RESEARCH INTO SEASON OF BIRTH AND SCHOOL ACHIEVEMENT

A Select Annotated Bibliography

Compiled by Caroline Sharp
and Pauline Benefield

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RESEARCH INTO SEASON OF BIRTH AND SCHOOL ACHIEVEMENT:

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INTRODUCTION

We decided to prepare this annotated bibliography in response to the growing interest in the educational impact of season of birth effects. This area became the subject of considerable debate in the 1960s, when it was noticed that higher proportions of children born in the autumn months (September to December) were passing the 11-plus assessments and gaining places at academically-oriented grammar schools. It was also discovered that there were higher proportions of children born in the summer (May to August) receiving education in special schools. The issue has resurfaced in the 1990s, with the new emphasis on national levels of attainment.

We have selected key pieces of published research in this area, giving priority to recent research and to studies that are frequently cited by other researchers. The bibliography is divided into five main sections containing studies on the following issues.

1. **Academic attainment (UK studies, LEA and school studies, international studies)**
2. **School attendance**
3. **Sporting achievement**
4. **Referral for special educational needs (UK, international studies)**
5. **School entry policies.**

The intention is to provide evidence on the nature and prevalence of season of birth effects, and to illuminate their most likely causes. The studies are listed chronologically within each section.

1.1 ACADEMIC ATTAINMENT – UK STUDIES

FOGELMAN, K. and GORBACH, P. (1978). 'Age of starting school and attainment at eleven', *Educational Research*, **21**, 1, 65-7.

A report using data from the National Child Development Study which comprised a sample of 10,300 children all born within one week in March 1958. This sample was divided into two groups: those who started their infant schooling early (between the ages of four years six months and four years 11 months), and those who started late (between five years and five years six months). The authors examined the association between age of starting school and measures of behaviour and attainment administered at age 11. The results found that the 'early starters' performed better than the 'late starters' on all three tests of academic ability. As the pupils were all the same age, this study suggests that the differences found are due to length of schooling.

RUSSELL, R.J.H. and STARTUP, M.J. (1986). 'Month of birth and academic achievement', *Personality and Individual Differences*, 7, 6, 839-46.

The authors of this article reviewed a body of research carried out since the 1960s into the relationship between season of birth and achievement. They conclude that autumn-born children tend to perform better than spring-born children and spring-born children, in turn, out-perform summer-borns. The effect was evident for both primary and secondary stages of schooling.

The researchers studied the degree results of nearly 300,000 students graduating from British universities between 1972 and 1982. After adjusting for fluctuations in the monthly birthrate, they found that a significantly higher proportion of autumn-born students graduated from university. However, summer-born students obtained a better class of degree.

MORTIMORE, P., SAMMONS, P., STOLL, L., LEWIS, D. and ECOB, R. (1988). *School Matters: the Junior Years*. Wells: Open Books.

The relationship between season of birth and teachers' assessments of pupils' ability was examined in this study of 2,000 children attending 50 junior schools in inner London. Teachers' ratings of their pupils' level of ability significantly favoured those born in the autumn. The analyses suggested that teachers were influenced in their assessments primarily by children's reading, writing and mathematics attainment, and did not take full account of the impact of age differences on attainment within year-based classes.

Analyses of the three Verbal Reasoning ability bands to which the children were allocated at the end of junior schooling indicated that a higher than expected proportion of those born in the summer were allocated to the lowest band, thus disadvantaging them when they transferred to secondary schools.

BELL, J.F. and DANIELS, S. (1990). 'Are summer-born children disadvantaged? The birthdate effect in education', *Oxford Review of Education*, **16**, 1, 67-80.

Summer-born children scored lower than autumn-born children on Assessment of Performance (APU) science tests at age 11, 13 and 15. The authors draw comparisons with studies conducted in other countries to support the view that it is the age position of the pupil within the class that is the main explanatory factor for this performance difference. The authors urge teachers to consider these artificial performance differences when grouping pupils according to ability for national assessment levels.

FOXMAN, D., RUDDOCK, G. and McCALLUM, I. (1990). *APU Mathematics Monitoring 1984-88 (Phase 2): a Summary of Findings, Conclusions and Implications* (Assessment Matters No. 3). London: SEAC, EMU and COI.

Surveys of pupils' mathematics performance carried out by the Assessment of Performance Unit (APU) in 1978 and 1982 found a season of birth effect in the results obtained by both 11- and 15-year-olds. The differences in results indicated that autumn-born children were about six percentage points ahead of summer-borns at age 11, and three points ahead at age 15. The authors calculated that the effect of these differences in maths attainment meant that: 'The summer-born 11-year-old could be about one year behind their peers born in the autumn.'

SHORROCKS, D. (1993). *Testing and Assessing 6 and 7 Year Olds. The Evaluation of the 1992 Key Stage 1 National Curriculum Assessment, Final Report.* London: NUT.

An evaluation of key stage 1 (KS1) results from 89 schools in 52 English and Welsh local education authorities (LEAs). The report includes an analysis of the results by season of birth, concluding that: 'At all levels, subject, PC and AT, winter-born children outperformed spring-born children, who in turn outperformed the summer-born.' The authors considered whether length of schooling could cause such differences: further analyses revealed a season of birth effect even when account was taken of the length of time the children had spent in school.

SHARP, C., HUTCHISON, D. and WHETTON, C. (1994). 'How do season of birth and length of schooling affect children's attainment at key stage 1?', *Educational Research*, **36**, 2, 107-21.

A study of the 1991 National Curriculum results obtained by a national random sample of around 4,000 six- and seven-year-olds from 310 schools in 73 English and Welsh LEAs. Significant age-related differences were found, with summer-borns performing least well in maths, science, and English. Although boys performed significantly less well than girls in English and maths, there was no interaction between gender and season of birth effects.

Among the spring- and autumn-born children, those who had longer at school performed better. Summer-borns did not show this pattern, suggesting that the advantage of having longer in school may be counterbalanced by negative effects from being younger on entry to school (e.g. through exposure to conditions and curriculum not tailored to meet the needs of young four-year-olds). The authors conclude that age-related differences at key stage 1 will not be eliminated by adopting a pattern of annual entry to school.

SHARP, C. (forthcoming). 'What's age got to do with it? A study of patterns of school entry and the impact of season of birth on school attainment', *Educational Research*, **37**, 3.

This study collected information from 102 (85 per cent) LEAs in England and Wales in 1995. The predominant school entry policy in 44 per cent of LEAs was to admit the whole year group in the September of the year they became five. Termly admission policies were the main or only policy in 25 per cent and 23 per cent had two entry points (September and January). Recent policy changes in 32 authorities reflected a concern to help summer-born children by giving them longer in school.

Analyses of KS1 data provided by seven LEAs showed a season of birth effect, which appeared to be unrelated to length of schooling. Thirteen LEAs provided GCSE results for each month of birth, all of which showed a downward trend in results from oldest to youngest in the age-group, although some anomalies were apparent in the month-on-month trends. Two authorities provided evidence that summer-borns were more likely to be identified as in need of extra support on entry to school, and less likely to enter for A-level.

The author argues that season of birth effects are to be expected at KS1 because these results do not make allowances for age differences. This, coupled with the fact that teachers may compare summer-borns unfavourably with older children in the same class, could help explain the persistence of season of birth effects to age 16. The article ends with a number of strategies which could be adopted by local authorities and schools seeking to redress disadvantages suffered by the youngest in the year group.

1.2 ACADEMIC ATTAINMENT – LEA AND SCHOOL STUDIES

DORSET EDUCATION AUTHORITY (1991). *National Curriculum Assessment, Key Stage 1, 1991: Final Evaluation Report.* Dorchester: Dorset County Inspectorate.

The Dorset Inspectorate found evidence of a season of birth effect when looking at the effect of age upon pupils' performance within the LEA. The percentage of pupils achieving level 3 at key stage 1 who were born in September and October of 1983 was significantly higher than for those born in the following July and August. This finding was consistent for maths, English and science.

HEDGER, K. (1992). '"Seen it; been there; done it": the analysis of GCSE examination results in Shropshire', *Management in Education*, **6**, 1, 29-33.

Research carried out by Shropshire LEA in collaboration with Sheffield University found that summer-born children did less well in school assessments. The effect was particularly marked at KS1, but was also apparent at GCSE. A month-by-month analysis of 1991 maths and English GCSE results showed that students with September to November birthdates did best, and those with July and August birthdates had the poorest results.

WIGAN EDUCATION AUTHORITY (1992). *An Analysis of the 1992 Key Stage 1 Results.* Wigan: Wigan Metropolitan Borough Council, Department of Education.

WIGAN EDUCATION AUTHORITY (1993). *1993 GCSE Results in Wigan.* Wigan: Wigan Metropolitan Borough Council, Department of Education.

These reports contain analyses of pupils' performance by month of birth. At KS1, there was a clear relationship between age and average aggregated results for English, maths, science and technology. At GCSE level, there was more variation in the pattern of scores from month to month, but older students still performed better (a difference between the youngest and oldest students equivalent to three grades for every nine subjects taken).

GILES, R. (1993). 'The effect of date of birth on performance within the secondary school', *School Science Review*, **75**, 270, 133-5.

This research, carried out in an individual school, found no season of birth effects for English, maths or science performance at GCSE, but autumn-borns scored higher in science and maths assessments at key stage 3 (i.e. at age 14).

MacALEER, J. (1993). *National Curriculum Key Stage 1 1993: Analysis of Results.* London: Royal Borough of Kensington and Chelsea Education Department, Research and Information Unit.

This study found that one of the factors affecting pupils' KS1 results at Borough level was their month of birth: 'The youngest pupils in the cohort achieved at significantly lower levels ... in all nationally reported areas.' Factors found to affect attainment at the school level included term (season) of birth. Number of terms of primary education and number of terms in current school did not contribute to the variance in results once other factors (e.g. season of birth) were taken into account.

McGECHIE, A. and BENTON, T. (1994). *The Young Ones: the Persistence of Under-performance among the Summer-born.* London: Barking and Dagenham Education Department, Policy and Planning Unit.

A number of different measures were used to examine the effects of season of birth on school attainment in this LEA. The results showed that summer-borns (defined as children with April to August birthdates) tended to perform significantly less well on almost all measures, including: a school entry screening assessment (*Bury Infant Check*), reading tests for pupils in Years 2 and 6, GCSE (attainment of five or more A to C grades), proportions entering for A-level, and performance at A-level.

1.3 ACADEMIC ATTAINMENT – INTERNATIONAL STUDIES

See also:
Section 4.2
BERGLUND (1967).

DAVIS, B.G., TRIMBLE, C.S. and VINCENT, D.R. (1980). 'Does age of entrance affect school achievement?', *The Elementary School Journal*, **80**, 3, 133-43.

The results from nearly 54,000 Kentucky students were examined for differences in attainment between those who had entered first grade at age five and those who had entered a year later (aged six). There were three cohorts: first-, fourth- and eighth-grade students, all of whom took standardised tests in language, reading, maths and basic skills. The results showed a significant advantage at first- and fourth-grade levels for those who had been six on entry to school. At eighth-grade level, only one result (reading) favoured six-year-old entrants, and this may have been more influenced by sex effects than by age on entry to school.

LANGER, P., KALK, J.M. and SEARLS, D.T. (1984). 'Age of admission and trends in achievement: a comparison of blacks and Caucasians', *American Educational Research Journal*, **21**, 1, 61-78.

A national study of student performance in the US, comprising some 97,000 Caucasian and 17,000 black students. Three cohorts were studied: nine-, 13- and 17-year-olds. Assessment data in reading, mathematics and science were analysed in relation to age-position. Among Caucasians, the oldest students had significantly higher achievement at age nine; age differences remained significant but decreased at age 13, and disappeared at age 17. For black students, there were significant age-related differences for the nine- and 13-year-old cohorts. An analysis of students who were required to repeat a grade revealed that a significantly higher proportion of grade repeaters were students younger in their year group. This was the case for both black and Caucasian students.

DIETZ, C. and WILSON, B.J. (1985). 'Beginning school age and academic achievement', *Psychology in the Schools*, **22**, 1, 93-4.

The school records of 117 pupils from one US school district who had started school in the school year 1978-79 were examined. The children's assessment records were analysed for three groups (mean ages: five years one month, five years six months and five years 11 months). Measures used were: kindergarten readiness; a standardised achievement test; a group ability test; and retention in grade. There were no age-related differences found at kindergarten, second or fourth grade. There were some significant differences between scores obtained by boys and girls but no interactions between sex and age.

KINARD, E.M. and REINHERZ, H. (1986). 'Birthdate effects on school performance and adjustment: a longitudinal study', *Journal of Educational Research*, **79**, 6, 366-72.

This research studied the effects of school entrance age on school performance and adjustment to school in one US school system. The researchers divided a sample of 777 kindergarten entrants into six groups, each representing two months of the year. The oldest children scored highest in tests of cognitive ability, but there were no age-related differences in parents' and teachers' assessments of the pupils' adjustment to school. The researchers argue that it is the child's skill in processing information which is the main determinant of cognitive attainment at entry and later in the child's school career. They suggest that schools should take age and cognitive ability into account when judging a child's readiness to be admitted to school.

MAY, D.C. and WELCH, E. (1986). 'Screening for school readiness; the influence of birthdate and sex', *Psychology in the Schools*, **23**, 1, 100-5.

A study of 152 children, representing all the students in grades three to six in one US school district for whom complete test data were available. The sample was divided into four, three-month groups, the oldest of whom had December to February birthdates. The scores on a kindergarten screening test differed according to age, with the oldest students achieving the highest scores. These differences diminished over time: the youngest group appeared to be 'catching

up' between kindergarten entrance and second grade. An achievement test battery administered in grades two and four did not reveal any significant age-related differences. There were some sex differences but no interaction was found between age and sex effects. The authors conclude that birthdate effects can be limited to the early years of school, provided that schools are able to meet the individual needs of children.

SHEPARD, L.A. and SMITH, M.L. (1986). 'Synthesis of research on school readiness and kindergarten retention', *Educational Leadership*, **44**, 3, 78-86.

A summary of school readiness and retention research, citing 52 references (mainly from the USA). The authors suggest that, although significant age differences are found, the gap between oldest and youngest students is small (around seven per cent in first grade) and most studies show that the disadvantage of being the youngest disappears by the third grade. However, there is evidence that younger children are more likely to be referred for special needs provision or to repeat a year, and this can have negative consequences for children's self-concept and attitudes to school. The authors do not support changes to the school entry age, 'school readiness' assessment, or giving 'unready' children an extra year in school before first grade.

UPHOFF, J.K. and GILMORE, J. (1986). 'Pupil age at school entrance - how many are ready for success?', *Young Children*, **41**, 2, 11-16.

A review of research in the USA on the academic performance of early entrants, noting that the older children in a grade tend to receive many more above-average assessments from teachers than do younger children in the grade. Older children are also more likely to score in the above-average range on standardised achievement tests. The younger children in a grade are more likely to have been referred by teachers for learning disabilities testing than are older students. The authors conclude that damaging consequences for children who are not developmentally mature at school entrance may continue throughout their school careers and sometimes even into adulthood. Several possible ways to reduce the magnitude of the 'unready' child's problem are suggested.

CROSSER, S.L. (1991). 'Summer birth date children: kindergarten entrance age and academic achievement', *Journal of Educational Research*, **84**, 3, 140-6.

Results from a US study of 45 matched pairs of children showed that summer-borns who entered kindergarten at age six did significantly better in tests of academic achievement (administered in fifth or sixth grade) than those who had entered kindergarten at age five.

COSDEN, M., ZIMMER, J. and TUSS, P. (1993). 'The impact of age, sex, and ethnicity on kindergarten entry and retention decisions', *Educational Evaluation and Policy Analysis*, **15**, 2, 209-22.

The focus of this study was the impact on Anglo and Latino children of kindergarten retention policies in three US school districts. It was found that approximately ten per cent of children had been 'held back' from starting kindergarten by their parents, and these tended to be the youngest in the age group.

BORG, M.G. and FALZON, J.M. (1995). 'Birth date and sex effects on the scholastic attainment of primary schoolchildren: a cross-sectional study', *British Educational Research Journal*, **21**, 1, 61-74.

This study of birthdate effects in Malta looked at the results of over 4,000 primary school children in 1991. Three age cohorts were studied, each being divided into four three-month groups for the purposes of analysis. The oldest pupils in each cohort (January to March birthdates) performed significantly better in tests of English, Maltese, and maths than the youngest (October to December birthdates). Girls performed significantly better than boys, but there were no interactions between the effects of age and sex. The authors suggest that selection processes adopted by schools (such as streaming by ability) should make allowances for the influences of age.

2. SCHOOL ATTENDANCE

CARROLL, H.C.M. (1992). 'Season of birth and school attendance', *British Journal of Educational Psychology*, **62**, 3, 391-6.

A study of school attendance patterns within one Welsh LEA. In a sample of more than 5,000 pupils in their last year of primary education, a significantly greater proportion of pupils with poorer attendance rates were born in the summer months. The author rules out the influence of length of schooling, because the authority admitted all children at the start of the year in which they became five. It is suggested that teachers' responses to younger pupils within the year group may make school a less enjoyable experience, and therefore lead to a poorer attendance record among summer-borns.

3. SPORTING ACHIEVEMENT

DUDINK, A. (1994). 'Birth date and sporting success', *Nature*, **368**, 14 April, 592.

Having found an association between season of birth and professional tennis and soccer players in The Netherlands, this researcher conducted a study of the birthdates of professional football players in England. In 1991-2, significantly more of the English league club footballers were born between September and November (almost twice as many as those with June to August birthdates). The author suggests that this is a consequence of summer-born children being youngest in the school year group.

4.1 REFERRAL FOR SPECIAL EDUCATIONAL NEEDS – UK STUDIES

PUMFREY, P.D. (1975). 'Season of birth, special educational treatment and selection procedures within an LEA', *Research in Education*, **14**, 55-76.

An analysis of the birthdates of children attending 23 special schools in one LEA. Significantly more summer- than autumn-borns were found to be attending these schools. The author suggests that screening procedures should make adequate allowances for age-related differences in attainment.

PUMFREY, P.D. and WARD, J. (1991). 'Term of birth and special education placement: the impact of assessment procedures in an LEA', *Research in Education*, **46**, 61-71.

Information was collected from 14 special schools in one LEA. Analyses of the birthdates of the pupils (aged from four to 17-plus) revealed no relationship between special school provision and term of birth. The authors suggest that the LEA may have acted to reduce the effects of age-related selection bias in response to the findings of previous research and/or to the provisions of the 1981 Education Act.

BIBBY, P., LAMB, S., LEYDEN, G. and WOOD, D. (forthcoming). *Season of Birth and Gender Effects in Children Attending Moderate Learning Difficulty Schools* (Technical Report No. 24). Nottingham: University of Nottingham, ESRC Centre for Research in Development, Instruction and Training (to be published as an article in the *British Journal of Educational Psychology*).

This study focused on the academic attainment and cognitive ability of pupils from two schools for children with moderate learning difficulties (MLD). The researchers assessed 71 pupils aged from 11 to 15 on tests of: intelligence; maths; reading; and communication skills. The results showed that the boys and summer-borns attending these MLD schools had significantly higher scores than other pupils (there was no interaction between gender and season of birth effects). The authors suggest that there may be a selection bias operating in teachers' referrals of children for special provision, which discriminates against boys and summer-borns.

4.2 REFERRAL FOR SPECIAL EDUCATIONAL NEEDS – INTERNATIONAL STUDIES

See also:

Section 1.3
LANGER, KALK and SEARLS (1984);
DIETZ and WILSON (1985);
MAY and WELCH (1986);
UPHOFF and GILMORE (1986).

BERGLUND, G.W. (1967). 'A note on intelligence and season of birth', *British Journal of Psychology*, **58**, 1 and 2, 147-51.

This Swedish research was carried out on a sample of 708 children in mainstream classes and 237 children with learning difficulties. In the first sample, no significant difference in intelligence was obtained between groups of children born during different parts of the year. In the sample of children with learning difficulties, the mean IQ was observed to be highest in the group born from August to November. The author rejects the argument that differences in intelligence between groups of children born during different parts of the year are due to climatic factors.

DiPASQUALE, G.W., MOULE, A.D. and FLEWELLING, R.W. (1980). 'The birthdate effect', *Journal of Learning Disabilities*, **13**, 5, 4-8.

Referrals received by members of the schools psychological services in Ontario, Canada were studied in relation to birthdate. Once referrals for gifted programmes were eliminated, the sample consisted of 390 boys and 162 girls. Results were analysed in relation to the pupils' birthdates, which were divided into six two-month blocks (the oldest children in the year group were those born in January and February). Referrals were found to increase significantly for later birthdates (i.e. for children younger in the year group). Further analyses revealed that the effect was confined to the primary grades (kindergarten to grade three); to referrals for academic, rather than behavioural difficulties; and to boys.

TARNOWSKI, K.J., DRABMAN, R.S., ANDERSON, D.F. and KELLY, P.A. (1990). 'Disproportionate referrals for child academic/behaviour problems: replication and extension', *Journal of Consulting and Clinical Psychology*, **58**, 2, 240-3.

A study of over 200 US children referred to school psychology services for help with academic problems associated with: learning disability; attention deficit-hyperactivity; behaviour problems; or immaturity. It was found that approximately twice as many boys as girls were referred for help, and there were significantly more referrals for the youngest within the year group (July to September birthdates). The authors conclude that teachers may be influenced by non-academic, developmental differences (such as size, athletic ability, social skills) when referring children for psychological intervention.

DeMEIS, J. and STEARNS, E. (1992). 'Relationship of school entrance age to academic and social performance', *Journal of Educational Research*, **86**, 1, 20-7.

These researchers studied the birthdates of nearly 700 students (aged five to 18) referred for special needs assessment or placed in special programmes in one US school district. The study included students referred for 'gifted' programmes as well as those with academic or social/behavioural difficulties.

The results indicated that students who were older in the year group were referred significantly more often by teachers for 'gifted' evaluation; younger students were more often referred for help with social/behavioural difficulties and there were significantly more younger children placed in pre-first grade classes (designed to help children whom teachers felt had failed to master the kindergarten curriculum). There were no significant relationships between age and referrals for academic difficulties, placement in a special 'mental health' programme or placement in a programme for gifted students. The authors suggest that entrance age is not a major contributor to student failure, but developmental factors should be considered by teachers before referring students for help.

5. SCHOOL ENTRY POLICIES

See also:

Section 1.1
SHARP (forthcoming).

CLEAVE, S., BARKER LUNN, J. and SHARP, C. (1985). 'Local education authority policy on admission to infant/first school', *Educational Research*, **27**, 1, 40-3.

The authors discuss the findings of a questionnaire survey on policy of admission to infant (or first) school, which was sent to all LEAs in autumn 1983. There were indications of an increasing trend towards admitting more children under statutory age to infant school, and, in particular, to admitting them annually.

WOODHEAD, M. (1986). 'When should children go to school?', *Primary Education Review*, **25**, 10-13.

Trends in the admission of children to primary school at the age of four show that annual entry has become more popular. This article discusses the implications for nursery and pre-school education, and looks at practice in other European countries.

SHARP, C. (1988). 'Starting school at four', *Research Papers in Education*, **3**, 1, 64-90.

The subject of this paper is the early admission of children to school in England and Wales. Data provided by 90 local education authorities in 1986 showed that annual entry at the beginning of the school year of the child's fifth birthday was the most common mode of entry to school, followed by termly admission. Biannual entry (e.g. in September and January) was less common, being practised by fewer than one in five LEAs.

WEST, A. and VARLAAM, A. (1990). 'Does it matter when children start school?', *Educational Research*, **32**, 3, 210-17.

This article examines the effects of age of entry to infant school from several different angles. First of all policies about age of entry to school in England and other countries are explored, followed by a selective review of the literature. The third section focuses on the effects of pre-school education, and the fourth section looks at the quality of learning experiences in nursery and infant classes.

DANIELS, S. (forthcoming). 'Trends in the early admission of children to school: appropriate or expedient?', *Educational Research*, **37**, 3.

This research gathered information on school entry policies from 102 English and Welsh LEAs. The survey took place in July 1993. Results indicated that a majority of LEAs had a policy which was followed by all primary/infant/first schools. Very few LEAs had a policy of admission at statutory age. The two most popular policies, each adopted by about a third of authorities, were to admit children at the beginning of the term of their fifth birthday or to admit the whole year group in September. The author identified an increasing trend towards admission from four, but found that LEAs were not necessarily ensuring 'nursery conditions' for four-year-olds in infant classes.

RELATED BIBLIOGRAPHIES

The NFER holds the following related bibliographies:

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Research into Season of Birth and School Achievement

This annotated bibliography is a response to the growing interest in the educational impact of children's season of birth. This subject was the focus of much debate in the 1960s when it was noticed that higher proportions of children born in the autumn months (September to December) were passing the 11-plus assessments and gaining places at academically oriented grammar schools, whereas higher proportions of children born in summer (May to August) were being educated in special schools.

This issue has resurfaced in the 1990s, the new context being national levels of attainment. The purpose of this bibliography is to provide evidence on the nature and prevalence of season of birth effects, and to shed light on their most likely causes.

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