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A-LEVEL RESULTS IN COMPREHENSIVE SCHOOLS: THE COMBSE PROJECT YEAR 1

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A-level Results in Comprehensive Schools: the COMBSE project, Year 1

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ABSTRACT *This analysis of A-level English and Mathematics results from ten comprehensive schools in the north-east represents some of the work done in the first year of a 'school effects' study entitled the COMBSE project ('Confidential, Measurement-Based, Self-Evaluation'). The project enables participating schools to compare their A-level results with those of similar schools. In an attempt to take account of differences in intakes to the schools, data were collected for a wide range of variables expected to relate to A-level grades: prior achievement, socio-economic status, class size, teacher characteristics and time variables such as time allocated and time reportedly spent on homework. However, once an index based on an average O-level grade was computed, other variables contributed little or nothing to the prediction of A-level grades.*

Some findings ran counter to the general pattern of effects in the literature. For example, a negative correlation between time spent on homework and grades achieved, and smaller classes obtaining lower residual gains than larger classes in English, though not in Mathematics. Two issues were raised: is the 30% failure rate reasonable and should A-level Mathematics be so much more difficult to pass than A-level English?

"Forty percent of the class failed A-level Mathematics. What do you think of that result?" Is there much which can be said in the absence of further information? What did the school seek to achieve with its A-level Mathematics class? Were the pupils satisfied? What kinds of pupils were enrolled in the class? Was their achievement just about what would have been expected if the pupils had been at some other school? Without answers to such questions no one can evaluate the A-level results. Yet those examination results must be published and they will portray one aspect of the school to the community.

Not only is it difficult for an outsider to evaluate the results, *the school*, itself, cannot adequately evaluate its results. In general, schools have neither the time nor the personnel to collect and analyse large amounts of data, and they often have little information about other schools against which to compare their own results. National data are of limited relevance and provide only a few summary statistics.

The question demands research, despite foreseeable problems. With only about 17% of pupils attempting A-levels correlations will suffer from restriction in range and the numbers which can be studied in any one school in any one year will be small, in some cases very small. Only quite large effects can be expected to reach conventional levels of statistical significance with such small numbers and important statements about individual schools will only be possible after several years of data have been examined, and then only if the findings from year to year show consistency.

The question, however, is too important to avoid. Given the low failure rate in UK universities, A-levels represent the major hurdle for those seeking to enter the professions. Success at A-levels generally assures the individual of three or four years of expensive public support. It may be the most decisive examination students ever take. Parents, pupils, Local Education Authorities and universities need to know whether or not the school which a pupil happens to attend for A-level work has a large effect on the grades obtained.

Schools, and classes within schools, might differ in a multitude of ways. In this initial exploratory survey a major concern was to find effective indices for some variables which are *known* to be related to achievement (prior levels of achievement and socio-economic status) and for some variables which might be *expected* to be related to achievement. Among the latter were variables related to the expenditure of *time* (cf Frederick & Walberg, 1980; Walberg & Shanahan, 1983; Bennett, 1978). The 'time variables' measured were: the time pupils reported spending on homework (an index of pupil 'effort'), the time allocated to the subject on the timetable and the time pupils spend absent from school.

Another variable which might be expected to relate to achievement was class size. Glass & Smith (1979) presented evidence that smaller classes were associated with higher levels of achievement, but a report from the Department of Education and Science (DES, 1981) demonstrated that schools with small sixth forms had been obtaining poorer results than schools with large sixth forms. Since smaller sixth forms could also be shown to have smaller class sizes, there was a strong suggestion that, contrary to Glass & Smith, in sixth forms at least, smaller classes seemed to be associated with *poorer* results. This was true of both comprehensive schools, with a typical sixth form of 51 to 100 pupils and a typical class size of 8.4, and grammar schools, with a typical sixth form within the range of 101 to 150 pupils and class size of 10 pupils. (Unfortunately the comprehensive school figures were not confined to A-level candidates, and thus included the class size figures of the 'new' sixth form as well as the A-level class sizes.) The interesting DES finding, which seemed to be a robust trend, raises a number of questions. Did larger schools, which had larger sixth forms, have better qualified or more effective staff? Did they have more able pupils? Was there something about small teaching groups which affected the teacher or the pupils adversely? The critical question to ask is whether pupils of equivalent abilities obtained grades which differed acording to the size of class they were in, that is, did class size correlate with achievement when entering abilities were 'controlled for'?

THE COMBSE PROJECT

A research project was started with the title Confidential Measurement-Based Self-evaluation (COMBSE) and this article reports some of the first year's work. Before describing the project, an explanation of its title is in order.

Confidential. Data are collected under code names and while all schools have access to the data collected, each individual school knows only its own code-name. Thus schools are able to compare their pupils and their results with those of other schools, but do not know the exact identity of other schools. Reports are sent to the LEAs, or for publication in research journals, only after first being given to participating schools for comment.

Measurement-based. The aim of this research is to find *measurable* aspects of pupils, schools and teaching strategies which can be demonstrated to relate to examination results and to pupils' satisfaction with school. The research is *not* premised on any

particular model or philosophy of how schools should teach A-levels or what their policies should be.

Self-evaluation. It is quite certain that there will be many variations in A-level results which will not be explicable in terms of the data collected. Schools will be the final interpreters of their own particular set of results. However, by extending the areas that have been measured, the self-evaluation can be more informed. The school's own observations and interpretations, discussed with researchers, are an invaluable help in the generation of hypotheses and therefore in guiding the development of the instruments year by year. Progressive focusing happens in quantitative work too.

PROCEDURES

Two Directors of Education were approached and with their permission secondary schools in these two authorities were contacted by letter. Ten elected to take part which represented nearly half the maintained schools. At a first meeting to explain the project, representatives from the schools recommended concentrating initially on English and Mathematics as two well-subscribed A-levels.

The Sample

For English A-level the sample consisted of 117 pupils from 12 classrooms in nine schools while for Mathematics A-level data were available for 162 pupils also from 12 classrooms and also from nine schools, although not exactly the same nine schools as the English sample, since one school sent in results only for Mathematics and one school only for English. Eighty per cent of the English sample completed questionnaires and 77% of the Mathematics sample.

With only one exception, the schools had all been comprehensive for at least nine years. The exception had been comprehensive for six years. In the intake region for the schools there were private schools which would 'cream' these comprehensives and there were also 'college' alternatives available: a sixth form college as well as colleges of Further Education. While the sample was homogeneous in so far as being in one region of the country (a region generally regarded as depressed), being all established comprehensive schools and all being 'creamed', their sizes ranged from nearly 900 to 1600 (Mean 1139 pupils; SD 290) and they were located in rather different neighbourhoods. Information provided by the LEAs indicated that about six of the ten schools could be considered to be in under-privileged 'social priority' areas while four of the schools drew on a full spectrum of occupations, housing types, etc.

Pupil Questionnaire

A questionnaire for pupils, consisting of 58 items, collected a variety of information including: O-level grades; parents' jobs and educational backgrounds (from which several indices of socio-economic status (SES) were computed); pupils' self-reported effort levels as indicated by the time they estimated they usually spent on homework; the extent to which they obtained help from parents, siblings, and other pupils; and their level of satisfaction with school. The questionnaire was administered in the summer term shortly before pupils sat for their A-level examinations.

Teacher Data Sheets

Teachers completed one data sheet for each A-level teaching group (each 'class'), shortly before the A-level examinations. This provided information on time-tabled time, class size, characteristics of the teachers and ratings of each pupil's effort and aptitude for the subject.

A-LEVEL RESULTS

Table I shows the distribution of A-level grades obtained by the English and Mathematics candidates. For comparison, several other distributions are shown. (These comparisons are made by way of setting the sample in context; there is no claim that the schools participating in the COMBSE project were representative of comprehensive schools in the north-east. Comparing schools in the north-east with the rest of the country was not an aim of the project.)

TABLE I. *The distribution of A-level grades for the Combse sample compared with other distributions*

	Percentages (rounded)						
Subject/Sample	F/O	E	D	C	B	A	Pass
SSEC(a) recommendations 1960	30	20	15	10	15	10	70
English							
Combse ($n=111$)	30	29	14	12	10	5	70
ILEA(b)	26	26	18	10	14	6	74
AEB	15	21	27	21	10	6	85
Cambridge	25	30	13	10	13	8	75
JMB	28	20	25	11	18	11	72
London	33	13	13	16	17	8	77
Oxford	28	21	17	11	16	7	72
Mathematics							
Combse ($n=119$)	44	16	11	15	8	5	56
ILEA(b)	45	15	15	12	10	3	55
AEB	42	24	10	9	10	6	58
Cambridge (syll.B)	30	19	8	10	17	15	70
JMB (syll.A)	30	18	16	9	14	13	70
London	26	15	15	10	19	15	74
O. C(SMP)	30	13	13	16	14	14	70
Oxford	30	17	17	10	15	11	70

(a) Secondary Schools Examination Council as cited in JMB (1984).
(b) Inner London Education Authority as cited by Cox & Marks (undated).

The distribution of grades recommended by the Secondary Schools Examination Council (SSEC) in 1960 has served as a rough guide for examination boards although considerable misgivings about it have been voiced (JMB, 1983).

With a failure rate in English of roughly the 30% which SSEC recommended and which examination boards aim for, the English results for the sample were fairly consonant with the national results.

In Mathematics the failure rate was 44.5%, considerably higher than nationally

and very similar to the rate of 44.6% reported for the Inner London Education Authority (Cox & Marks, undated).

VARIABLES RELATED TO A-LEVEL PERFORMANCE

Prior Achievement

The correlations between pupils' O-level and A-level grades were .20 for English and .35 for Mathematics, lower than the .37 and .58 reported by Miles (1979). As a general principle the more measurements one makes of a variable, the more valid and reliable one's aggregated measurement becomes. Thus it seemed likely that a measure of prior achievement based on *all* a pupil's O-level grades would be a better predictor than the grade in just one subject.

Using pupils' examination grades at O-level and CSE, what index was best for predicting A-level grades? One might concentrate on quantity: the sheer number of O-level passes. Quite apart from the fact that this would ignore the range of quality within the passing grades, there is also the problem that the number of subjects for which a candidate was entered might reflect not just the candidate's achievements but also the school's entry policies. The number of 'good' O-levels might be used, particularly since five good O-levels (C or better) is a common criterion for university entrance. Gray, Jesson & Jones (1984) used the percentage of pupils obtaining 5 or more good O-levels (or CSE grade ones) as their 'high hurdle' index. However, this index fails to give credit to the candidates who have attempted many subjects as opposed to concentrating on a few, and, more seriously, it treats a C as equivalent to an A, a procedure which may well be unwise in trying to predict for A-levels. A scale derived from summing the grades obtained would seem to incorporate both measures of quality and quantity but would again involve the difficult-to-assess factor of schools' entry policies.

Four indices were computed for each pupil: the *number of passes*, *number of good passes*, the *sum of points* per pupil (points were on a scale beginning with 7 points for an A at O-level, 6 for a B, 5 for a C or for a CSE grade 1 and so on) and the *average* grade attained. In this sample the *average* O-level grade, an index of quality rather than quantity, was found to be the best predictor for A-level grades. The correlation between average O-level grades and A-level grades was 0.58 in English and 0.60 in Mathematics, an improvement over prediction from the single relevant A-level. In contrast Miles (1979) analysed the correlations with the mean O-level score "omitting the least academic subjects". This did not 'appreciably' improve prediction in his sample. (Miles, 1979, table LV p. 83) On the basis of average O-level grades the English candidates, with a mean O-level grade of 5.3, were a somewhat less able group than the Mathematics candidates whose mean O-level grade was 5.6 on the seven point scale described previously.

One problem which schools face is how to counsel weak students who wish to attempt A-levels. In the present sample, some schools had a policy of looking for an A or a B at O-level in a subject before it could be attempted at A-level. The more common situation, however, was that schools would accept candidates who wished to tackle A-levels, without requiring minimum qualifications. A sufficient number of candidates who had a C at O-level were included in the present sample to permit some preliminary analysis of their chances at A-level to be examined. Since there would have been self-selection or selection by the school, the results for these candidates probably represent an optimistic prognosis for C-standard candidates in general.

How did those with only a C-standard fare in comparison with those who had reached an A or B standard at O-level? In English, a C-standard candidate apparently had a 59% chance of passing A-level, although only a 15% chance of getting a C or better. In Mathematics, the situation was quite different and the C-standard candidate had only a 14% chance of an E. No C-standard candidates obtained better than an E in this sample in 1983. (This presented an even gloomier prospect for C-standard candidates than was noted in the Cockcroft report drawing on the DES 10% Leavers Survey. C-standard candidates in that large sample had shown roughly a 39% chance of passing during the years 1977 to 1979.)

TABLE II. *Relationship beteen grades which pupils attained at O and A levels*

			Per cent obaining A-level grades							Pass rate
		n	F[(a)]	E	D	C	B	A	%	(%)
English										
O level:	A	16	12	25	25	6	13	19	18	87
	B	38	21	29	13	16	16	5	43	79
	C	34	41	26	18	6	9	0	39	59
Total		88[(b)]	27	27	17	10	13	6	100	73
Mathematics										
O level	A	38	18	18	16	16	18	13	35	82
	B	49	35	20	14	22	6	2	45	65
	C	21	86	14	0	0	0	0	20	14
Total		108	39	18	12	16	9	6	100	61

Notes: (a) F includes an O level pass.
(b) Not all pupils completed a questionnaire hence the distributions are slightly different from those in Table I, being based on a smaller sample.

While a C in O-level Mathematics meant a poor prognosis, an A was no guarantee of a good advanced level grade. For such pupils each A-level grade was about equally likely. The probability of failure, however, was only about 17%.

To enter a weak candidate for A-level can be seen in both positive and negative terms: as giving a youngster a change and extending his or her horizons, or as 'a cruel confidence trick' (Cox & Marks, undated) The cost-benefit ratio for this decision must be exceedingly complex and would require setting values on such concepts as: the sixth form as an educational experience; the opportunity costs involved in postponing the search for work; the incremental costs to the school of adding one more pupil to an A-level group, the cost to the community of pupils who would probably have been unemployed if they had not stayed on, and many other factors beyond the scope of this study at present. However, the pupil's chance of passing at A-Level *would* be one of the important factors in a cost-benefit analysis, perhaps one about which pupils should be appraised.

Cox & Marks implied that it was *small* sixth forms which accepted less well qualified pupils for A-level work. In this sample, however, the situation seemed to conform better with a hypothesis suggested by one of the schools: that it was the larger schools which will take on weaker candidates. The larger schools were also the

ones with larger numbers of high SES parents, and it could be that the pressures to accept weak candidates for A-level work were stronger there.

In summary, prior achievement was a strong predictor of A-level grades. In particular, high quality of grades at O-level presaged good A-level grades and the mean O-level grade provided a better predictor than single subject grades or measures reflecting quantity. Judging by average O-level grades, the Mathematics candidates were somewhat more able than English candidates. It is worth noting that, with the higher failure rate in Mathematics, as many as 16–20% of pupils who failed Mathematics might have been expected to pass had they taken English.

Socio-economic Status (SES)

Father's occupation, classified using the Registrar General's Scale (RGS), is often used alone as an SES index. It is a piece of information which is often available in school records, and so it was retained as a variable in this study. However, it was anticipated that the amount of education parents had received might also be important. The ages at which each parent left school were combined with father's employment status and job classification to yield an SES index. The mother's job classification was not included because too many mothers were not working outside the home and so could not be classified by occupation.

There were substantial differences between the schools in the fathers' occupations, as reported by pupils, ranging from some A level groups with *no* fathers in professional or semi-professional jobs (RGS 1 or 2) to others with nearly 90% in professional jobs. Overall, 47% of the English candidates and 60% of the Mathematics candidates had professional fathers. The small size of A-level teaching groups meant that even these substantial differences were not 'statistically significant'. However, using the more complex SES index, rather than simply the classification of the father's job, some statistically significant differences were apparent between A-level classes in the various schools. In English, this SES index contributed some statistically significant variance (though only 2%) in the prediction of A-level grades, after O-level grades (predicting 34%) had been entered into the regression. In Mathematics, however, the index contributed nothing. In other words, considering the A-level grades which would have been expected on the basis of their O-level grades, pupils from more educated and professional homes did slightly better than expected in English. In Mathematics home background had no detectable effect above that already included in O-level performance.

In summary, although many studies have shown SES related to achievement even after ability levels have been equated, in these comprehensive schools, for pupils who entered the upper VIth form, home background seemed to play a negligible role. SES is likely to have played a role in the decision to stay on into the sixth form, but this relationship could not be investigated with the present set of data.

Pupil Effort: time reported spent on homework

The pupils within each school reported quite variable amounts of time spent on homework, the amounts being mostly between two and six hours per week. (Homework in a subject was defined as all work in the subject done outside lessons.) From school to school, however, the averages were remarkably similar. In English the average was 270 minutes per week (4.5 hours, SD 2.5 hours) and in Mathematics it was 260 minutes per week (4.3 hours, SD 2.5 hours). One school

stood out, however: pupils reported spending nearly eight hours per week on both English and Mathematics. This was largely accounted for by the school policy of required supervised study in school time. In another school only 2.4 hours per week was the average for Mathematics and yet another school stood out as having only two hours per week reported for English. For the extremes, the differences among schools were statistically significant. (By contrast, there were no significant differences among schools on reported minutes per weekday evening spent watching TV (mean 1.8 hours., SD 1.28, for the Mathematics sample; mean 1.4 hours., SD 0.88, for English sample) nor on the habit of watching TV while doing homework. The majority (70%) reported this as happening 'never', 'rarely' or 'occasionally'.)

Coulter (1983) wrote of homework as a "neglected research area" and there is indeed little data available with which to compare these means. A study in the US by the National Opinion Research Center, covering 58,000 pupils of sixth form age in US high schools, yielded mean hours per week spent on homework as 4.42, standard deviation 1.41 (Walberg & Shanahan, 1983). If the COMBSE sample pupils were taking two or three A-levels and spending equal amounts of time on each they were spending roughly two or three times as much time on homework as US students of the same age.

COMBSE respondents reported less than half as much time spent watching TV as US respondents. It must be remembered, however, that the comparison here is between the select voluntary group of A-level candidates and the generally unselected total cohort of US students who are still in school because the normal leaving age is 18.

It is often observed that pupils are shocked by the increase in difficulty of A-level work over O-level work and they may, as a consequence, underestimate the time they need to commit to their studies. "Must try harder" is a constant refrain. There seemed to be a possibility that the COMBSE project could provide schools with hard data showing that pupils who spent more hours on homework would get higher grades at A-level, a graph showing the rewards of hard work. Unhappily, perhaps, such a graph was not forthcoming from the data.

Despite the large variation in amounts of time pupils reported spending, the figures for time spent on homework bore no significant correlation with A-level grades obtained. The simple correlations were 0.05 for English and $-.12$ for Mathematics. These findings were at variance with data from many studies in the US suggesting a correlation between time spent studying and achievement. Walberg & Shanahan (1983) for example, reported a mean of 0.24 for the correlation between homework and achievement from the *High School and Beyond* study of 58,000 16 and 17-year-olds. Wolf (1979) found correlations between homework and achievement for twelfth graders (17-year-olds) of 0.16 in literature and 0.46 in science.

In the present data, pupils who reported working more than 3.7 hours per week on their subject had lower grades than pupils who reported working less than 3.7 hours per week, even when comparisons were made within ability levels, using mean O-level grade as an index of ability (see Table III).

Partial correlations between reported time spent and grades achieved, controlling for ability, were -0.03 ($n=78$, $p=.41$) for English and -0.16 ($n=98$, $p=.06$) for Mathematics. Examining scatterplots for Mathematics suggested a curvilinear relationship with maximum grades achieved by pupils reporting low moderate levels of effort. Splitting the sample at median values to yield four groups defined as high and low ability pupils and high and low effort pupils, the general pattern to emerge was

TABLE III. Correlations between time reported spent on homework and A-level grade for four groups defined by prior achievement and level of effort

Subject	English		Mathematics	
Effort level:	Low[a]	High	Low	High
HIGH O-levels (b)				
n	16	24	23	29
Mean A-level grade	3.1(C)	1.9(D)	2.8(C)	2.0(D)
r	.43*	.34*	.16	−.34*
LOW O-levels				
n	18	24	19	27
Mean A-level grade	1.1(E)	1.0(E)	1.0(E)	0.85(E^-)
r	.05	.26	0.00	−.10

*$p<.05$

(a) Low effort was defined as reporting less than 224 mins. per week (3.7 hours per week) on homework for the subject.

(b) In English, 'high' average O grades were above 5.3 on the scale beginning A=7 (roughly C^+ and better).
In Mathematics 'high' average 'O' grades were above 5.6 (e.g. more Bs than Cs).

that pupils reporting above average effort achieved *lower* A-level grades, in both subjects at both ability levels. In English, however, *given high ability*, higher effort might have paid off in higher grades; the correlations were significant and positive although weak. In Mathemtics, in the above average effort group for pupils who had done well at O-level there was a significant negative correlation between hours spent on homework and A-level grade achieved. This negative correlation could be an index of struggling, of pupils dealing with work which was of a level of difficulty such that the able finished promptly but the less able struggled on unproductively. Such negative correlations between time and achievement appear rarely in the literature (e.g. Anderson, 1984; Denham & Lieberman, 1980) but have been considered theoretically by Frederick & Walberg (1980). The occurrence of negative time-achievement correlation in this set of data is probably due to the level of difficulty represented by UK A-level work. This level of difficulty is probably matched in the US (the source of much of the time-and-achievement literature) only by their 'Advanced Placement' examinations, which are not even offered in many high schools.

In summary, the great variability in time reportedly spent on homework seemed to behave like an individual pupil characteristic, only occasionally influenced by school practices. The school with the required supervised study periods did not get better results than other schools with similar pupils. (Removing this 'outlier' from the sample had little effect on the pattern reported in Table III except for a positive correlation of 0.33 for low effort high ability pupils in Mathematics.)

It could be suggested that the weaker candidates were reporting longer hours on homework than they actually spent, but the findings were fairly consistent across many schools in both subjects, making the errors of self-report a less viable explanation.

It seemed there was no support for the thesis that exceptionally long hours spent

on homework would lead to higher A-level grades, except possibly for high ability pupils taking English.

Class Size

For the present sample the mean class sizes were 9.7 for English and 13.5 for Mathematics. By correlating class size with the means for each classroom on pupil level achievement data, it could be seen that the DES analysis suggesting that larger classes obtained higher grades (DES, 1981) was borne out for English (r = .69) and that the effect remained when residual gains were examined (r = .50) (Table IV). In other words, even when allowance was made for the fact that schools with larger sixth form classes had more able pupils, there was still an apparent tendency for pupils of similar abilities to get better grades in large English classes than in small English classes. Perhaps the stimulus of discussion and debate is needed in A-level English more than is the individual attention of the teacher.

TABLE IV. Correlations of teacher and school variables with actual and residual A-level grades

	Correlations			
	English		Mathematics	
Teachers	Actual[a]	Residual[b]	Actual	Residual
Years of experience[c]	.04	.41	−.02	−.12
Number of inexperienced teachers	−.09	.07	−.14	−.23
Academic specialisation[d]	.15	−.14	.30	−.10
Schools				
Time allocated (timetable)	−.44	−.09	−.51*	−.28
Class size	.69**	.50*	.10	.03

* $p < .05$

** $p < .01$

(a) Actual mean A level for the teaching group, measured on the scale A = 5, B = 4, C = 3, D = 2, E = 1, F or O-level pass = 0.

(b) A-level score adjusted to take account of pupil ability (average O-level grade) and, in English, SES of parents.

(c) Mean years of experience of teachers on a 5 point scale 0–2 yrs = 1 'inexperienced', 3–5 = 2, 6–10 = 3, 11–15 = 4, 16+ = 5.

(d) Coded 2 for a degree in the subject, 1 for lesser specialisation (e.g. course in a teaching certificate).

The situation, however, was quite different in Mathematics: class size appeared to have no effect on achievement. It should be noted that no class exceeded 19 in size, and so all classes were small by the standards applied lower down the school.

In summary, in English, very small classes (say two to six pupils) had lower than expected grades whereas larger classes, (say 7 to 16 pupils) had higher than expected grades. In Mathematics, with classes ranging from 5 to 19 there was no relationship between class size and achievement. This suggested that class-size effects should be considered separately for different subjects, possibly because different subjects demand different teaching methods. Perhaps the DES could present national data broken down by subjects.

Time Allocated to the Subject on the Timetable

Most schools allocated 280 minutes per week (eight times 35 minutes, usually as four double periods) or 300 minutes per week (five one hour lessons.) Although representing only 20 minutes per week difference, these small differences add up to about 12 hours over a school year. It has been argued that such small differences, accumulated, are significant (e.g. Wiley & Harnischfeger, 1974), and that the allocation of time is "a potent path for policy" (Wiley, 1973). Indeed school days have been lengthened in the US recently, partly in response to research on time variables. However, the case is by no means obvious or proven. Psychological time, time distribution and quality may outweigh simple quantity and teacher preference and pupil type may interact with lesson length and quantity per week.

In the present sample it seemed that schools getting generally lower grades had allocated more time to A-level instruction—an index of anxiety?—but the correlation of time allocated with residual gain was not significant for English or Mathematics. This is not to say the extra time allocated in some schools was not effective. It could be argued that the schools obtained results in line with the prior achievement levels of their pupils by several strategies, one being the appropriate allocation of time.

Time the Student Attended Classes: pupil attendance

One quarter of pupils taking A-level English reported absences of fewer than four days; 50% reported fewer than eight days and three-quarters reported 15 or fewer days of absence from school during the three upper sixth school terms. Mean absences across the A-level classes varied from 6 to 30 days yet absence contributed nothing to the prediction of A-level English grades. This was the case whether pupils' self-reported absence was used or teachers' ratings. In Mathematics the picture was similar with the exception that for pupils showing high ability but low effort, high absence was significantly associated with lower residual gains. In Mathematics, it seemed, there were high ability pupils who learned mainly by attending classes. For these pupils, absence from class *did* affect achievement.

Teacher Variables

There was considerable variation in years of experience as a teacher of A-level work, ranging from 0 to more than 20 years. Counting as 'inexperienced' any teacher who had taught A-level for less than 2 years, only five classrooms had inexperienced teachers and these were generally assigned to be shared with one or more experienced teachers. The majority of A-level teachers (65% in English and 70% in Mathematics) had taken a single-subject first degree in the subject they were teaching. In English only 3% had not taken English as the whole or at least a part of a subject-based degree course and in Mathematics the figure was only 14%. The 3% in English and 14% in Mathematics had almost all taken the subject they were teaching as a major subject in a B.Ed.

None of these variables, the years of experience, the number of inexperienced teachers or the degree of specialisation in the teachers' preparation, showed a statistically significant relationship with achievement, although years of experience as a teacher of A-level English looked promising ($r = .41$). It should be noted, however, that schools take considerable care in the selection of teachers for A-level

work and most of the A-level classes were not dependent upon a single teacher. The lack of effects cannot be taken as meaning that these teacher characteristic variables are unimportant: It remains an open question.

Pupils who Passed Compared with Pupils who Failed

Since the difference between passing and failing at A-level is psychologically so important, and is possibly important also in job-hunting and in applications for higher education, the data were examined for variables on which pupils who passed were most different from those who failed. In *English* the most discriminating variable ($F=31.26$, $p<.001$) was the pupil's O-level Mathematics (*sic*!) grade. Those who failed had an average of CSE grade 4 or an O-level F in Mathematics whilst those who passed A-level English had a C-average in Mathematics (4.9 on the scale with $A=7$). Teachers' ratings of pupils' ability were also highly discriminating as were the average O-level grades. Those who failed had an average of 4.91 (roughly a C) whereas those who passed had obtained average O-level grades of 5.55 (for example, a mixture of Bs and Cs in about equal quantities).

In *Mathematics*, the most discriminating variable was the teacher's rating of the pupil's level of ability. ($F=64.17$, $p<.001$). This result might not seem surprising in the UK but there is a large literature in the US on the lack of correlation between teachers' ratings and measured achievement. In this set of data, the correlation of O-level Mathematics with A-level grade was .35 whereas the correlation of teacher's rating of the pupil's ability with the A-level grades was .74. One teacher commented that it was how the pupil tackled Algebra which was important in predicting A-level work, not the O-level grade, and this comment was perhaps indicative of one of the ways in which teachers' judgments can become better predictors than test scores.

The O-level Mathematics grades of those who failed were high: almost a B average (5.8 on the $A=7$ scale). Those who passed had an average of 6.5 (i.e. roughly half had Bs and half had As). While these differences were highly significant statistically they were of little practical use since pupils with a B in Mathematics were quite unpredictable. For those who failed, the average of *all* their O-level grades was 5.3 and for those who passed it was 5.9 ($F=21.07$, $p<.001$). Thus pupils hovering nearer to Cs than Bs across all subjects were likely to fail Mathematics. Those with a B average were likely to pass.

DIFFERENCES AMONG SCHOOLS

Were some schools more successful than others in getting their pupils through A-levels? When A-level results were examined with O-level averages controlled for, using residual gain analysis with the pupil as the unit of analysis, most classes had means showing no significant differences. That is, the results at A-level were almost entirely those which would have been expected from randomly selected groups which had the O-level characteristics found in these classes. Most classes were equally effective. If one were willing to use Least Significant Differences rather than the more conservative Scheffé procedure for *post hoc* testing, one class in English with a mean standardised residual gain of 0.58 had significantly better results than two classes with standardised residual gains of -1.17 and $-.72$. But not much emphasis should be placed on this finding as yet. The numbers involved were small and the important question will be whether the same classes are doing relatively well and relatively poorly in subsequent years. Without such stability in the results, they

are hardly worth examining. In Mathematics, the situation was similar. Classes with mean standardised residual gain scores of .77 and −.82 were significantly different on the LSD multiple range test but not on the Scheffé.

Although no emphasis is placed on these results at present, the differences between the classes were far from trivial. For pupils with very similar O-level averages some classes had no results higher than an E whereas others had a spread of results up to a B. Differences in the effectiveness of A-level teaching are not the only possible explanation for this kind of difference. It could be that some schools had taught O-level so well that they now appeared to have more able pupils for A-level than was in fact the case. Or again, there could be effects due to the composition of the class. The lack of able pupils in a class, for example, might depress achievement of all pupils. The fact that 80% of pupils reported turning to other pupils for help might suggest one of the ways in which the composition of a class might affect achievement. Pupils learn from each other as well as from the teacher.

As has already been noted, a number of characteristics which might have been thought of as influential showed no relationship to residual gains. Lack of significant relationships can sometimes be due to lack of variation in the factors measured but that did not seem to be the explanation here. There *were* variations in the characteristics of classrooms, such as teacher characteristics and time allocated, and no fewer than five different examination boards were used. Yet none of these characteristics seemed to affect the rule that A-levels were well predicted from average O-level grades.

TWO ISSUES

Is the 'Required' 30% Failure Rate Reasonable?

As already mentioned, questions have been raised by the examination boards about the SSEC recommended distribution of grades. In particular, the narrow band of 10% of candidates who should be awarded a C grade has been criticised by the JMB in a specially prepared pamphlet titled "Problems of the GCE Advanced Level Grading Scheme". They pointed out that this recommended percentage of candidates, in the region of the overall distribution where many candidates cluster, has resulted in the difference between a B and a D being as little as 4% in English and 7.7% in Mathematics (JMB, 1983 p. 9). Given the heavy reliance on A-level grades by universities and polytechnics and the emphasis on 'points' and actual grades for conditional acceptances, this narrow band for C grades could indeed make important life-chances hang on a few marks.

The part of the distribution perhaps felt most keenly by candidates is the failure rate. The norm that 30% are expected to fail makes the A-level examination bound to leave many students feeling they have nothing to show for two years of work. (The O-level pass is no compensation in subjects like English and Mathematics in which practically all candidates already have an O-level pass in the subject.)

Perhaps the failure rate is thought necessary to maintain the undoubtedly high status of an A-level pass. However, one might expect an examination grade to bear some relationship to the achievement level for which it serves as a credential. In other words, one might expect that an examination certifies or validates real achievement. It is generally agreed that almost all pupils who have taken an A-level course have reached a much higher level of achievement than pupils who stopped at O-level. Yet the ostensible message of an F or an O grade is precisely that two years

of study have left them unaltered. The A-level examination system fails to certify certain recognised levels of achievement.

One of the criticisms levelled by Cox & Marks was "many pupils are being entered for public examinations which they have little or no chance of passing". With a required 30% failure rate this situation is bound to be true. (It is equally true that many pupils are being entered for examinations which they have an excellent chance of passing). Sir Keith Joseph's recognition that the built-in failure rate of norm-referenced tests was discouraging for low ability pupils applies also to the high ability and frequently hard-working pupils in sixth forms. Perhaps it is the required failure rate which should be questioned, rather than schools' policies. One must, in any case, consider the benefits of personal growth and increased learning even if a pupil has "failed" at A-level, and consider also the alternatives and financial costs and benefits for the student and the tax-payer. How does the cost of having a pupil in the sixth form compare with having a pupil on the dole? And what effects do the two rather different experiences have on later patterns of behaviour?

Many pupils spontaneously commented that they faced dismal alternatives to staying on for A-levels. The following were some responses to the simple, non-leading question "How do you now feel about having stayed at school to take A-levels?":

> It was the only thing I could have done, jobs being the way they are (English candidate)
> ... better than the dole and than a job which I wouldn't want (English candidate)
> I only really stayed on to better myself until a suitable job came vacant but I am pleased... I have enjoyed the course very much (English candidate)
> Better than the 2 years on a scheme! (Mathematics candidate)
> I think it's better than being on the dole or getting some job where you won't be happy (Mathematics candidate)
> Also there was nothing else I could have done (Mathematics candidate)
> ... has kept me off the dole (Mathematics candidate)

Should the Difficulty of English and Mathematics A-levels be Equated?

The difficulty of an examination subject can be defined in terms of the probabilities of passing for pupils of equivalent general abilities. Should these difficulties be equated? Is the mathematics examination too difficult and should it be brought closer to equivalence with the English A-level? The difference in 'severity' of different subjects has been recognised (Nuttall, Backhouse & Willmott, 1974; Cockcroft, 1982) but the implications of these differences for national policies and for personal decisions have received little attention. Should pupils be counselled to take English because, with equivalent abilities as indexed by their O-level grades, they have a better chance of passing English? Which subjects do they enjoy? Which subjects will assist their future careers or their use of leisure? In which subject does the country need qualified persons? Perhaps the arrival of AS levels will make the choices a little easier for pupils.

CONCLUSIONS

There has been considerable debate about the effect which the type of school (selective or comprehensive, maintained or private) may have on examination

results. (Marks, Cox & Pomian-Srzednicki, 1983; Gray, Jesson & Jones, 1984; Steedman, 1983) Nobody, however, suggests that it is inherently impossible for one type of school to be as excellent as another type of school. For comprehensive schools, which now educate the vast majority of children, the important task is to monitor results and interpret them with reference to intake characteristics in order to make sure all pupils are getting a fair chance to succeed in a sensible system of examinations. This requires consideration not only of school and classroom practices but also of examination conventions. The basic examination content and procedures have not been questioned here but questions have been raised about the levels of difficulty of the various subjects and the expected 30% failure rate.

In this first year of a continuing study, A-level results have been seen to be quite strongly predicted by teacher assessments and by prior O-level achievement data. Home background seemed to have little effect, except possibly in English. Long hours spent on homework presaged poor results and, in English but not in Mathematics, larger classes seemed to obtain better results than smaller classes. Mathematics O-level performance was the variable on which candidates in this sample who failed A-level English were most different from those who passed it.

No effects on A-level results were detectable for such simple characteristics of teachers as years of experience or level of specialisation in the subject, nor for the amount of time made available on the time-table for A-level instruction. Within the ranges encountered for these variables, effects were not detectable. Indeed, using conservative statistical procedures it could be said that all classes were obtaining the A-level results one would expect, knowing the O-level achievements of their pupils. However, there were some substantial differences in achievement which, if repeated year by year, would suggest that some schools were getting better results in some subjects than were other schools, and this would need close investigation. A-levels are important passports, for which pupils work, apparently, about three times more hours per week than US pupils of the same age. They deserve a fair chance in a fair system. By participating in this study these schools are expressing their concern that pupils should get no less.

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