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PUPIL ACHIEVEMENT IN NORTHERN IRELAND PRIMARY SCHOOLS TWENTY-FIVE YEARS OF FINDINGS AND ISSUES

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Evidence available over a period of twenty five years on the comparative ability and attainment of pupils in Northern Ireland schools is reviewed A persistent finding was that of a high arithmetic—low English disparity peculiar to Northern Ireland pupils Two main reasons were advanced in explanation of this phenomenon poor home background and an undue emphasis in schools on practice in the mechanics of English at the expense of its use and comprehension These reasons are examined in the light of contemporary and more recent evidence

In 1945 Forbes (6) reported the results of an investigation which he claimed was the first instance of a number of teachers combining to conduct an educational research project in the schools of Northern Ireland The investigation began with a survey of the distribution of intelligence among pupils in the then Coleraine Regional Education Area All pupils aged ten to twelve in a representative sample of urban and rural schools in the area were tested on Moray House Test No 25 The mean IQ for the 640 pupils tested was 91 4 Some days later a sub-sample of 220 pupils was tested on Moray House Arithmetic and English Tests No 11 The sub-sample proved to be superior to the main sample on MH 25 the mean IQ being 96 8 The mean AQ was 110 5, and the mean EQ was 100 4 Forbes suggested that the increase in EQ over IQ was attributable to experience and practice on the intelligence test, resulting in the advantageous transfer of verbal skills to the English test

For a period of three weeks after the first testing on MH 25 a course of specialised teaching was given to pupils in the ten to twelve year age-range in seven schools This consisted of training in the ability to read and comprehend accurately and quickly a passage or a series of instructions and intensification of vocabulary and sentence study through the study of opposites, synonyms, analogies, classifi-

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cation, word selection and re-arrangement of sentences, and the confrontation of pupils with varied exercises based on new interests in order to establish confidence and discourage passive submission in the face of a novel situation A further five 'control' schools conducted school work in the normal manner At the end of the three-week period pupils in the 'trained' and 'control' schools were re-tested on Moray House Test No 26, a group test of intelligence similar to MH 25 The pre- and post-test mean IQs for the trained group were 92 9 and 99 8 respectively, showing a mean increase of 6 9 points of standardised score The pre and post test mean IQs for the control group were 88 3 and 92 6, showing a mean increase of 4 3 points Since both groups had equal opportunity to benefit from the practice and experience of the first test, Forbes concluded that the greater increase for the trained group could be considered as a teaching effect He did not overlook the fact that the trained group was initially higher on the intelligence scale He also noted that the pupils who benefitted most from teaching were those whose level of intelligence was just above average which in itself could have accounted for some of the trained group's superior increase

Forbes went on to argue that the poor performance of the main sample on the intelligence test should not be interpreted as due to innate mental inferiority He suggested that a poverty of interests because of isolated environment and a general weakness in language probably accounted for most of the observed deficit He instanced in particular the possible retarding effects in rural areas of the prevalent Scottish dialect and the poor cultural background of the homes He cited a report of the Northern Ireland Ministry of Education which had pointed out some years previously that English was practised in schools but not taught, whereas the teaching of arithmetic was not fraught with the same difficulties He drew attention to the fact that organised teaching, even over as brief a period as three weeks, seemed to stimulate performance on an intelligence test

The 1950 Report of the Ministry of Education for Northern Ireland (12) gave brief details of a comparison between work done in English, Scottish and Northern Ireland schools The comparison was based on the test results for some 7,000 eleven-year-old Northern Ireland pupils on Moray House Intelligence Test No 36, and Moray House English and Arithmetic Tests No 16 The report stated that the performance of Northern Ireland pupils was superior in arithmetic to that of the test

of English and Scottish pupils The performance of Northern Ireland pupils on the English test, though it compared favourably with their results on the intelligence test, was appreciably poorer By way of explanation the report pointed out that the Northern Ireland pupils were less test-sophisticated, at a greater disadvantage in vocabulary, and that the English test, having been standardised in Great Britain where teaching methods differed, had tested branches of work not normally emphasised in Northern Ireland schools On this last point the report stated

> An analysis of the attainment test in English revealed that far less emphasis was laid in the test on such formal branches of English study as spelling, grammar and the mechanics of composition than on vocabulary, comprehension and expression This suggested that the scope of English teaching had in the past been too narrowly conceived in our primary schools, and that more attention might profitably be given to enriching the children's vocabulary and range of ideas and to affording them more abundant opportunity to express themselves in speech and writing (12, p 22)

In 1953 some 800 pupils between the ages of ten and 12½ years who were attending a sample of primary schools in County Londonderry were tested on Moray House Intelligence Test No 47 and Moray House English and Arithmetic Tests No 22 The results, reported by Forbes (7), showed a clear superiority on arithmetic (mean AQ 101 3) as compared with English (mean EQ 95 0) and intelligence (mean IQ 96 9) A further break-down of the results by age-groups indicated that the high arithmetic—low English and intelligence disparity was most marked among ten-year-olds and least marked among twelve-year-olds

In 1963, Moray House Verbal Reasoning Test No 67 and Moray House English and Arithmetic Tests No 30 were given to 4,215 pupils out of an estimated population of 4,800 eleven to twelve-year-olds attending all primary schools in Co Antrim Table 1, which summarises the results for boys, girls and sexes combined, is taken from the unpublished report of the survey by Fee (5) Fee pointed out that the differences between boys' and girls' mean quotients were as expected He found that the distribution of quotients on both the Verbal Reasoning and English tests were positively skewed and platykurtic to a significant degree, whereas the distribution of Arithmetic quotients tended to be

TABLE 1

SUMMARY OF TEST RESULTS FOR ANTRIM 11-12 YEAR-OLDS (1963)

	MHVR 67		MH English 30		MH Arithmetic 30	
	Mean	SD	Mean	SD	Mean	SD
Boys	96 80	17 6	96 41	16 2	102 11	15 2
Girls	98 01	17 1	99 57	15 8	101 77	14 2
All pupils	97 38	17 2	97 82	16 0	101 95	14 5

negatively skewed and leptokurtic

Fee rejected the conclusion that the pupils tested were on average less intelligent than the standardisation samples Because the English and Verbal Reasoning tests were so highly correlated and similar in distribution characteristics he suggested instead that the intelligence of these pupils as a group was better reflected in the Arithmetic than the Verbal Reasoning scores, and that it was weakness in English which was causing the peculiarities in the distribution of Verbal Reasoning scores He added that it was probably nearer the mark to conclude that the departures from *normality* in Arithmetic were to some extent due to over-emphasis in the teaching of Arithmetic in primary schools, and that the departures from *normality* in Verbal Reasoning and English were due, not to any deficiency in innate intelligence, but to the verbally poor home environment of many pupils, and a lack of emphasis on English teaching in the broadest sense in primary schools

Fee's (5) suggestion that the Arithmetic test might be a better index of potential ability for Northern Ireland pupils than the group test of verbal reasoning was given some support by the findings of two investigations (14, 15) reported to the Northern Ireland Advisory Council for Education Both investigations were concerned with the predictive efficiency of the then Qualifying Examination, first introduced in 1948 as a means of selection for academic education in grammar schools The examination consisted of papers in English Composition, English Language and Arithmetic Candidates also took an intelligence test, the results of which were consulted only in the case of border-line candidates The first investigation (14, 23) consisted of a follow-up analysis of pupils qualified in 1948 in Country Antrim who entered grammar schools and subsequently sat for the Junior and Senior Certificate Examinations The single best predictor of subsequent performance in

both examinations was the Arithmetic Examination, closely followed by the intelligence test The least successful predictor was English Composition, though none of the differences in predictive efficiency between predictors was significant The report (14) drew attention to the unusualness of the findings, when compared with parallel research in Great Britain (23) It suggested that the greater emphasis on arithmetic in the primary schools of Northern Ireland might have changed the whole function of arithmetic as a predictor of grammar school success

The second investigation (15) consisted of a follow up of a random sample of all qualified pupils who entered grammar schools in 1950 The two best predictors of subsequent performance in the Junior Certificate Examination were the Arithmetic Examination and the intelligence test, in that order The two best predictors of performance at Ordinary level in the Senior Certificate Examination were the intelligence test and the Arithmetic Examination, in that order The report concluded that the best single predictor of later success was the intelligence test, though it also noted that Arithmetic might be a better predictor for boys, and that the intelligence test might be a better predictor for girls

McGilton (9) had earlier drawn attention to the observation that teachers with experience of children transferring from Northern Ireland to Great Britain, or in the opposite direction generally had found that Northern Ireland pupils were superior in the so-called mechanical aspects of the basic subjects whereas children from Great Britain were superior in the use and comprehension of language Northern Ireland teachers who had used tests of attainment standardised in England usually found that the pupils obtained higher scores than expected in spelling, punctuation and arithmetic, but lower than expected scores in reading and tests of comprehension McGilton also pointed out the limitations of an 'omnibus' test of English of the Moray House type, which gives no direct information about the several skills and abilities which are important in language study In his own study he compared the verbal abilities of two hundred Northern Ireland ten-year-olds with those of a similar number of English pupils The two groups were matched for age, socio economic background and type of school The test-battery comprised Speed of Handwriting, Spelling, Verbal Analogies, Non-Verbal Analogies, Verbal Classification, Non-Verbal Series Written Composition Reading Comprehension, Sentence Fluency,

Word Fluency, Problem Arithmetic and Mechanical Arithmetic

The teachers of the pupils taking part in the study were asked to complete a questionnaire on the teaching of language On the basis of their replies the teachers were placed on a 'traditional-progressive' continuum 'Traditional' was defined as favouring formal didactic methods, with emphasis on practice in the mechanics of language in a class situation 'Progressive' was defined as favouring the stimulation of pupils' powers to use and understand language by enriching their experience and arousing their interests through individual or group activities An analysis of the teachers' responses showed that the Northern Ireland teachers placed more emphasis than the English teachers on a formal analytic approach As a group the Northern Ireland pupils were superior to the English pupils on the mechanical aspects of language and arithmetic, but inferior on verbal tests of understanding and expression

When the test results were inter-correlated for each group and factor analysed by Burt's (2) group factor method, there was a greater degree of differentiation in the English factor pattern This was seen as supporting fairly conclusively the view that in a test battery consisting mainly of attainment tests informal, active or progressive methods appear to produce greater differentiation McGilton argued that in terms of 'sampling theory' (18) the English pupils would have had more 'sub pools' of ability available for 'est performance, resulting in a greater flexibility of approach to problem solving as suggested by Miller (11)

In the course of a study of the relationship between anxiety and attainment, Caldwell (3) re standardised seven Schonell group tests on 1,284 ten-year-olds in a representative sample of 55 schools in Antrim, Down and Belfast The tests comprised Silent Reading, Spelling, Mechanical Arithmetic Problem Arithmetic, English Usage, Vocabulary and Sentence Structure In order to see whether the attainments of the Northern Ireland pupils were still marked by the earlier inferiority to English pupils in vocabulary and the more creative uses of language, with a contrasting superiority in arithmetic and formal grammar the Northern Ireland norms were compared with the published norms for England (16) The comparison, as summarised by Caldwell and Seth (4), showed that the Northern Ireland pupils were scoring above the English norms on all but one test, Silent Reading On this test the two sets of norms were comparable for boys, but lower by some two points of score for girls On Mechanical Arithmetic the Northern

Ireland pupils were eleven points, or one year, ahead of the English norms The authors concluded that the centre of gravity in Northern Ireland primary schools would appear to have shifted upwards, but with the striking superiority in number work maintained They were careful, however, to point out that the Schonell norms for English children provided a doubtful baseline for comparison, having been obtained some twenty years previously

In 1970 the Northern Ireland Council for Educational Research conducted an investigation into the relationship between the educational progress of primary school pupils and their home, neighbourhood, and school environments (20) Over 2,000 pupils in each of two age-groups seven year-olds and ten-year olds, took part in the investigation These pupils were attending a probability sample of all Northern Ireland primary schools Both age-group samples were tested on group tests of ability, reading comprehension and mathematics In view of previous evidence that Northern Ireland pupils tended to be comparatively weaker on tests of verbal reasoning, the ten-year-olds were given tests of verbal and non-verbal ability All tests but one, the Moray House Picture Test for seven-year-olds, were re-standardised on the samples to a mean score of 100, and a standard deviation of 15

In Table 2 the raw-score equivalents of the re-standardised means at mean age of testing are shown in Column A The standardised score equivalents of these raw-scores on the published norms are shown in Column B The values in Column C are the actual raw-score means obtained by the samples The published norm equivalents in standard scores are shown in Column D Test discrepancies between the two sets of values are the result of re-standardisation 'smoothing' of the obtained raw-score distributions Since the pupil samples were based on a two-stage sampling procedure—first by schools and then by pupils—a better estimate of the corresponding population mean scores may be obtained by taking the mean of the school means for each test These are shown in Table 3, where they are converted by the same procedure as in Table 2 to equivalent standard scores on the published norms

The population estimates in Table 3 suggest that whereas Northern Ireland seven year-olds compare closely with English pupils of this age in reading comprehension and mathematics they are below English pupils in tested ability While the ten-year-olds are average in verbal ability, they are below average in non verbal ability, reading compre-

TABLE 2

TEST DETAILS NICER SURVEY (1970)

Sample ages at testing		Test	A Raw-score equivalent of re-standardised test mean	B Equivalent of A on published norms	C Sample raw-score mean	D Equivalent of C on published norms
Mean	Range					
7 3	6 9– 7 9	Moray House Picture Test 2	Not re-standardised	[95 0]	—	[95 0]
7 3	6 9– 7 9	Reading Test N S 45 (NFER)	11 0	99 0	12 7	101 0
7 3	6 9– 7 9	Mathematics Test A1 (NFER)	12 5	100 0	13 0	101 0
10 3	9 9–10 9	Non-Verbal Test 5 (NFER)	55 5	93 5	53 5	92 5
10 3	9 9–10 9	Primary Verbal Test 2 (NFER)	38 5	100 0	39 6	101 0
10 3	9 9–10 9	Primary Reading Test 2 (NFER)	23 0	95 0	23 2	95 0
10 3	9 9–10 9	Mathematics Test C3 (NFER)	22 0	95 0	22 8	95 0

TABLE 3

BY SCHOOL POPULATION ESTIMATES NICER SURVEY (1970)

Test	A Mean of school means	B Raw-score equivalent	C Equivalent of B on published norms
7 year-olds			
Moray House Picture Test	96 2	Not restandardised	[96 2]
Reading N S 45	102 6	13 0	101 0
Mathematics A1	102 3	14 0	103 0
10 year-olds			
Non-verbal 5	100 5	56 0	94 0
Verbal Test 2	100 5	39 0	100 0
Primary Reading 2	99 2	22 5	94 5
Mathematics C3	100 3	22 0	95 0

hension and mathematics In view of the previous evidence of the poorer performance of Northern Ireland pupils on tests of verbal reasoning, the verbal—non verbal disparity in favour of the verbal test is surprising Equally surprising, in view of previous findings, is the lack of any evidence of a reading comprehension—mathematics disparity in favour of the latter at either age level

This was the first study to provide firm evidence on the ability-attainment pattern of Northern Ireland seven-year-olds However, there is evidence from a study by Booth (1) which is of interest at this point As part of an evaluation of a remedial reading intervention programme, Booth carried out a longitudinal survey of reading in County Antrim A random sample of over 600 seven-year olds, fully representative of this age population in all County Antrim schools, was tested in 1967 on the Neale Analysis of Reading Ability for reading accuracy, comprehension and speed These pupils were re-tested at yearly intervals over the four year period, 1967-1970 At initial testing in 1967 the sample was on average above the Neale age-norms on all three aspects of oral reading Three years later, in 1970, the sample was reading on average at or below the age norms for accuracy and comprehension, depending on sex of pupil and type of school Girls, for example, remained superior to boys in reading accuracy throughout, though boys in 'county' schools had caught up with girls in reading comprehension

in the final year of testing This pattern of comparatively higher initial progress and a later slowing down in the accuracy and comprehension aspects of oral reading is consistent with the findings of the Northern Ireland Council for Educational Research study The cross-sectional evidence from the latter suggests a similar attainment decline in reading comprehension from ages seven to ten

A Northern Ireland Council for Educational Research survey of reading comprehension among Northern Ireland eleven and fifteen-year-olds in 1972 is of particular comparative interest (22) The survey was designed in such a way as to make possible fairly precise comparisons between the reading comprehension levels of Northern Ireland pupils and those of their age counterparts in England in 1970-71, as reported by Start and Wells (17) This survey showed that at age eleven the reading comprehension of Northern Ireland pupils on the NS6 test was below that of English pupils by about two months of reading age The difference was not significant, and the survey findings revealed that it could be accounted for largely in terms of a greater incidence of reading backwardness among Northern Ireland boys than among English boys For instance 14 per cent of Northern Ireland eleven-year-old boys were found to be reading below an estimated seven-year old level, as against nine per cent of English boys The corresponding percentages for Northern Ireland and English girls were seven and eight

CONCLUSION

The consistency of the research evidence from the mid-1940s to the early 1960s led those familiar with the findings to postulate a high arithmetic—low English disparity peculiar to Northern Ireland pupils Further evidence indicated that pupil superiority was more marked in mechanical than in problem arithmetic (3), and more marked in the mechanical aspects of language, such as spelling and grammatical accuracy than in its use and comprehension (9)

Two main reasons were advanced in explanation of these findings Firstly it was suggested that the homes of many Northern Ireland pupils particularly those in rural areas, were culturally and verbally impoverished Secondly attention was drawn to an undue emphasis in schools on the mechanics of English at the expense of its use and comprehension A corollary of these views led to the assumption that the poorer performance of Northern Ireland pupils on group tests of

verbal intelligence was not indicative so much of intellectual poverty as of a greater disadvantage in the use and understanding of language (5, 6)

A subsequent investigation of the relationship between environment and primary education confirmed that in a complex pattern of interrelationships the home appeared to be a stronger determinant of educational progress than the school (20) The one exception to this general finding was for seven-year-old girls, among whom the school was the stronger determinant of superior performance on a test of mathematics The study did not reveal whether Northern Ireland homes were more, or less, deficient in their quality of verbal-educational stimulation than are homes elsewhere Nor did the findings suggest that pupils in small, and therefore largely rural, schools were at a greater educational disadvantage when the social, familial, and economic characteristics of the pupils' homes were taken into account

This last proviso is clearly important in any comparison of urban-rural differences A number of studies have shown that rural pupils perform less well than urban pupils on group tests (3, 4, 6, 7, 21) and individually administered tests of vocabulary and word recognition (21) The question reduces to whether rural pupils are educationally disadvantaged by reason of rural isolation *per se*, or whether the disadvantage is largely, if not wholly, explicable in socio-economic terms Forbes (6) for example, found that the farmers' children who attended urban schools had much higher IQs than those attending rural schools He also noted, however, that the former came as a rule from the more prosperous holdings

Only one study offered direct evidence in support of the suggestion that the methods of teaching and classroom objectives of teachers in Northern Ireland were more formal and didactic than those of their counterparts in England That was in the mid-1950s (12) In the early 1960s, when Caldwell attempted to place her sample of Northern Ireland teachers on a 'traditional-progressive' continuum on the basis of their professed teaching styles, the sample clustered towards the progressive end (3, 4)

In the late 1960s a survey among teachers m the lower primary school revealed further indications of a change of views and practice (19) In number work two out of every three teachers professed to having changed their teaching over the previous two years in the direction of a greater emphasis on practical work, as being more relevant to the needs

of their pupils The majority of these teachers favoured continuing developments in 'new mathematics' along the lines of the Nuffield Mathematics Project in primary schools

These findings helped to determine the choice of mathematics tests for seven and ten-year-olds in a further investigation (20) The tests were chosen on the basis that they were of recent origin, and that the contents were designed to test understanding rather than skill in computation—which may be one explanation of why the study showed no evidence of a high mathematics—low reading comprehension disparity for either age-group In the regression analysis there was some slight evidence of a positive relationship between an observed school preference for discovery methods and mathematical topics, as against formal text-book practice, and the ability of ten-year old boys to score highly on the mathematics test

With one exception (9) the studies reviewed have based their comparative findings on the performance of Northern Ireland pupils on tests constructed and standardised in Great Britain The criterion of comparison has been the average level of performance, or norm, of the standardisation samples When comparisons are made on the basis of test norms three questions arise Firstly, are the test norms of recent origin? Secondly, how adequately was the test standardised? Thirdly, if the test is a test of attainment, how adequately does it sample the educational experience of the pupils?

There is evidence that group tests may become easier with time because of increasing test-taking expertise or a real rise in standards (8) One result of this has been the distinction between *criterion*-referenced and *norm*-referenced standards on, say, a test of reading (17) Pillıner Sutherland and Taylor (13) have shown that performance on Moray House Verbal Reasoning Tests had improved over a ten-year period to the extent that six points of IQ had to be added to the IQs obtained on the later tests in order to make them comparable with those obtained on the earlier tests Pillıner and his colleagues attributed this 'zero error' effect to increased test sophistication Macnamara (10), who found a similar but less marked 'zero error' effect with Moray House English Tests, has suggested that both increased test sophistication and a real improvement in standards of reading comprehension may be contributory

It may also be too easily assumed that a test has been adequately standardised on a 'good' national sample in its country of

origin To illustrate that this is not necessarily always so, the standardisation credentials of a battery of tests used in a study carried out by the Northern Ireland Council for Educational Research (20) are pre-

TABLE 4

REPORTED TEST STANDARDISATIONS

Test	When standardised	Standardisation Sample(s)
MH Picture Test	1955–56	Based on eight L E A s
Reading Test N S 45	1960	Based on a national survey (England)
Mathematics A1	1969–71	6 764 children in five selected areas
Non-verbal 5	1964–65	Two L E A s in England
Primary Verbal 2	1959	A representative sample in a selected area in England
Primary Reading 2	1969	Four area samples in England
Mathematics C3	1965	Provisional norms based on nine Greater London Boroughs

sented in Table 4 The reported test standardisations in this table span a period of fifteen years Only one test Reading Test NS45, has norms based on a representative national sample The norms for Moray House Picture Test 2, Mathematics A1 Primary Verbal 2 Non-Verbal Test 5 and Primary Reading 2 are based on area samples which at best might be *judged* to be nationally representative One can only conclude that for most of these tests the reported norms are unsatisfactory as a basis for making national comparisons

It is also difficult to see how other than when the test is designed to sample a narrowly specified set of skills as in reading comprehension or arithmetical computation, a 'borrowed' attainment test of the omnibus variety can do adequate justice to the curriculum Such a test may embody a representative sampling of the common contents and objectives of the curriculum of the parent population It can hardly pretend to sample as adequately the contents and objectives of a curriculum in a differing pupil population Even in ostensibly similar school systems teaching content and objectives may vary in the subtlest of ways

One thing in particular which the Northern Ireland findings from the 1940s to the 1960s suggested was that within ostensibly comparable school systems, with apparently common or at least largely overlapping

objectives, the relative order of importance, or weights, attached to these objectives was the distinguishing feature The problem of distinguishing and specifying these relative weights, both in terms of pupil achievement and teaching behaviour, is similar in many ways to that encountered in the evaluation of curriculum change It is one which though recognised, has for the most part been less than adequately investigated in the comparative evaluation of pupil achievement in these islands

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