READING AND SOCIO-ECONOMIC BACKGROUND: A PROGRESSIVE ACHIEVEMENT GAP?

M. O. Martin*

Educational Research Centre
St Patrick's College, Dublin

Evidence for a progressively widening gap in the reading attainments of pupils from different socioeconomic backgrounds was sought in a population of Irish school children drawn from 107 schools. Pupils in standards 3 through 6 were tested annually over a four-year period on standardized tests of English and Irish reading. Both cross-sectional and longitudinal analyses were carried out. Some evidence was found to indicate that differences in attainment between socioeconomic groups increase over time, though the differences were less pronounced that those found in British studies.

There is considerable evidence that the mean level of scholastic attainment of children from less advantaged socio-economic backgrounds falls below that of children from more advantaged backgrounds. What is less certain is whether this gap in attainment, which is visible from an early age, increases, remains constant, or decreases over the period of primary schooling.

Research on this topic has been carried out in the United States and in Britain. The work of Deutsch and his associates (3) in the United States has done much to popularize the notion of a progressive gap in cognitive attainment between children from more and less advantaged backgrounds. Working with both black and white children, these investigators have reported a progressive decline in the cognitive performance of less advantaged children relative to their more advantaged peers over the period of first to fifth grade. The decline was more noticeable for verbal abilities, such as reading and vocabulary, than for non-verbal ones. In accounting for the observed progressive decline Deutsch hypothesized an underlying process of 'cumulative deficit'. Such a hypothesis presupposes a hierarchical arrangement of cognitive attainments, with skills and abilities acquired at an early age forming the foundation upon which later attainment is built. Children who fail to acquire the fundamental skills at an early age are doomed to fall further and further behind their peers; hence the term 'cumulative deficit'.

* Requests for off-prints should be sent to M. O. Martin, Educational Research Centre, St Patrick's College, Dublin 9.

The findings of Deutsch were based on a sample of deprived children from a ghetto area; there is also some evidence of a progressive achievement gap between some sections of the more general school-going population. In 1966, Coleman and his associates (1) provided extensive data on the comparative scholastic attainments of the major ethnic and racial groups in the United States. Except in the southern regions of the country, a more or less constant difference of approximately one standard deviation (based on whites in the metropolitian Northeast) was found across grades between blacks and whites in verbal ability and reading comprehension. In other words, evidence for a progressive achievement gap between blacks and whites was not found outside the South. However, in the non-metropolitan South, the average black-white difference in reading comprehension was found to increase from 1.2 units in grade 6 to 1.6 units in grade 12, while in the non-metropolitan Southwest, the difference increased from 1.0 unit in grade 6 to 1.4 units in grade 12. These findings are taken as evidence of a progressive achievement gap in reading comprehension between the blacks of the non-metropolitan South and the whites of the metropolitan Northeast.

Support for this position comes from other studies of intelligence and achievement of black children in the southern states (20, 21). In these studies a clear relationship was noted between the home background of the children, as measured by parental occupation, and intelligence and achievement. This was true despite the fact that the children in the sample were of predominantly low socio-economic background. More important from the progressive decrement perspective is the fact that a follow-up study showed that performance of the group on the achievement tests, including tests of reading vocabulary and reading comprehension, had declined considerably relative to national norms. This occurred to such an extent that the average achievement level for black children in the tenth grade was only 7.1 grade equivalents for reading vocabulary and 7.3 for reading comprehension.

Jensen has paid considerable attention to the question of a progressive achievement gap between blacks and whites, although more in relation to general intelligence than to attainments such as reading. In one study conducted in a California school district he compared the attainment of blacks and Mexican-Americans with the attainment of white students in grades one to eight (17). A reliable and systematic increase in the gap between these groups was found from grade one to three; from grade four to eight, however, the gap remained constant. No such increase was found on a number of non-verbal intelligence tests which were also administered. Jensen concluded that the progressive gap evident for the achievement tests in the earlier grades was due to the strong verbal loading of the tests, rather than to a progressive decline in general intelligence in the black and Mexican-American groups.

The evidence from American studies is difficult to interpret since racial and social class factors are so often confounded. Perhaps more relevant to the situation in this country are the results of a number of British studies. Douglas (4) reported on a longitudinal study of a national sample of children in England and Wales, all born during the first week of March 1946. Over 3,000 of the children were tested for intelligence and attainment at age eight, and again at age eleven. The attainment tests included tests of reading comprehension and vocabulary at both ages. The children were classified on the basis of parental occupation as belonging to one of four social-class groups: upper middle class, lower middle class, upper manual working class and lower manual working class. The same pattern of results obtained for both intelligence and attainment tests. At age eight, approximately one standard deviation separated the highest and lowest groups. By age eleven, the average test scores for the four groups differed even more widely. There was a tendency for the two middle class groups to come closer together and to move further away from the working class groups. In a further follow-up study of the same sample the children were retested at age fifteen (5). In the case of reading, the social-class groups continued to diverge, although this trend was reversed for non-verbal intelligence.

A second British longitudinal study, the National Child Development Study, followed a cohort of children born over a decade after the Douglas sample — in March 1958 (14). Data from this study were used to examine the hypothesis that mean social-class differences in reading and mathematics attainment increase from age seven to age eleven (14). The 16,000 children in the study were categorized as belonging to one of three social-class groups: non-manual; skilled and semi-skilled manual; and unskilled manual. An analysis of covariance model was used to examine social-class differences in reading score at age eleven after controlling for reading score at age seven. The existence of a divergence in reading score between the social classes from age seven to age eleven was confirmed. At age seven, the children whose fathers were in non-manual occupations were 0.9 years ahead of children of skilled and semi-skilled workers in reading attainment. This group was in turn 0.7 years ahead of the children of unskilled workers. By age eleven, the gap had increased to 1.0 year between the non-manual group and the skilled and semi-skilled group, and to 1.1 years between this latter group and the unskilled group.

These findings were extended in a study in which the same cohort of children was tested again at age sixteen (15). This time reading attainment at both age seven and age eleven were controlled in an analysis of covariance

before examining social-class differences in reading attainment at age sixteen. The results were in agreement with those of Douglas, Ross, and Simpson a decade earlier. Even when attainment at ages seven and eleven were controlled, there were significant social-class differences in reading attainment at age sixteen.

The data from these two large-scale longitudinal studies in Britain provide clear evidence of a progressive reading gap extending from age seven to sixteen. Corroborating evidence comes from a small-scale study in which a sample of 52 children from culturally deprived homes was matched with a control group of children from more supportive working class backgrounds (2). Both groups of children were administered a battery of attainment tests at about age 7½ years and again when they were approximately 11½ years. Even after controlling for initial group differences on the reading tests, a considerable difference was observed between the scores of the deprived and control groups at eleven years of age. Expressed in terms of reading age, the control group gained 4.36 years over the four-year period compared to only 2.92 years for the deprived group. The study is significant insofar as it reveals a progressive reading gap between more and less deprived children from broadly similar working-class backgrounds.

Although data from Ireland are scarce, the findings of one study (18) are in broad agreement with the last study I have considered. In the Irish study, a group of disadvantaged children, following an intervention programme, performed at average level on a reading readiness test at age six. Two years later, however, the children scored over one standard deviation below the mean of a non-disadvantaged group on two reading tests. That this discrepancy seems to have emerged during a two-year period between the ages of six and eight years may be taken as tentative evidence of a progressive reading deficit in this disadvantaged population.

The present paper reports on an investigation into the reading attainments of children from different social-class backgrounds in a national sample of Irish primary schools. The aim of the study was to find out if the progressive reading gap between children from different home backgrounds which has been observed in samples from American and British populations would be found to obtain in a sample of Irish school children.

METHOD

Sample

A representative sample of Irish national schools (excluding private, Protestant, special, and one-teacher schools) was selected (19). Of 135

selected schools, data for the present study were obtained from 107 schools.

Dependent Variables

Drumcondra English Test, Level II, Forms A and B (Standards 3 and 4) (6,7).
Drumcondra English Test, Level III, Forms A and B (Standards 5 and 6) (8,9).
Drumcondra Irish Test, Level II, Forms A and B (Standards 3 and 4) (10,11).
Drumcondra Irish Test, Level III, Forms A and B (Standards 5 and 6) (12,13).
Scores of the vocabulary and comprehension sub-tests of these tests were combined to provide single 'reading' scores.

Tests were administered to all pupils present in each school at four grade levels (standards 3, 4, 5, and 6) at the beginning of four successive school years, 1973-74, 1974-75, 1975-76, and 1976-77, and again at the end of the 1976-77 school year. The tests were administered by classroom teachers. Form A of the attainment tests was used on all occasions except for the 1976-77 beginning-of-year testing, when Form B was administered.

Independent Variable

The independent variable was the socio-economic status of the child's home, based on the child's father's occupation as reported by the child's teacher. Occupations were assigned to one of seven categories: professional/managerial, white collar, skilled worker, unskilled worker, farmer with more than 50 acres, farmer with less than 50 acres, and unemployed or unknown. To simplify the presentation of results and also to correspond more closely to the categorization used by the British studies, these seven categories were collapsed into three broader groups as follows: professional/managerial, white collar, and large farmers were assigned to Group 1; skilled workers were assigned to Group 2; and unskilled workers, small farmers, and unemployed workers were assigned to Group 3.

Design

The study makes use of a combined cross-sectional-longitudinal design. It is cross-sectional in that data are available from several groups of children at different standards at the same point in time. It is longitudinal in that data were obtained on some groups of children on a number of different occasions. A group on which data were obtained more than once will be referred to as a cohort. Children in the study were divided into cohorts on the basis of their grade level in the first year of testing. There were four cohorts in all: Cohort 3 consisted of all children in standard 3 in the first year of testing, Cohort 4 of all children in standard 4, Cohort 5 of all children in standard 5, and Cohort 6 of all children in standard 6. Table 1 illustrates the layout of the data and shows the number of children present for each testing session. Cohorts may be identified in Table 3 by following

TABLE 1

NUMBERS OF CHILDREN AT EACH TESTING SESSION
BY STANDARD AND YEAR OF TESTING FOR ENGLISH AND IRISH READING
(NUMBERS IN PARENTHESES ARE FOR MATCHED LONGITUDINAL DATA.)

Standard	Test	Winter 1973-74	Autumn 1974	Autumn 1975	Autumn 1976	Summer 1977
6	English	3794(3794)	2159(1845)	2629(2021)	2471(619)	2374(619)
	Irish	3734(3723)	2092(1763)	2626(2062)	2494(575)	2382(575)
5	English	3697(1845)	2829(2021)	2664(619)		
	Irish	3800(1763)	2801(2062)	2665(575)		
4	English	3806(2021)	1852(619)			
	Irish	3811(2062)	1846(575)			
3	English	4009(619)				
	Irish	3931(575)				

the table diagonally from lower left to upper right. For example, the children in Cohort 3 were in standard 3 in winter 1973-74, in standard 4 in autumn 1974, in standard 5 in autumn 1976, and in standard 6 in 1977. Cross-sectional comparisons are made by comparing cells of the table vertically, i.e., standard 3 in winter 1973-74 with standards 4, 5 or 6 in the same year. Longitudinal comparisons are made by working diagonally across the table, i.e., standard 3 in winter 1973-74 with standard 4 in autumn 1974, or standard 5 in autumn 1975 with standard 6 in autumn or summer 1977.

RESULTS

The data analysis was carried out in two stages. In the first stage the mean reading scores for each social class group were computed from cross-sectional, unmatched longitudinal, and matched longitudinal data and compared and contrasted in order to assess the magnitude of the various sources of error associated with each method.* In the second stage, an analysis of covariance model was used to assess the effect of home background on reading attainment at a given time having controlled for reading attainment differences at an earlier time. The aim of both sets of analyses was to discover if differences between the social-class groups increased over time.

*Unmatched longitudinal data include statistics based on all children tested on any occasion. Matched longitudinal data involve only that core of children who have data for all test administrations (cf. 16).

TABLE 2

ENGLISH READING ATTAINMENT: MEAN READING SCORES FOR
EACH SOCIAL-CLASS GROUP FOR CROSS-SECTIONAL,
UNMATCHED LONGITUDINAL, AND MATCHED LONGITUDINAL DATA

Time of Testing

Cross-sectional and Unmatched Longitudinal

	Social Class Group	Time 1	Time 2	Time 3	Time 4	Time 5
	1	104.39	104.66	104.98	105.65	105.47
Standard 6	2	99.79	98.55	100.54	101.36	101.58
	3	95.05	95.10	95.05	96.62	96.08
	1	105.14	104.92	105.55		
Standard 5	2	99.07	99.47	100.45		
	3	96.00	95.12	96.40		
	1	104.98	104.59			
Standard 4	2	99.67	99.75			
	3	95.59	95.83			
	1	105.20				
Standard 3	2	100.02				
	3	96.80				

Matched Longitudinal

	Social Class Group	Time 1	Time 2	Time 3	Time 4	Time 5
	1	104.67	105.26	105.39	104.22	103.91
Standard 6	2	99.99	99.10	100.62	100.84	101.78
	3	95.26	96.62	95.80	95.07	94.72
	1	105.80	105.20	103.42		
Standard 5	2	99.01	99.76	101.12		
	3	96.86	95.90	95.27		
	1	106.30	103.82			
Standard 4	2	100.95	101.94			
	3	97.02	97.81			
	1	103.13				
Standard 3	2	103.13				
	3	98.01				

Stage 1

For each standard at each time of testing the rank order of the mean reading scores was always the same. Group 1, the professional/white collar/ large farmer group consistently earned the highest mean score. Next came Group 2, the skilled worker group. The unskilled worker/small farmer/ unemployed group (Group 3) was always in third place (Tables 2 and 3). The difference between the highest and lowest mean scores varied between one-half and two-thirds of a standard deviation. Since the rank ordering of the group mean was always the same, the size of the group effects can be conveniently expressed as the difference between the Group 1 and Group 3 means.

In Figure 1 this difference has been plotted for each data type for Cohorts 3, 4, 5, and 6 for English reading. Figure 2 contains similar plots for Irish reading. Looking first at the graph for English reading, and concentrating on Cohort 3 since this cohort had most testing sessions, it is evident that the differences are very similar for cross-sectional and unmatched longitudinal data, but that the matched longitudinal data follow a slightly different trend.

If the cross-sectional and unmatched longitudinal data can be taken as equivalent, it is possible to make some inferences about the adequacy of the data for investigating the hypothesis of a progressive reading gap. If two different data types control for different sources of error and yet give similar results, it is safe to say that the sources of error do not play a significant role in determining these results. As a case in point, cross-sectional data do not permit errors due to time differences, whereas unmatched longitudinal data do. However, since computations based on either data type give the same results in this instance, the implication is that time differences are not important. Similar conclusions can be drawn about errors due to cohort difference and retest effects. This leaves only cohort change effects or selection effects to explain the discrepancy between the results based on matched longitudinal data and those from the other two data types.

To conclude that the discrepancy is due to cohort change effects is tantamount to saying that the same cohort changes affected both the cross-sectional and unmatched longitudinal data in the same way, which seems unlikely. A more plausible explanation is that the discrepancy is due to a selection effect, whereby the requirement of complete data for the matched longitudinal data set resulted in the non-random elimination of a large number of cases. This explanation seems all the more likely since the discrepancy between the matched longitudinal and other data is greatest

TABLE 3

IRISH READING ATTAINMENT: MEAN READING SCORES FOR EACH SOCIAL-CLASS GROUP FOR CROSS-SECTIONAL, UNMATCHED LONGITUDINAL, AND MATCHED LONGITUDINAL DATA

Time of Testing

Cross-sectional and Unmatched Longitudinal

	Social Class Group	Time 1	Time 2	Time 3	Time 4	Time 5
	1	104.75	105.48	103.94	106.60	106.30
Cohort 6	2	98.36	98.67	98.67	100.63	100.40
	3	95.92	95.70	95.98	98.82	96.77
	1	105.44	103.62	105.22		
Cohort 5	2	98.64	98.12	99.81		
	3	97.23	96.17	97.25		
	1	104.19	105.39			
Cohort 4	2	99.05	99.68			
	3	96.31	97.82			
	1	104.95				
Cohort 3	2	100.16				
	3	97.15				

Matched Longitudinal

	Social Class Group	Time 1	Time 2	Time 3	Time 4	Time 5
	1	104.75	106.19	104.58	103.94	104.34
Cohort 6	2	98.36	99.15	99.25	99.79	99.40
	3	95.92	97.31	96.62	94.94	93.80
	1	105.91	104.62	102.45		
Cohort 5	2	99.36	98.40	99.41		
	3	97.65	96.48	95.46		
	1	105.64	105.91			
Cohort 4	2	100.29	102.65			
	3	97.59	98.00			
	1	105.32				
Cohort 3	2	102.48				
	3	99.73				

FIGURE 1

ENGLISH READING: DIFFERENCE BETWEEN HIGHEST AND LOWEST GROUP
MEAN FOR CROSS-SECTIONAL (CS), UNMATCHED LONGITUDINAL (UL)
AND MATCHED LONGITUDINAL (ML) DATA FOR EACH COHORT
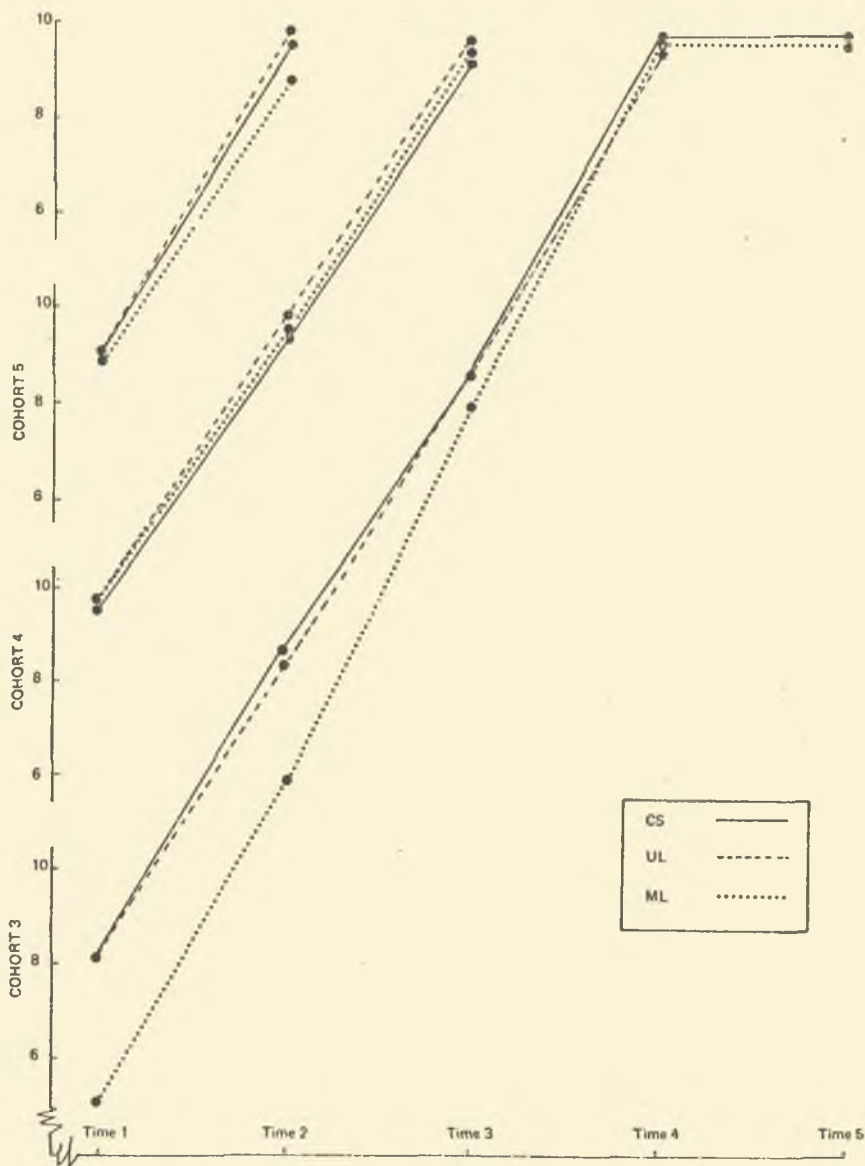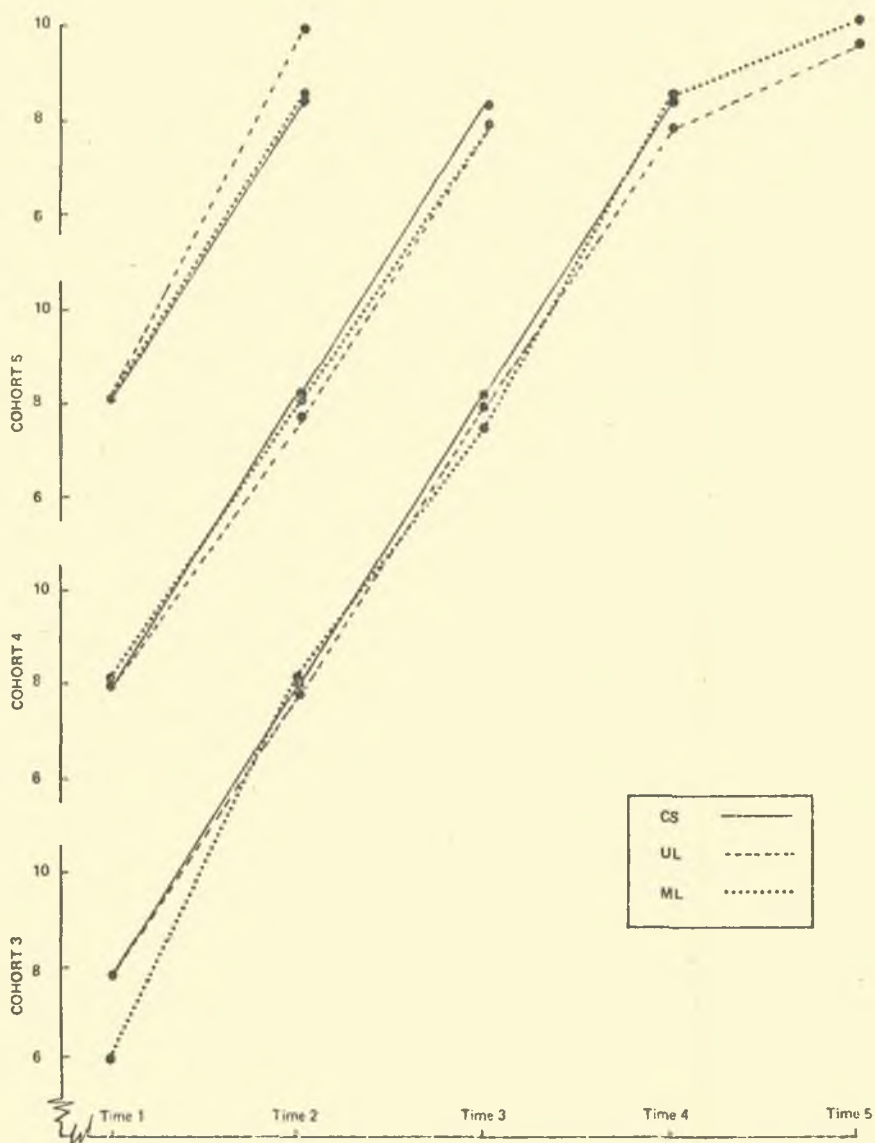AT EACH TIME OF TESTING

FIGURE 2

IRISH READING: DIFFERENCE BETWEEN HIGHEST AND LOWEST GROUP
MEAN FOR CROSS-SECTIONAL (CS), UNMATCHED LONGITUDINAL (UL)
AND MATCHED LONGITUDINAL (ML) DATA FOR EACH COHORT
AT EACH TIME OF TESTING

in Cohort 3 which has the greatest number of testing sessions and conse-
quently the smallest number of completely matched cases.

The apparent existence of this selection effect has unfortunate implic-
ations for the aims of the present study. It was hoped that the matched
longitudinal data would not be untypical of the other two data types, thus
permitting the investigation of the progressive reading gap hypothesis
on this data set alone. However, particularly for English reading in Cohort
3, the matched longitudinal data differ from the other two data types in a
manner which directly confounds the interpretation of a progressive
difference effect. This means that any evidence of a progressively widening
gap in reading attainment between social class groups is open to an inter-
pretation in terms of spurious selection effects.

Stage 2

In stage 1 of the analysis it was observed that a substantial gap exists
between the reading attainments of the three social-class groups at each
time of testing. The question to be considered in stage 2 is whether the
size of this gap at a given time is interpretable in terms of pre-existing group
differences or whether there has been a progressive widening of the gap
during the intervening time period. One way to look at this problem is
to use an analysis of covariance. With this method, differences between
groups on reading attainment at times 2, 3, 4 and 5 can be examined after
first adjusting for differences in reading attainment at time 1. If the adjusted
mean scores are significantly different, there is evidence of a progressive
reading gap between the groups.

For both Irish and English reading a separate covariance analysis was
carried out for each cohort at each standard. Thus for Cohort 3 there
were four analyses, with standard 3 at time 1 as the covariate, and standard
4 at time 2, standard 5 at time 3, standard 6 (autumn) at time 4, and
standard 6 (summer) at time 5, respectively as dependent variables. Similarly
for Cohort 4 there were two analyses, using standard 5 at time 2 and standard
6 at time 3 as dependent variables, and for Cohort 5 there was one analysis,
using standard 6 at time 2 as the dependent variable. The results of these
analyses are summarized in Table 4 for both English and Irish attainment.

For each analysis, the table shows the percentage of variance in the
dependent variable that is attributable to the covariate (reading attainment
at time 1), the independent variable (social-class group), and the inter-
action between them. In no case was the interaction between the covariate
and the independent variable significant, which implies that the regression
line of the dependent variable on the covariate has the same slope for each

TABLE 4

PERCENTAGE OF VARIANCE ACCOUNTED FOR COVARIATE (COV)
INDEPENDENT VARIABLE (IV) AND COVARIATE–INDEPENDENT VARIABLE
INTERACTION FOR ENGLISH AND IRISH READING ATTAINMENT

		Time of Testing			

English Reading

		Time 2	Time 3	Time 4	Time 5
Cohort 5	COV	62.44*	30.61*	46.16*	37.25*
	IV	0.28	0.35	3.31*	3.68*
	COV X IV	0.13	0.33	0.46	1.21
Cohort 4	COV	64.37*	60.60*		
	IV	0.23	1.66*		
	COV X IV	0.11	0.06		
Cohort 3	COV	65.65*			
	IV	0.39			
	COV X IV	0.20			

Irish Reading

		Time 2	Time 3	Time 4	Time 5
Cohort 5	COV	62.66*	25.30*	37.72*	35.81*
	IV	0.24	0.31	3.10*	4.96*
	COV X IV	0.37	0.30	0.11	0.27
Cohort 4	COV	62.44*	45.80*		
	IV	0.28	1.49		
	COV X IV	0.13	0.03		
Cohort 3	COV	26.68*			
	IV	0.25			
	COV X IV	0.59			

* Indicates a difference which is statistically significant at the .05 level.

social-class group.   When the independent variable is adjusted for the covariate, it reaches significance only in Cohort 3.   In the case of English reading, the effect is significant at time 3, time 4, and time 5, while for Irish reading the effect is significant at times 4 and 5 only.   It is worth noting that the percentage of variance in the dependent variable which is attributable to the adjusted independent variable increases as the time interval between covariate and dependent variable is extended.   In the analyses of both English and Irish reading, the effect is largest when reading attainment at time 5 is the dependent variable.   In this case the interval between covariate and dependent variable is 4½ years.

TABLE 5

SUMMARY OF SIGNIFICANT RESULTS FROM COHORT 3:
ADJUSTED SOCIAL-CLASS GROUP MEANS
EXPRESSED AS DEVIATIONS FROM THE GRAND MEAN

	Social Class Group	Irish Reading	English Reading
Time 5	1	2.83	2.58
	2	0.21	0.88
	3	−2.05	−2.38
	Range:	4.88	4.96
Time 4	1	1.70	2.21
	2	−0.62	0.38
	3	−0.69	−1.82
	Range:	2.39	4.03
Time 3	1	−	1.80
	2	−	0.34
	3	−	−1.48
	Range:	−	3.28

Table 5 shows the significant results in more detail.   For each analysis, the table shows the adjusted group mean, expressed as a deviation from the grand mean.   It can be seen from the table that the range of differences between highest and lowest group means increases with the length of time between testings.

DISCUSSION

This study has presented some evidence for a progressive gap in both English and Irish reading between social-class groups in Irish primary schools. The effects are not large. When the groups are statistically equated at one point in time, it takes at least a three-year period for the differences to re-emerge to a significant degree. In addition, a comparison of results from three types of data (cross-sectional, unmatched longitudinal, and matched longitudinal) implies that the observed differences may be due in part to a selection effect operating on the matched longitudinal data.

A comparison of the present results with the findings of the National Child Development Study in Britain may be of interest. In the British study, evidence of a progressive reading difference was found between social-class groups from the age of seven to the age of eleven (14). Over this four-year period the gap between the highest and lowest group increased from 1.4 to 3.0 years of reading age. In the present study a comparable time period is involved in analyses which examined differences in reading attainment at time 5, having adjusted for differences at time 1.

In my study, the gap in English reading attainment between lowest and highest groups increased from 5.1 standard score points at time 1 to 9.2 standard score points at time 5. For Irish reading, the gap increased from 5.6 points to 10.5 points. Since the Drumcondra Attainment Tests were standardized by grade rather than by age, there is no firm basis for converting standard score points to reading ages. However, a very rough estimate based on a regression analysis indicates that one standard score point is approximately equal to one month of reading age. If this approximation is accurate, we have, for a comparable time period, a gap of five to nine months of reading age in Ireland compared to a gap of 12 to 36 months of reading age in Britain. Even allowing for inaccuracies in the score conversion process, it does seem that the progressive reading gap is more extensive in Britain than in Ireland.

This difference may be partly due to differences in the sampling strategy employed in the studies. The British sample consisted of an age cohort (all children born in a particular week) whereas the Irish sample was a grade cohort — all children in a particular grade or standard in school at a particular time. The use of reading ages is probably more appropriate for an age sample than for a grade sample, since retention practices in schools can easily result in a negative correlation between age and reading ability at a given standard. For this reason, the Irish sample could be expected to show smaller social-class group differences than the British ones. Further,

the Irish sample excluded Protestant, private, and special schools, thereby restricting somewhat the range of social-class distribution.

In conclusion, this study succeeded in part in replicating British findings of a progressive reading gap between children from different social-class backgrounds, though it is of interest that the gap seems to be less pronounced in Ireland than in Britain. The nature of the mechanism by which the effect operates must obviously be of concern; its elucidation, however, must await further study.

REFERENCES

1. COLEMAN, J.S., CAMPBELL, E.Q., HOBSON, C.J., McPARTLAND, J., MOOD, A.M., WEINFIELD, F.D., & YORK, R.L. *Equality of educational opportunity.* Washington, DC: Office of Education, US Department of Health, Education, and Welfare, 1966.

2. COX, T. A follow-up study of reading attainment in a sample of eleven-year-old disadvantaged children. *Educational Studies,* 1979, *5,* 53-60.

3. DEUTSCH, M. AND ASSOCIATES. *The disadvantaged child.* New York: Basic Books, 1967.

4. DOUGLAS, J.W.B. *The home and the school. A study of ability and attainment in primary school.* London: MacGibbon & Kee, 1964.

5. DOUGLAS, J.W.B., ROSS, J.H., & SIMPSON, H.R. *All our future. A longitudinal study of secondary education.* London: Peter Davies, 1968.

6. EDUCATIONAL RESEARCH CENTRE. *Drumcondra English Test, Level II, Form A.* Dublin: Educational Research Centre, St Patrick's College, 1974.

7. EDUCATIONAL RESEARCH CENTRE. *Drumcondra English Test, Level II, Form B.* Dublin: Educational Research Centre, St Patrick's College, 1976.

8. EDUCATIONAL RESEARCH CENTRE. *Drumcondra English Test, Level III, Form A.* Dublin: Educational Research Centre, St Patrick's College, 1974.

9. EDUCATIONAL RESEARCH CENTRE. *Drumcondra English Test, Level III, Form B.* Dublin: Educational Research Centre, St Patrick's College, 1976.

10. EDUCATIONAL RESEARCH CENTRE. *Drumcondra Irish Test, Level II, Form A.* Dublin: Educational Research Centre, St Patrick's College, 1974.

11. EDUCATIONAL RESEARCH CENTRE. *Drumcondra Irish Test, Level II, Form B.* Dublin: Educational Research Centre, St Patrick's College, 1976.

12. EDUCATIONAL RESEARCH CENTRE. *Drumcondra Irish Test, Level III, Form A.* Dublin: Educational Research Centre, St Patrick's College, 1974.

13. EDUCATIONAL RESEARCH CENTRE. *Drumcondra Irish Test, Level III, Form B.* Dublin: Educational Research Centre, St Patrick's College, 1976.

14. FOGELMAN, K.R., & GOLDSTEIN, H. Social factors associated with changes in educational attainment between 7 and 11 years of age. *Educational Studies,* 1976, *2,* 95-109.

15. FOGELMAN, K.R., GOLDSTEIN, H., ESSEN, J., & GHODSIAN, M. Patterns of attainment. *Educational Studies,* 1978, *4,* 121-130.

16. HILTON, T.L., & PATRICK, C. Cross-sectional versus longitudinal data: An empirical comparison of mean differences in academic growth. *Journal of Educational Measurement,* 1970, *7,* 15-24.

17. JENSEN, A.R. Do schools cheat minority children? *Educational Research*, 1971, *14*(1), 3-28.

18. KELLAGHAN, T. *The evaluation of an intervention programme for disadvantaged children.* Slough: NFER Publishing Co., 1977.

19. KELLAGHAN, T., MADAUS, G.F., AIRASIAN, P.W., FONTES, P.J., & PEDULLA, J.J. *The effects of standardized testing.* Dublin: Educational Research Centre, St Patrick's College, and Chestnut Hill, Mass: Boston College, 1980.

20. KENNEDY, W.A. A follow-up normative study of negro intelligence and achievement. *Monographs of the Society for Research in Child Development*, 1969, *34* (2, Serial No. 126).

21. KENNEDY, W.A., VON DE RIET, V., & WHITE, J.C. A normative sample of intelligence and achievement of negro elementary school children in the southeastern United States. *Monographs of the Society for Research in Child Development*, 1963, *28*(6, Serial No. 90).