The Irish Journal of Education, 1972, vi, 2, pp 133-143

THE SCHOLASTIC PERFORMANCE OF CHILDREN IN A DISADVANTAGED AREA*

THOMAS KELLAGHAN AND DEIRDRE BRUGHA

Educational Research Centre
St Patrick's College, Dublin

The performance of a group of 8- and 9-year old children (n 60) living in a disadvantaged inner-city area was examined on a series of measures of cognitive ability and scholastic performance Comparable data were obtained for a sample of children of similar age (n 60) selected as being representative of children living in 'non disadvantaged' areas in the same city The poorer performance of children in the disadvantaged area was most obvious on tests with a high verbal content The scholastic attainment of children in the disadvantaged area varied significantly according to school attended

Interest in the poor scholastic performance of a section of the population that has come to be known as disadvantaged grew in the 1960s A child is regarded as 'disadvantaged' if, because of social or cultural characteristics (e g , social class or poverty), he comes into the school system with knowledge, skills and attitudes which make adjustment difficult and impede learning (23) The personal characteristics of such children have been the focus of research in other countries, particularly in the United States (13, 23) Ideally, any attempts at prevention or remediation of the learning problems of disadvantaged children should be based on a clear understanding of their characteristics

To date, in Ireland, only a few studies of such children have been carried out with some exceptions these have tended to support findings in other countries In one Irish study, for example it was found that children who had been living in a disadvantaged area, on entering preschool at the age of three, scored below standardization norms on tests of intelligence, vocabulary, and preschool readiness (18) The retardation on measures of verbal ability was not as great as had been reported in most American studies however, the mean IQ on the Stanford-Binet reported in this study was 93 0 (SD 13 1) Retardation

*This study was supported by funds from the Department of Education of the Irish Government and the Van Leer Foundation

of older children has been more marked In a series of studies in a school in a disadvantaged area in Dublin, a mean IQ of 83 3 (SD 13 5) was reported for performance on the Wechsler Intelligence Scale for Children (20), while the mean Arithmetic Quotient on the Vernon Graded Arithmetic Test was 75 4 (SD 13 1) and the mean English Quotient on the Marino Word Recognition Test, 73 0 (SD 17 9) (11)

The present study was carried out to examine further the personal characteristics of children living in a disadvantaged area It differed from previous Irish studies in a number of respects The subjects of the investigation were eight years of age, by which age major developmental trends have already been well established (4) Further, since Irish norms are not available for most objective tests, a small but representative sample of children attending school in the greater Dublin area was selected for the present study and comparative data obtained for it Finally, the range of variables investigated differed from those in previous studies

Five major areas were investigated intelligence, language, perceptual development, cognitive style and scholastic attainment The Stanford-Binet Scale was used as a measure of general intelligence since there is evidence that it provides a good measure of basic cognitive skills, for this reason it has been used in several studies of the disadvantaged (e g , 2, 18, 19, 29) However, it has been argued that it may be too verbal for disadvantaged children For this reason a second measure of intelligence was used, a test which had been designed to reduce the effects on test performance of such background factors as language, social status and culture A test of vocabulary development was also included in the test battery, though performance on such a test obviously is highly sensitive to background influences, nevertheless, such a test was included, since language ability obviously plays a major part in mental development A measure of perceptual development which has been found to be related to such skills as writing and reading (17, 28) was also used As a measure of another kind of cognitive activity, a test of cognitive style was included Children with similar or closely approximating IQ scores may produce very different cognitive products It has been argued that the way one processes information is a function of the aspect of a visual field which one selects for labelling as well as the degree of reflection or impulsivity with which one classifies these events or objects Kagan, Moss and Sigel (14) have shown that production of analytical responses are associated with a more reflec-

tive approach to cognitive tasks Analytical responses are often called for in the work of the school Available evidence that lower class children compared to middle class ones tend to hyperkinesis, motoricity and impulsiveness (13, 16, 26) led to the inclusion of a measure of reflectiveness in the present study Finally, a number of conventional objective tests of school attainment were administered

METHOD

Sample

Disadvantaged The population was made up of all children aged between 8 years 2 months and 9 years 4 months living in a clearly defined geographical area in the centre of Dublin The area was chosen because of its high level of educational failure, the general economic deprivation of families and the poor levels of housing and employment in the area It was ascertained that children in the area attended either a local school or one of a number of schools immediately outside the area which will be referred to as 'neighbouring' schools Of 180 children in the required age group in the area, 79 attended the local school and 101 attended one of seven neighbouring schools A sample of 60 of these (30 boys and 30 girls) was selected for the study The proportion of children from each school chosen for the sample reflected the proportion of the target population attending the school Twenty-seven children were selected from the local school and 33 from the neighbouring schools The mean age of the children in the sample was 8 years 9 months (SD 5 4 months)

Control

A further group of children, a so-called 'normal' group was selected from children attending schools in the greater Dublin area The procedure followed in the selection of this group was that recommended by Burt (7) This method attempts to identify children of median ability or attainment on the assumption that the scores of such children should approximate the mean of a larger sample of children randomly chosen For the present study, schools' inspectors were asked to rate schools in their areas in Dublin city and county according to the level of attainment of the pupils Fifteen median or 'average' schools were thus selected It was assumed that eight-year old children of average ability should be found in classes in which the majority of pupils were eight years of age Where classes were streamed, pupils were selected

from the middle stream or from two streams combined Teachers were then asked to rank pupils aged between 8 years 5 months and 9 years 1 month for attainment in the selected classes From those ranked in intermediate positions, 60 pupils (30 boys and 30 girls) were selected randomly The average number of children selected from each school was 4 13 The mean age of the group was 8 years 7 months (SD 2 37 months)

Measures

Intelligence The Stanford-Binet Intelligence Scale (Form L-M) is a conventional test of general intelligence which provides a deviation IQ score (27) The Cattell Culture Fair Intelligence Test, Scale 1, is a test of general mental ability, made up of a series of perceptual tasks, a ratio IQ based on chronological and mental ages can be calculated (9)

Language On the English Picture Vocabulary Test, a British version of the American Peabody Picture Vocabulary Test (5), for each of 40 items, the subject is asked to match one of four pictures with a word called out by the tester Standardized scores incorporating age adjustments are provided

Perceptual development The Developmental Test of Visual Motor Integration is a measure of the extent to which visual perception and motor behaviour are integrated The test consists of 24 geometric forms to be copied with paper and pencil A reproduction must meet certain criteria to be scored correct The total number of correct responses gives the raw score age equivalent scores are provided (1)

Cognitive style In the Matching Familiar Figures Test, the subject is presented with pictures of familiar objects (the standard) and asked to choose from six variants the one that is identical to the standard Delay or latency, as well as correct responses and errors, is recorded (15)

Attainment (i) The Marino Graded Word Reading Scale is designed to measure the ability to pronounce correctly English words presented in printed form (22) reading ages, based on Irish norms are yielded by the scale (ii) Scala Gradaithe sa Gaeilge (Léamh) is designed to measure ability to pronounce correctly Irish words presented in printed form, reading ages can be calculated The test was developed at the Educational Research Centre, St Patrick's College, Dublin (iii) The Schonell Mechanical Arithmetic Test, Form B is a group test of mechanical arithmetic skills (25) arithmetic ages can be calculated

RESULTS

The means and standard deviations for the control and both disadvantaged groups on all ten measures are set out in Table 1 Similar figures are given for the combined disadvantaged groups In the case of each variable a t-test was carried out to determine the significance of the difference between the scores of the combmed disadvantaged group and those of the control group The degrees of freedom varied from test to test, this was because adjustments were made to deal with the inequality of variances when such existed (21) In most cases, the number of degrees of freedom was close to 120, in one case the number fell as low as 103 Table 1 gives the t-values obtained for each measure

When the disadvantaged were treated as two groups (those attending local and those attending neighbouring schools), and comparisons were made between these groups and with the control group, analyses of variance were carried out The F values which emerged from these analyses are also presented in Table 1 The number of degrees of freedom for the analyses was 2, 119

A glance at Table 1 will indicate that the disadvantaged group as a unit performed significantly less well than the control group on all measures Most of the differences are highly significant

All F-values, with one exception (the cognitive style Matching Familiar Figures latency scores) are also significant, seven of them beyond the 001 level Scheffé post hoc comparisons revealed the source of the significance found in the analyses (24) Each variable will be considered in turn in each case the 01 level was set for rejection of the null hypothesis of no difference between groups

(i) Stanford Binet Intelligence Scale The means of the two disadvantaged groups do not differ significantly, both disadvantaged means differ significantly from that of the control group

(ii) Cattell Culture Fair Intelligence Test The only significant difference is between the mean of the disadvantaged group attending local schools and the mean of the control grup

(iii) English Picture Vocabulary Test The disadvantaged groups do not differ from each other, both differ from the control groups

(iv) Developmental Test of Visual Motor Integration The difference between disadvantaged groups is not significant, but both these groups differ from the control group

(v) Matching Familiar Figures latency score The F-value in the

TABLE 1

MEANS AND STANDARD DEVIATIONS ON TEN MEASURES FOR CONTROL AND DISADVANTAGED GROUPS

Measure		Control (N 60)	Disadvantaged			t	F
			Local (N 27)	Neighbouring (N 33)	Total (N 60)		
Stanford- Binet IQ	M	105 24	79 70	88 03	84 28	8 50***	
	SD	16 06	15 8	16 00	16 06		41 02**
Cattell Culture Fair IQ	M	107 03	97 00	101 70	99 58	2 97**	
	SD	12 40	16 82	13 46	15 12		5 33**
English Picture Vocabulary	M	84 53	71 48	74 42	73 10	6 33***	
	SD	8 35	11 73	10 97	11 31		20 96***
Visual Motor Integration	M	96 68	78 22	82 03	80 32	5 42***	
	SD	18 46	11 62	16 83	14 73		14 94***
Matching Fgures Latency	M	15 21	10 44	13 33	12 03	2 60*	
	SD	7 27	3 93	7 38	6 20		4 78
Matching Figures Incorrect responses	M	11 81	16 63	12 91	14 58	2 47*	
	SD	6 18	5 43	6 39	6 21		5 96**
Matching Figures Correct responses	M	5 56	3 44	5 06	4 33	2 90**	
	SD	2 44	1 53	2 50	2 25		8 12***
Marino Reading Quotient	M	104 20	71 43	85 70	79 30	8 22***	
	SD	15 65	11 57	19 44	17 77		92 61***
Irish Reading Quotient	M	104 58	78 23	88 23	83 94	10 26***	
	SD	10 53	9 39	10 30	11 04		64 53***
Mechanical Arithmetic Quotient	M	96 61	86 41	93 20	90 14	3 99***	
	SD	8 85	7 13	10 14	9 46		13 07***

*Significant at 02 level **Significant at 01 level ***Significant at 001 level

analysis of variance is not significant Hence it is concluded the groups do not differ from each other

(vi) Matching Familiar Figures number of incorrect responses The only significant inter-group difference is that between disadvantaged children attending their local school and the control group

(vii) Matching Familiar Figures number of correct responses As in

the previous case, the only significant intergroup difference is between 'local' disadvantaged children and control children

(viii) Marino Graded Word Reading Test Differences between all pairs of groups are significant

(ix) Irish Graded Word Reading Test Differences between all pairs of groups are significant

(x) Schonell Mechanical Arithmetic Test Only the local disadvantaged group and the control group differ significantly from each other

DISCUSSION

As in previous studies of children living in disadvantaged areas, the present study reveals that such children perform less well than children living in better-off areas on a variety of psychological and scholastic tests Patterns of differences however are not uniform for all tests On one set of measures, the two disadvantaged groups do not differ among themselves but differ from the control group This set is made up mainly of highly verbal measures the Stanford-Binet Intelligence Scale and the vocabulary test The visual-motor integration task, a measure of the integration of perceptual and motor behaviour and which does not appear to have a large verbal content, also falls into this category This test, on face value, would appear to have a good deal in common with tests like the Cattell Culture Fair Intelligence Test and the Matching Familiar Figures Test The disadvantaged children attending neighbouring schools perform relatively better on these latter tests than on more highly verbal ones, their performance being intermediate between that of the control and other disadvantaged groups, but not differing significantly from either Performance on the mechanical arithmetic test, which again involves relatively non-verbal skills, shows a similar pattern In general, there is a more striking dissimilarity in performance between disadvantaged and control children on tests requiring verbal skills than on less verbally loaded tests In this, our findings support statements which have noted the verbal deficiencies (as measured by tests at any rate) of disadvantaged children elsewhere (2, 3, 10 19 29) The poor performance of disadvantaged children on these tests suggests the presence in their environment of factors unfavourable to the development and use of verbal skills as assessed by conventional tests

The performance of the disadvantaged group on the Cattell Culture Fair Intelligence Test, while inferior to that of the control group,

equalled the performance of the American standardization sample,* again suggesting that children in disadvantaged environments are less handicapped on relatively non-verbal tasks than on verbal ones This finding may also be taken as evidence that the Culture Fair Test is less susceptible to variations in the background of testees than are tests of verbal intelligence

It is also of interest to note that the disadvantaged subjects in the present study were not significantly more impulsive in their approach to problem solving than were the control group children This finding runs counter to statements based both on impressionistic and some empirical evidence that disadvantaged children are less reflective than are middle-class children However, there is also evidence that a marked change in functioning of children of low socio economic status takes place at about the age of eight years when their performance, relative to that of middle-class children, improves (16) The fact that the subjects of our investigation were eight years old may account for the lack of a difference in cognitive style between middle-class children and disadvantaged groups

The results which divide the groups most strikingly are those obtained on the tests of reading attainment The pattern is the same for both English and Irish reading the control group performs significantly better than the disadvantaged group attending neighbouring schools, which in turn performs significantly better than the disadvantaged group attending the local school The standard of attainment of the disadvantaged groups bears out the often noted association between a disadvantaged background and school failure When Burt's (8) suggested quotient of less than 85 as a criterion of backwardness is applied, 70 per cent of the disadvantaged groups can be classified as backward as against 11 per cent of the control group Considering the two disadvantaged groups separately 96 per cent of those attending their local school are backward compared to 48 per cent of those going to neighbouring schools The situation is not quite so bad in the case of Irish reading Fifty five per cent of the disadvantaged group have quotients of less than 85 as against two per cent of the control group

*The test results indicate that the control group in the present study was slightly above average on a number of measures The variations in standardized scores obtained by this group on such tests as the Cattell Culture Fair Intelligence Scale and the English Vocabulary Test indicate the difficulty in using normative data derived from other populations

(Obviously the control group has a somewhat better standard of Irish than the population on whom the test was standardized) Again considering the two disadvantaged groups separately, 71 per cent of the pupils attending their local school can be classified as backward as against 44 per cent of the pupils in the neighbouring schools

Differences between groups are not as marked in the case of attainment in mechanical arithmetic as in the case of reading, a finding that agrees with other reports on the attainments of disadvantaged children However the amount of backwardness is still relatively extensive Again using a quotient of less than 85 as a criterion, 36 per cent of the disadvantaged groups can be described as backward, while only six per cent of the control group can be so described Among disadvantaged children attending their local school the figure for backwardness is 44 per cent as compared with 30 per cent for disadvantaged children attending neighbouring schools Considering that the control group scored some three points below the British norms on the tests of mechanical arithmetic, a restandardization of the test with Irish norms might result in the reduction of the above estimates of backwardness among the disadvantaged groups

An interesting aspect of these findings is that while pupils living in the disadvantaged area who attend their local school and pupils living in the same area who go to neighbouring schools do not differ significantly in intelligence (Stanford Binet and Cattell Culture Fair tests) or in the level of their vocabulary (as measured by the Picture Vocabulary Test), they differ significantly in attainment in English and Irish reading The reasons for these differences in attainment cannot be deduced from the present study They could be due to differences in the two sets of school attended or they could be related to home factors (e g , parental attitudes, aspirations and expectations) which led to the selection of different schools in the first place There is, in fact, some evidence that the homes of the two groups differed (6), but how precisely these differences are related to attainment is not clear

Finally, a comparison may be made between the findings of the present study and other studies which have been carried out in the same area Before making this comparison, one must enter two reservations Firstly, the same tests were not used in all the studies, two used the Stanford-Binet Scale while the third employed the Wechsler Intelligence Scale for Children Secondly, the studies report findings from different samples of children, not from the same children tested

at different age levels Given these qualifications, the comparisons seem justified at least as an indicator of a general trend The comparison between the performance on conventional intelligence tests of children of different age levels in the area reveals a decline in IQ with age A mean IQ of 93 for three-year olds in the area (18) had decreased to one of around 80 for eight-year olds and over (20) Most of the decline seems to have taken place by about the age of eight Reading attainment measures are relevant only in the case of the two studies which were concerned with older children—the present one and one carried out by Chamberlain (11) The mean reading quotient for disadvantaged eight-year olds (in the present study) was found to be 79 30 while that for children aged nine to thirteen was reported as 73 0 These figures, and in particular when the scores of three-year old children are taken into account, provide some support for the so-called cumulative deficit phenomenon, i e , 'that deprivational influences have a greater influence at later developmental stages than at earlier ones (12 p 305) '

It is clear that the disadvantaged area from which the subjects of the present investigation were drawn presents many educational problems It is also clear that there is considerable variation in abilities and attainment within the area The fact that children of similar intellectual ability, given different home backgrounds and/or different educational environments reach different levels of scholastic attainment points strongly to the possibility that suitable intervention procedures could raise the level of school performance of children in the area Furthermore the evidence that a cumulative deficit phenomenon seems to be operating suggests that early rather than later intervention is likely to be more successful

REFERENCES

1 BEERY, K E *Developmental test of visual-motor integration Administration and scoring manual* Chicago Follett Educational Corporation, 1967

2 BEREITER, C , and ENGLEMANN, S *Teaching disadvantaged children in the preschool* New York Prentice Hall, 1966

3 BERNSTEIN, B Language and social class *British Journal of Sociology* 1960, *11*, 271-276

4 BLOOM, B S *Stability and change in human characteristics* New York Wiley, 1964

5 BRIMER, M A , and DUNN, L M *Manual for the English Picture Vocabulary Tests* Bristol Educational Evaluation Enterprises, 1962

6 BRUGHA, D A comparative study of disadvantaged and non disadvantaged eight-year old children in Dublin Cognitive, scholastic and environmental characteristics Unpublished M Psych Sc thesis, University College, Dublin, 1971

7 BURT, C *Mental and scholastic tests* London King, 1921

8 BURT, C *The backward child* London University of London Press, 1937

9 CATTELL, R B *Culture fair (or free) intelligence test Scale 1 Handbook for the individual or group* Champaign, Illinois Institute for Personality and Ability Testing, 1950

10 CAZDEN, C Subcultural differences in child language An interdisciplinary review *Merrill-Palmer Quarterly of Behaviour and Development* 1966, *12*, 185-220

11 CHAMBERLAIN, J Attainment and disadvantage A study of the relationship between school attainment and disadvantage in a Dublin inner-city subculture Unpublished M Psych, Sc thesis, University College, Dublin, 1970

12 DEUTSCH, M , and BROWN, B R Social differences in negro white intelligence differences In Deutsch, M and associates, *The disadvantaged child* New York Basic Books, 1967 Pp 295-307

13 GORDON, J E The disadvantaged pupil *Irish Journal of Education* 1968, *2*, 69-106

14 KAGAN, J , MOSS, H , and SIGEL, I Psychological significance of styles of conceptualization *Monographs of the Society for Research in Child Development* 1963, *28*, (2, Serial No 86)

15 KAGAN, J , ROSMAN, B , DAY, D , ALBERT, J , and PHILLIPS, W Information-processing in the child Significance of analytic and reflective attitudes *Psychological Monographs General and Applied* 1964, *78*, (1, whole No 578)

16 KAPLAN, J L , and MANDEL, S Class differences in the effects of impulsivity, goal orientation and verbal expression on an object sorting task *Child Development*, 1969, *40*, 491-502

17 KATZ, P A , and DEUTSCH, M The relationship of auditory and visual functioning to reading achievement in disadvantaged children In Deutsch M and associates *The disadvantaged child* New York Basic Books, 1967 Pp 233-258

18 KELLAGHAN, T A preschool project in a disadvantaged area in Dublin Paper presented at Seminar on Early Childhood Education in the Caribbean Kingston, Jamaica, 4-9 October, 1971

19 KLAUS, R A , and GRAY, S W The early training project for disadvantaged children A report after five years *Monographs of the Society for Research in Child Development* 1968, *33*, (4, Serial No 120)

20 McGEE, P Intelligence and disadvantage A study of the levels of school children's intelligence and the relationship between intelligence and home environment in a disadvantaged area in Dublin Unpublished M Psych, Sc thesis, University College, Dublin, 1970

21 OSTLE, B *Statistics in research* Iowa Iowa State College Press, 1954

22 Ó SUILLEABHAIN, S V *Marino graded word reading scale* Dublin Longmans, Browne and Nolan, 1970

23 PASSOW, A H (Ed), *Deprivation and disadvantage Nature and manifestations* Hamburg UNESCO Institute for Education, 1970

24 SCHEFFÉ, H *The analysis of variance* New York Wiley, 1959

25 SCHONELL, F J , and SCHONELL, F E *Diagnostic and attainment testing* Edinburgh Oliver and Boyd, 1960

26 SCHWEBEL, A L Effects of impulsivity on performance of verbal tasks in middle and lower class children *American Journal of Orthopsychiatry* 1966, *36*, 12-21

27 TERMAN, L M , and MERRILL, M A *Stanford-Binet Intelligence Scale Manual for the third revision Form L-M* London Harrap, 1961

28 VERNON, M D *Backwardness in reading* Cambridge Cambridge University Press, 1958

29 WEIKART, D P (Ed) *Preschool intervention A preliminary report of the Perry Preschool Project* Ann Arbor Michigan Campus Publishers 1967