various investigations of the Tertiary Education Entrance Project and the Australian Scholastic Aptitude Test as alternatives to the Higher School Certificate.[3].

The problem with the use of the correlation coefficient is that it describes the degree of association between the two scores across the whole range of scores sampled while the cut off occurs only in one region (the bottom ends) of that range. The inferential link between correlation coefficient and the validity of a selection test depends on the assumption that the selection test is an effective predictor in the range within which selection cut off occurs. In the results presented here, this is clearly not true.

The Validity of H.S.C. as a Selector — Some Results

In a longitudinal study of students enrolling for the first time in Engineering at Monash University in 1970, West and Slamowicz[4] (1976) examined correlates and predictors of performance in first year and subsequent years. They showed that Anderson Score* was the major correlate of performance (for first year the coefficient with Grade Point Average was found to be 0.44 for N = 170, for final year 0.39 for N = 90). They also determined the correlation coefficients for two subsamples based on a median split on Anderson Score. The results are shown in Table 1.

This indicates that in the region in which selection occurs the predictive power of Anderson Score is negligible. If this result is generalizable, it throws into question the validity of using HSC as a selector and the value of the correlation coefficient to compare various selection devices. To give further meaning to these figures, West and Slamowicz investigated the success rates if the whole cohort is compared to the group from which the bottom quarter (based on Anderson Score) had been excluded. The results are shown in Table 2.

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*A score based on the Higher School Certificate results, used in Victoria for the selection of tertiary students.

Table 1

Correlation coefficients between Anderson Score and tertiary performance for upper and lower Anderson Score categories (1970 intake, Faculty of Engineering, Monash University)

SUB SAMPLE	FIRST YEAR G.P.A.*	FINAL YEAR G.P.A.
Below the median Anderson Score	0.05	0.00
Above the median Anderson Score	0.52	0.40

*Grade point average

It can be seen that if selection had been more stringent in 1970, and one quarter of the cohort had been excluded, the improvement in success rate would have been trivial. The cost would have been to exclude 64 students, 46 of whom successfully completed first year and 30 of whom graduated.

In order to examine the generalizability of these findings the analysis described by Table 1 has been repeated for a number of specific HSC subjects and the corresponding first year subject at Monash University. Specific subjects were used because in faculties other than Engineering, the subject combinations of first year students varies considerably. Hence an overall index of first year performance is less meaningful. The results are shown in Table 3.

Once again, in the region where selection is likely to occur, the HSC subjects are generally insignificant predictors of first year tertiary performance in the corresponding subject.

The results of Table 3 can be given more meaning if comparisons of success and pass rates for various other groupings (e.g. deciles) are made. Table 4 shows such a comparison for the chemistry students of Table 3 divided into ten groups (deciles) based on scores in HSC chemistry. Chemistry was chosen because of the large number of students (879) for whom data is available.

Table 2

Tertiary success rates of students with known Anderson Scores (1970 intake, Faculty of Engineering, Monash University).

	Number Enrolling in 1970	Proceeded to second year	Graduated by 1975
1970 Cohort	250	194 (78%)	139 (59%)
1970 cohort with lowest 25% on Anderson Score removed	186	148 (80%)	109 (59%)

Table 3

Correlation coefficients between scores on HSC subject and the equivalent first year university subject (Monash University).

1971 HSC Subject	1972 Monash Subject	Correlation Coefficients			No. of Students in total sample
		Total Sample	Below the Median (of HSC subject)	Above the Median	
English Lit.	English 41101	0.32*	0.01	0.36*	284
French	French 44101	0.38	-0.01	0.41*	130
Chemistry	Chemistry 26100	0.39*	-0.01	0.44*	879
Physics	Physics 84101	0.49*	0.27*	0.37*	504
Pure Math (New Syl)	Mathematics 64150	0.13	-0.14	0.28*	349
Pure Math (Old)	Mathematics 64150	0.49*	0.20	0.39*	91

(*Indicates significant at the 0.01 level — i.e. the probability that this sample correlation coefficient would be obtained when the population correlation coefficient is equal to zero, is less than 0.01.)

Table 4

Performance and pass rates in first year chemistry (Monash 26100) for each of the HSC chemistry decile groups.

Mean HSC score	Mean 1st year university	Percent 1st year university	No. pass 1st year university	Total No.	Correlation Coefficient
48.1	57.9	78	68	87	-0.19
56.9	58.7	75	66	88	0.02
60.3	60.6	80	71	88	0.02
63.7	58.3	76	67	88	-0.02
66.6	61.0	86	76	88	0.00
69.0	64.1	86	76	88	0.18
72.3	67.7	95	84	88	0.08
75.7	72.1	98	87	88	019
79.8	73.9	98	87	88	0.24*
86.4	79.6	100	88	88	0.32**

(*Significant at 0.05 level, **significant at the 0.01 level.)

It is worth pointing out that the lowest HSC group (mean 48.1, which is equivalent to a fail in HSC chemistry) performs as well as the fourth group (mean 63.7 in HSC chemistry).

Conclusions

The important implication of these results is that HSC scores in the region of the selection cut off do not predict tertiary performance. It follows that the cost (in terms of fall in academic standard or increase in failure rate) of replacing HSC with an alternative procedure, will not be very great. In addition to allowing more rational consideration of the relevant benefits of alternative selection procedures, these results would support the use of a composite selection index, which included HSC and other selection criteria, thus incorporating different selection philosophies into the one selection procedure. Such a system is being introduced in Sweden.

> "Within categories 1 and 2 [equivalent to the normal entrant in Australia] ranking will be based partly on school grade point averages, partly on working experience... Working experience, no matter what kind it might be, will give an applicant points that are added to his/her grade-point average. If the maximum grade-point average is 5, working experience can give up to 2 additional points. But a certain number of places, about 20%, will be filled only on the basis of school grades".

In the light of the results of the present study, such an index is much more valid than the use of GPA (or HSC) alone. The student who obtains a high HSC (and is therefore in the region where HSC is a good predictor of tertiary performance) will be selected, but the student who obtains a low or medium HSC (and is therefore in the region where HSC is a poor predictor of tertiary performance) will be selected if he meets sufficient other criteria — in the Swedish case, work experience.

REFERENCES

1 **J. I. Malley,** "Is Selection the Issue?, unpublished document, Higher Education and Advisory Research Unit, Monash University, 1974, p. 2-4.

2 Editorial, *Melbourne Herald,* January 2, 1976.

3 For a review of these studies see **W. McDonell,** *Testing for Student Selection at Tertiary Level,* Melbourne: A.C.E.R., 1975.

4 **L. West** and **R. Slamowicz,** "Drop out and Performance of Engineering Students: Incidence, Correlates and Predictors," Unpublished document, Higher Education and Advisory Research Unit, Monash University, 1976.

5 **B. Ostergren,** "Swedish Higher Education to be Broadened", *Current Sweden,* No. 92, Sept. 1975, p.5.