

PHOTO REDACTED DUE TO THIRD PARTY RIGHTS OR OTHER LEGAL ISSUES



Gender and education: the evidence on pupils in England

department for
education and skills

Creating Opportunity
Releasing Potential
Achieving Excellence

Contents

1	Overview	1
2	Key Findings	2
2.1	Attainment through the Education System	2
2.2	GCSE Attainment	2
2.3	GCSE Subject Choice	3
2.4	A-Level Entries and Subject Choice	3
2.5	A-Level Attainment	3
2.6	Foundation Stage and Key Stage 1-3 Results	3
2.7	International Evidence	4
2.8	Gender, Social Class and Ethnicity	4
2.9	Assessing the Gender Gap	5
2.10	Cognitive Differences	5
2.11	Pre-School Differences	5
2.12	Gender and Special Educational Needs	6
2.13	Gender and Behaviour	6
2.14	Reasons for the Gender Gap	7
2.15	Raising Attainment	7
2.16	Single Sex Education	8
2.17	School Workforce	8
3	Public Examinations at the End of Compulsory Schooling	9
3.1	Introduction	9
3.2	Key Findings	9
3.3	Number of Entries	12
3.4	Subject Choices	12
3.5	O-Level/GCSE Attainment	17
3.6	Gender Differences at GCSE at A* grade and G Grade	32
4	Public Examinations at Age 18	34
4.1	Introduction	34
4.2	Key Findings	34
4.3	Post-16 Participation Rates	34
4.4	Historical A-Level Attainment in English and Maths	39
4.5	A-Level Attainment across Subjects	41
4.6	Attainment at Grade A and Grade E	44
5	National Curriculum Assessments	48
5.1	Introduction	48
5.2	Key Findings	48
5.3	Foundation Stage Profile	48
5.4	Gender Gap across Key Stages and A-Level	50
5.5	Attainment at the Extremes	54
5.6	Pupil Progression	55

6	Gender, Social class and Ethnicity: Relative Impact and Interactions	57
6.1	Introduction	57
6.2	Key Findings	57
6.3	Relative Effects of Social Class, Ethnicity and Gender	58
6.4	Ethnicity, Gender and Social Class Interactions	61
6.5	The Interaction of Individual, School and Neighbourhood Level Deprivation	69
7	Has the Gender Gap Increased?	72
7.1	Introduction	72
7.2	Key Findings	72
8	Is the Gender Gap in Attainment Important?	75
8.1	Introduction	75
8.2	Key Findings	75
8.3	Underachieving Groups	75
8.4	Equality in the Labour Market	79
9	Pre-School Differences	80
9.1	Introduction	80
9.2	Key Findings	80
9.3	How Early Are Differences Observed?	80
9.4	Differences at Pre-School	81
10	Cognitive Differences	82
10.1	Introduction	82
10.2	Key Findings	82
10.3	Gender Differences in IQ Tests	82
11	International Evidence	84
11.1	Introduction	84
11.2	Key Findings	84
11.3	Background to PISA	85
11.4	Maths	85
11.5	Reading	86
11.6	Science	87
11.7	Problem Solving	88
12	Special Educational Needs	89
12.1	Introduction	89
12.2	Key Findings	89
12.3	Gender Differences in Identification of Special Educational Needs (SEN)	89
12.4	Is There a Gender Bias in Identification of SEN?	91
12.5	Interaction with Social Class and Ethnicity	91
13	Behaviour and Disaffection	93
13.1	Introduction	93
13.2	Key Findings	93
13.3	Exclusions	94
13.4	Attendance	98
13.5	Bullying	99
13.6	Youth Offending	100

14	Why is There a Gender Gap?	101
14.1	Introduction	101
14.2	Key Findings	101
14.3	Are Gender Differences Attributable to Early Development?	102
14.4	Do Boys and Girls Have Different Learning Styles?	102
14.5	What is the Impact of Learning Style on Attainment Outcomes?	104
14.6	Does Type of School Make a Difference?	105
14.7	How Does Teacher-Pupil Interaction Impact on the Gender Gap?	106
14.8	Aspects of Masculine Identity Can Be Seen as Incompatible with Academic Success	106
14.9	Do Parents Have Different Educational Expectations of Their Sons Compared to their Daughters?	107
14.10	How Does Social Class and Other Aspects of Pupil Identity Interact with Gender?	107
14.11	Does Teaching Practice Affect the Gender Gap?	107
14.12	Are Changes in the Examination System Responsible for the Gender Gap?	108
15	Strategies for Raising the Attainment of Boys	112
15.1	Introduction	112
15.2	Key Findings	112
15.3	Pedagogic Approaches	113
15.4	Individual Approaches	113
15.5	Socio-Cultural Approaches	114
15.6	Whole School Organisational Approaches – Single Sex Classrooms	114
15.7	Role Models	116
16	Single Sex Education	118
16.1	Introduction	118
16.2	Key Findings	118
16.3	Background	118
16.4	Impact on Attainment	119
16.5	Impact on Subject Choice	120
17	School Workforce	121
17.1	Introduction	121
17.2	Key Findings	121
17.3	Nursery/Primary School	121
17.4	Secondary School	123
17.5	Headteachers	123
18	Table of Figures	125

1 Overview

This topic paper draws together a range of evidence on gender and education.

It summarises current statistics on the participation and attainment of boys and girls from the Reception Year to the Sixth Form, placing the findings in an historical context where this is possible. Performance data from international research complement the historical data and strengthen the conclusions on overall trends. Subject choice and attainment are the main foci of the paper but gender differences in areas such as special educational needs, school exclusions, attendance and bullying are also covered.

A large number of research papers have been written on the gender gap in attainment and this topic paper refers to a selection of these. We ask why there are differences in boys' and girls' participation and achievement and examine what strategies are effective in tackling boys' lower attainment levels.

The paper focuses primarily on gender differences of school-aged pupils. In order to understand gender differences for this age group, it is important to draw on the literature on early childhood, biological and cognitive differences. However, it is beyond the scope of this paper to examine this in any detail. Equally what happens at school then determines higher education and career choices but this is not covered here.

An important objective of this paper is to put the gender debate in context by examining the extent of the gender gap and discussing the role of gender in education alongside the role of other pupil characteristics, particularly social class and ethnicity. In addition, the focus is not solely on the concepts of the "gender gap" and "boys' underachievement" but also acknowledges that, on the one hand, many boys are high attainers and, on the other, that many girls face significant challenges.

2 Key Findings

2.1 Attainment through the Education System

- Converging evidence from a variety of sources (historical exam records for England, Foundation Stage and Key Stage results, international evidence and current results) show that the gender gap is wide in English and narrower in Maths, with, on average, girls performing better than boys. The gender gap in the Sciences has been traditionally very small.

2.2 GCSE Attainment

There has been a long-standing gender gap at GCSE for those attaining 5+ A*-C:

- Since 1988, on the threshold measure of 5+ A-C GCSEs, a significant gender gap in favour of girls has emerged. This gap quickly increased and subsequently became stable at around a 10 percentage points difference, with little variation since 1995. The gender gap is currently 9.6 percentage points: 63.4 percent of girls and 53.8 percent of boys achieved 5+ A*-C GCSEs or equivalent in 2006.

Girls tend to do better in the majority of GCSE subjects:

- The largest gender differences (a female advantage of more than ten percentage points on those gaining an A*-C GCSE) are for the Humanities, the Arts and Languages. Smaller gender differences (a female advantage of five percentage points or less) tend to be in Science and Maths subjects.
- Some of these achievement patterns have been relatively stable over six decades of exam results, particularly in English Language and Literature, French, Art and Design and Religious Studies.
- There have been changing patterns over the years. In Maths, there has been a shift from a male advantage averaging 4 percentage points prior to 1991 to a slim female advantage of 1-2 percentage points in recent years. In Geography, there has been a widening of the gap in girls' favour, and in History, there has been fluctuation but with girls now doing much better than boys.
- Attainment at each end of the distribution of grades also varies by gender. Girls are more likely than boys to gain an A* grade at GCSE. Boys are a little more likely to gain a G grade at GCSE or to gain no GCSEs at all.

2.3 GCSE Subject Choice

There are important gender differences in subject choices:

- Taking the 10 most popular GCSE choices, 9 out of 10 subjects are chosen by both boys and girls. Nonetheless, many subjects show gender stereotypical biases with girls more likely to take arts, languages and humanities and boys more likely to take Geography, Physical Education and IT.

2.4 A-Level Entries and Subject Choice

Post-16 participation rates vary by gender:

- Girls are more likely to stay on in full time education at age 16 (82 percent of girls and 72 percent of boys). Girls are also more likely to be entered for A-Levels than boys (54 percent of entries are female), in contrast to the 1950s and 1960s when only a third of A-Level entries were female.

Gender differences in subject choice become more accentuated post-16:

- Gender differences in subject choice are greater at A-Level than at GCSE. Girls' most popular subject is English, while boys' is Maths. Psychology, Art and Design, Sociology and Media/Film/Television Studies are amongst the 10 most popular choices for girls (but not boys), while Physics, Business Studies, Geography and Physical Education are in the top 10 for boys (but not girls).
- Girls' participation in Physics is particularly low and is the least popular of the three Sciences, accounting for only 1.3 percent of female A-Level entries. For boys, Physics remains the most popular science but whereas it used to be the most popular subject overall, it now is in sixth place and represents only 5.7 percent of male entries.

2.5 A-Level Attainment

Gender differences in pass rate are much narrower at A-Level than at GCSE but gender differences still exist:

- Across all subjects, the range of difference is 4 percentage points. This is in the context of a very high pass rate.
- Girls perform better than boys in terms of those attaining an A grade (for the majority of subjects), which is a significant change over the last ten years.

2.6 Foundation Stage and Key Stage 1–3 Results

Gender patterns remain relatively stable when looking at attainment in English, Maths and Science across different stages of compulsory education:

- There is a gender gap in English from the Foundation Stage through to GCSE. Although the gender gap is largest at Key Stages 3 and 4, girls and boys do not make dramatically different progress between Key Stages.
- The gender gap in Maths is smaller than English but girls are performing slightly better than boys at Foundation Stage, and at Key Stages 1, 3 and 4.
- Gender differences in Science are relatively small.

2.7 International Evidence

Evidence from international research show similar patterns:

- International evidence for the PISA study (Programme for International Student Assessment) covering countries in the OECD (Organisation for Economic Co-Operation and Development) and their partners, shows that girls have significantly better reading scores than boys in all participating countries (except Liechtenstein).
- For Maths, boys were significantly ahead of girls in half the participating countries (but the difference was smaller than for reading), while in the other half, there was no significant difference.
- In Science, there were no systematic gender differences.
- The size of the gender gap does, however, vary between countries. Looking at the gender gap for England, the findings show that there was no statistical difference between boys and girls in maths. Alongside the majority of countries, the gender gap in literacy was statistically significant for England but was smaller than the OECD average.

The PISA study has also highlighted differing trends in learning style:

- Girls are more likely than boys to control their learning (i.e. review what they have learned; review what they still need to learn) in all but four OECD countries.
- There are also contrasting gender differences in measures of motivation. In most countries, girls claim more effort and persistence and express significantly greater interest in reading. Boys show significantly more interest in Maths in most countries – by small degrees in some countries, but by much more in others.

2.8 Gender, Social Class and Ethnicity

Gender is not the strongest predictor of attainment:

- The social class attainment gap at Key Stage 4 (as measured by percentage point difference in attainment between those eligible and not eligible for free school meals) is three times as wide as the gender gap.
- Some minority ethnic groups attain significantly below the national average and their under-achievement is much greater than the gap between boys and girls.

Nonetheless, gender is an independent and significant predictor of attainment:

- The gap in attainment at GCSE between boys and girls is relatively stable across the social class groupings i.e. the effect of gender does not systematically vary to any great extent across social class.
- However, the gender gap at GCSE does seem to vary by ethnic group, with Black Caribbean and Black Other pupils having wider gender gaps than other ethnic groups. In particular, Black Caribbean and Black Other boys are the least likely of any ethnic group to achieve 5+ A*-C GCSE passes, but Black Caribbean and Black Other girls are not disadvantaged to the same extent.

White British FSM boys are a group with particularly low attainment:

- Only 24 percent gain 5+ A*-C GCSEs (33 percentage points less well than average attainment at GCSE).
- However, White British FSM boys are not the only group with low attainment. Black Caribbean FSM boys and White British FSM girls are also doing significantly less well than the national average (respectively, 30 and 26 percentage points less well than average attainment at GCSE).

- In addition, the attainment of Black Caribbean non-FSM boys is well below the average (18 percentage points lower). The reasons for these groups' lower attainment are poorly understood but for each group, a different combination of factors (with gender playing a role) may be of relevance.

Therefore, consideration of social class and ethnicity alongside gender helps to identify which children are "underachieving":

- The analyses show that labelling boys as "underachieving" is too broad-brush, but highlighting White British FSM boys as "underachieving" (because they are a large group with the lowest attainment at GCSE, apart from traveller groups) risks losing sight of other poor performing children.

2.9 Assessing the Gender Gap

There are three main caveats about the gender gap:

- The gender gap arises mainly because of differences between boys and girls in language and literacy skills, reflected in differences in performance in English and other subjects which are literacy based. The gender gap is small or negligible for Maths and Science. These trends are apparent both from historical data from English exam records going back 60 years and from international data.
- While gender does independently predict attainment, the social class gap has greater explanatory power and for some groups, ethnicity is also a more important factor than gender.
- A focus on boys' underachievement can shift attention away from the fact that large numbers of girls are also low attainers. Tackling the scale of these numbers is arguably of greater priority and importance to policy makers than the proportionate difference between boys' and girls' attainment. Additionally, the different subject choices made by boys and girls may be more marked and have greater longer-term outcomes in terms of subsequent career choices than attainment differences.

2.10 Cognitive Differences

- In contrast to national assessments, small or negligible overall gender differences have been found on IQ tests and tests of reasoning. The relatively small gender differences detected in verbal reasoning do not seem to predict the large gender differences found in English and other humanity subjects in National Curriculum Assessments.

2.11 Pre-School Differences

Pre-school gender differences in social, cognitive and communication measures have been found, as well as gender differences in the activities that parents carry out with their children:

- Data from the Millennium Cohort Study suggest gender differences are apparent in early communicative gestures at 9 months old, with, for example, female infants more likely to wave goodbye. However, for the majority of developmental measures considered, small or negligible gender differences were found.
- At the pre-school stage, girls have better social and cognitive skills.

- Parents are more likely to read and teach songs and nursery rhymes with their daughters than their sons.
- Pre-school provision helped boost boys' early number concepts but had no differential impact on early literacy skills.

2.12 Gender and Special Educational Needs

Boys are more likely than girls to be identified with special educational needs:

- Seventy percent of children with identified SEN are boys.
- Boys are more likely than girls to attend special schools.
- Boys are nine times as likely as girls to be identified with autistic spectrum disorder.
- Boys are four times as likely as girls to be identified as having a behavioural, emotional and social difficulty (BESD).
- Gender is a better predictor than social class and ethnicity of being classified as having BESD.
- Boys from Black Caribbean, White/Black Caribbean and any Other Black background are proportionately more likely to be identified with BESD.

2.13 Gender and Behaviour

There appear to be no gender differences in pupils' attitudes towards school but there are important gender differences in boys' and girls' behaviour. There is evidence that boys and girls who become disaffected tend to take different pathways.

Concerning exclusions from school:

- Boys account for 80 percent of permanent exclusions and three quarters of fixed term exclusions.
- There has been an increase in the proportion of girls receiving permanent exclusions over the last seven years: in 1998, girls accounted for 16 per cent of permanent exclusions; 2005 figures show that they now account for 21 per cent of permanent exclusions. This is due to a decline in the percentage of boys receiving exclusions while the percentage of girls receiving exclusions has remained relatively stable.
- There is little variation in the exclusion rates of boys and girls across ethnic groups. Boys from White, Black and Mixed backgrounds are excluded (both fixed term and permanent) at approximately 2.6-3.5 times the rate of girls. The gender disparity for Asian pupils is slightly larger than average, though overall rates are low.
- FSM pupils are three times more likely to receive an exclusion (fixed period or permanent) than non-FSM pupils. The increased rate is similar for both FSM boys and FSM girls. As boys overall have a higher rate of exclusions, the rate for FSM boys is high: the proportion of fixed period exclusions is 18 percent for FSM boys compared to 7 percent for non-FSM boys. The comparable figures for girls are 6 percent (FSM girls) and two percent (non-FSM girls).

Concerning absence rates:

- Girls have slightly higher rates of authorised absence than boys but there are no gender differences in unauthorised absence.
- Higher than average levels of absence (authorised and/or unauthorised) are associated with reduced attainment at Key Stage 3 and GCSE, with a particular impact on boys.

Concerning bullying:

- Girls are more likely than boys to have been the victim of psychological bullying while boys are more likely than girls to have been the victim of physical bullying.

Concerning youth offending:

- Boys are more likely to have committed a criminal offence (e.g. handling stolen goods, stealing, carrying a weapon) than girls (33 percent compared to 21 percent).

2.14 Reasons for the Gender Gap

The literature on the reasons behind the gender gap reveal a complex story:

- Girls and boys tend to use different styles of learning. Girls tend to show greater levels of motivation and respond differently to the materials and tasks given to them.
- Overall trends indicate that girls and boys seem to relate differently to schooling and learning and girls find it easier to succeed in school settings.
- Type of school does not appear to influence the gender gap: across schools in England, there are hardly any where boys make greater progress than girls.
- However, one study found that there are a large proportion of schools where boys and girls make similar progress but these tend to be schools where school performance is weak (i.e. for both boys and girls). The corollary of this is that the gender gap is wider in better performing schools.
- Boys are more likely to be influenced by their male peer group which might devalue schoolwork and so put them at odds with academic achievement.
- A recent study found that the introduction of the National Literacy and Numeracy Strategies had an impact on the gender gap by improving the attainment of boys (more than girls) in English, and girls (more than boys) in Maths. However, the gap persists.
- The use of coursework in examinations may advantage girls but analysis does not find that this alone accounts for the gender gap.
- Other aspects of the curriculum, assessment structure and content have also been implicated. For example, reading assessments which focus on narrative may accentuate the gender gap compared to more factual-based assessment. A study has shown that boys performed significantly better on a reading comprehension task involving factual content compared to one based on narrative content. Girls' reading comprehension scores were less influenced by the content of the task.

2.15 Raising Attainment

Research indicates that:

- Combating images of laddish masculinity and establishing a strong school ethos were seen as central to raising the attainment of boys. In order for specific strategies to be successful, pupils with this sort of self-image need to be offered support and their achievements valued.
- Strategies to raise boys' achievement, if successful, are also likely to raise girls' achievement, and thus perpetuate the gender gap. It has been argued that any strategy to raise boys' achievement should not be done in a way that could be detrimental to girls' social or academic progress.
- There is not a case for boy-friendly pedagogies – pedagogies which appeal to and engage boys are equally girl-friendly.

2.16 Single Sex Education

The “jury is still out” on the impact of single sex schooling on educational attainment:

- Several international reviews and systematic reviews have failed to identify consistent or strong findings for the impact of single sex education.
- That said, there is some evidence that girls’ and boys’ attitudes to subjects are influenced by whether a pupil attends a single sex school. Boys and girls attending single sex schools are less likely to hold gender-stereotypical views about science subjects compared to pupils attending co-educational schools.

2.17 School Workforce

There are marked gender differences in the school workforce at primary level, but less so at secondary level:

- The majority of teachers in nursery and primary schools are female (84 percent) and this pattern has become increasingly accentuated over the years.
- The gender split at secondary is more even, with 56 percent of teachers being female. This represents a significant change: prior to 1993, a greater proportion of teachers were male than female.
- Men are more likely to get promoted to headship. While only 16 percent of nursery/primary school teachers are male, 34 percent of head teachers are male. While only 44 percent of secondary school teachers are male, 65 percent of head teachers are male. However, the proportion of female head teachers has increased in recent years.
- It has been hypothesised that the gender mix of teachers could play a role in the observed gender gap in attainment but this is difficult to measure and there is no strong evidence to date that this is the case.

3 Public Examinations at the End of Compulsory Schooling

3.1 Introduction

This chapter places the gender debate in the context of historical data for the last sixty years using records of public examinations taken at the end of compulsory schooling i.e. O-Level or GCSE results. There have been some important shifts towards equal opportunities for girls (in terms of equality of access to qualifications), some enduring attainment patterns (e.g. girls' advantage in English) and some changing patterns (in Maths from a small advantage for boys to a small advantage for girls).

3.2 Key Findings

Subject Choice

- Examination of the 10 most popular O-Level/GCSE subjects from the 1950s to the 1990s shows that, for each decade, 8 out of 10 subjects chosen are the same for boys and girls. In 2006, 9 out of 10 subjects chosen were the same.
- Historically, boys were more likely to take the separate sciences and Physics in particular. Now, girls are slightly more likely to take Double Award Science than boys.
- Other subjects show stereotypical gender biases with, for example, girls more likely to take arts, languages and humanities and boys Geography, Physical Education and IT. Boys are more likely to opt for the following Design and Technology GCSEs: Graphic Products, Systems and Control, Electronic Products and Resistant Materials. Girls are more likely to opt for Food Technology and Textiles Technology GCSE.
- Differing preferences are also apparent in some of the vocational subjects piloted for 14-16 year olds, with some subjects showing very pronounced bias (girls: hair and beauty; care and childcare; boys: construction, engineering and motor, manufacturing).

English and Maths

- The gender gap in English in favour of girls has been wide and persistent over six decades of exam records (an average of 12 percentage points and a range of 6 to 18 percentage points).
- In contrast, the narrower gender gap in Maths has shifted from a male advantage (an average of 4 percentage points and a range of 1 to 8 percentage points between 1951 and 1991) with a peak between 1978 and the mid-1980s, to a slim female advantage from 1997 to the present (1–2 percentage point advantage).

Science

- The gender gap has always been relatively small in the Sciences. Currently, girls are 2–3 percentage points ahead of boys in Double Award Science. Few students now take the separate sciences, but of those that do, boys do one percentage point better than girls in Physics and Biology. Boys and girls perform the same in Chemistry (making the separate sciences the only subjects where there isn't a female advantage).

Other Subjects

- There are persistent historical gender gaps in other major O-Level/GCSE subjects, such as French, Religious Studies and Art with girls doing consistently better over six decades of national exam data.
- The pattern in Geography and History has been more complex. In History, girls' current advantage (an average of 6 percentage points ahead since 1988) mirrors the gap from 1951–1968 (average 7 percentage points) but contrasts with the period between 1975 and 1985 when boys were slightly ahead of girls. In Geography, the gender gap had traditionally been fairly narrow, with boys slightly ahead, until the mid 80s when a larger gap in favour of girls opened up (an average 6 percentage point gap since 1988).

Attainment at A and G Grades

- Attainment at each end of the distribution of grades also varies by gender. Girls are more likely than boys to gain an A* grade at GCSE. Boys are a little more likely to gain a G grade at GCSE or to gain no GCSEs at all.

Note on How to Measure the Gender Gap

The gender gap in attainment is described here in terms of percentage point difference between boys' and girls' scores on threshold measures (e.g. 5+ A*-C GCSEs). The issue of how to measure differences is explored in more detail in Chapter 6. Other ways of measuring differences include odds ratios, proportionate differences and effect sizes.

Notes on Time Series Charts and Tables

Time series have been constructed from national attainment data from 1951 records to the present. The way data have been collected and recorded have changed and therefore the time series charts should be treated as indicative of the gender pattern and how it has changed over time, rather than as an exact record of changes in attainment.

Up till 1986, only O-level results were recorded in Statistics of Education, but between 1986 and 1988 O-levels and CSEs were both recorded. This caused a small increase in the numerator (as grade 1 CSE passes were added to O-level passes) and a much larger increase in the denominator, as all CSE entries were included. This caused a marked fall in the pass rate for O-level or equivalent as illustrated on the charts for individual subjects.

1951–1977 Statistics from England and Wales

1977 onwards–Statistics from England only

Pre-1975 O-Level (pass or fail)

1975–1988 O-Level (A-C – equivalent to old pass)

1986–1987 O-Level and CSE reported together

1988 GCSE A-C was introduced and GCSE/O-Level and CSE reported together

1989–2006 GCSE (A* grade was introduced in 1994)

Sources:

O-Level and A-Level

1951–1988 Statistics of Education: School Leavers

GCSE and A-Level

1989–1991 Statistics of Education: School Examinations GCSE and GCE

1992–1993 Statistics of Education: Public Examinations GCSE and GCE

1994–2004 SFR25/2005 GCSE and Equivalent Results and Associated Value Added Measures for Young People in England 2003/04 (Final), issued June 2005

2005 SFR26/2006 GCSE and Equivalent Results and Associated Value Added Measures in England 2004/05 (Final), issued June 2006

A-Level

SFR25/2006 GCSE/VCE A/AS Examination Results for Young People in England 2004/05 (Final), issued June 2006

2006 SFR01/2007 GCSE and Equivalent Examination Results in England 2005/06 (Revised), January 2007

2006 SFR 02/2007 GCE/VCE A/AS and Equivalent Examination Results in England, 2005/06 (Revised), issued January 2007.

3.3 Number of Entries

The pattern for GCSE entry has changed over the years. In the 1960s and 1970s, boys took more O-Levels than girls. In the 1960s, on average, of those entered for any O-Level, 55 percent were male and 45 percent were female)¹. Since the 80s, the number of entries have been split evenly between boys and girls.

3.4 Subject Choices

3.4.1 Historical Perspective

O-Level/GCSE subject choices

Figure 3-1 shows the 10 most popular O-Level/GCSE subjects for boys and girls across five decades.

Overall, there is consistency across the decades in the core O-Levels/GCSEs taken. While there are gender differences in the proportion of boys/girls taking particular subjects, it is important to note that for each decade from the 1960s to the 1990s, 8 out of 10 subjects in the 'top 10' are the same for boys and girls. In 2006, it was 9 out of 10 subjects.

Some of the changes and differences between boys and girls in the subjects chosen are:

- Maths has generally been a more popular (higher ranking) subject with boys than girls but this has shifted to a more equal pattern. In the 1950s, on average, of those entered for Maths O-Level, 66 percent were boys and 34 percent were girls. This gap decreased gradually in the 1970s and, since 1986, the gender split has been evenly balanced.
- Girls were also less likely to be entered for English O-Level. In the 1950s and in the 1960s, on average, 45 percent of entries were for girls. This had reversed by the early 1970s. Since 1986, the gender split has been evenly balanced.
- An O-Level/GCSE covering aspects of cookery has been in the top 10 for girls each decade (variously known as Domestic Subjects, Cookery, Home Economics or Food Technology) until 2006 when it dropped to eleventh place with Physical Education having slightly more entries. The subject doesn't feature in boys' top 10 in any decade.
- In the 60s and 70s, all three sciences (Biology, Chemistry and Physics) are in the boys' top 10 whereas only Biology features in the girls' top 10. Figures 3-2, 3-3 and 3-4 show, however, how the gender split has changed significantly over the decades to a roughly 60(boys)/40(girls) split. But with the introduction of Double Award Science, a very small proportion of students take any of the separate Sciences. For Double Award Science, the split is more equitable and this is reflected in the top 10 table with Double Award Science featuring at (5) for both boys and girls.

¹ Children in grammar schools were most likely to take O-Levels.

Figure 3-1 Ten Most Popular O-Levels/GCEs (in Rank Order) Over the Last 60 Years

Rank	1956		1966		1976		1985*		1996		2006	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
1	English Language	English Language	English Language	English Language	English Language	English Language	English Language	English Language	Maths	English	Maths	Maths
2	Maths	English Literature	Maths	English Literature	English Literature	Maths	Maths	Maths	English	Maths	English	English
3	French	French	English Literature	Biology	Physics	Biology	Physics	Biology	English Literature	English Literature	English Literature	English Literature
4	English Literature	History	Geography	Maths	English Literature	Maths	Geography	English Literature	Double Award Science	Double Award Science	Double Award Science	Double Award Science
5	Geography	Geography	French	French	Geography	French	English Literature	French	Geography	French	History	French
6	History	Maths	Physics	History	Biology	Geography	Chemistry	Art	French	Geography	Geography	Art & Design
7	Physics	Biology	History	Geography	Chemistry	History	Biology	Geography	History	History	French	History
8	Chemistry	Art	Chemistry	Art	History	Art	Art	Chemistry	Art & Design	Art & Design	Physical Education	Geography
9	Latin	Domestic Subjects	Technical Drawing	Religious Knowledge	French	Cookery	History	History	Design & Technology	Design & Technology	Joint ranking 9 & 10 D&T: Resistant Materials	Religious Studies
10	Art	Religious Knowledge	Biology	Cookery	Art	Religious Knowledge	French	Religious Studies	Craft, Design & Technology	Home Economics	Art & Design	Physical Education

Note: Shaded areas indicate subjects which are only in top 10 for one of the genders for one particular year
 *1985 rather than 1986 chosen as full subject data is not available for 1986

Source: Department for Education's Statistics of Education. See 'Notes on Time series Charts and Tables' for further information

Figure 3-2 Physics O-Level/GCSE Time Series (1956–2006): Proportion of Boys vs. Girls

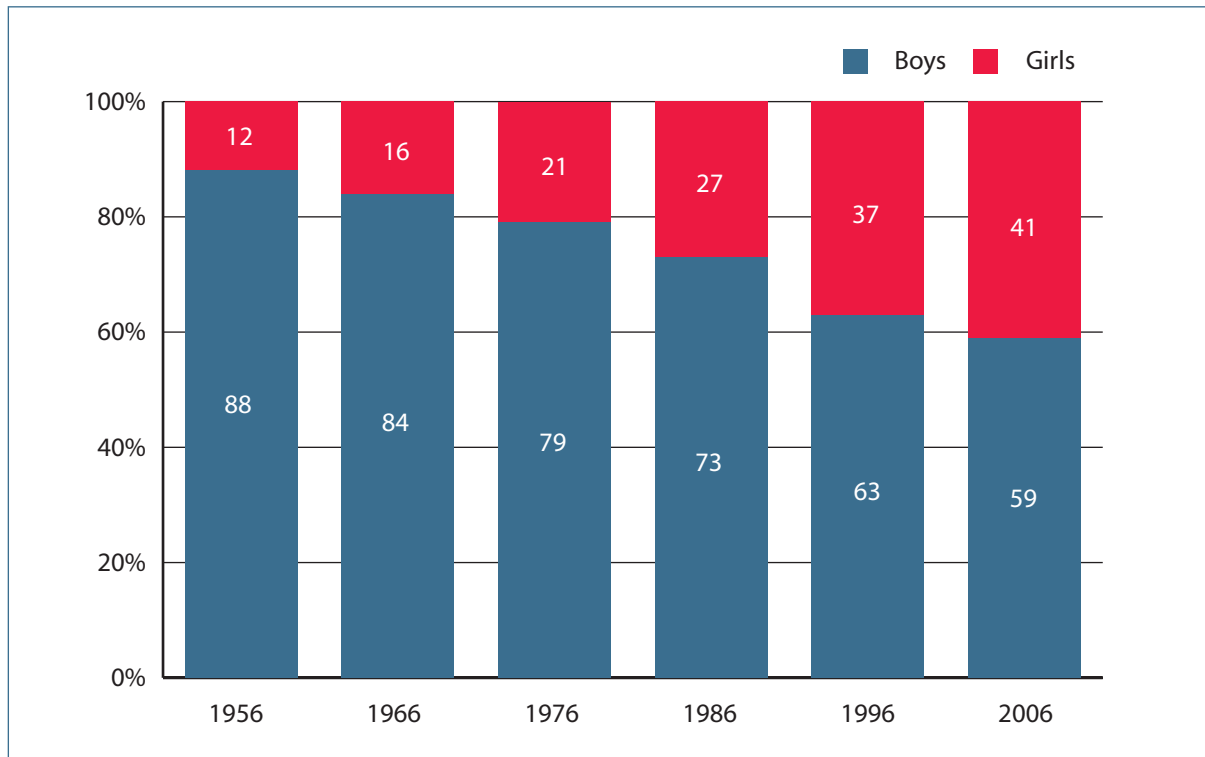


Figure 3-3 Chemistry O-Level/GCSE Time Series (1956–2006): Proportion of Boys vs. Girls

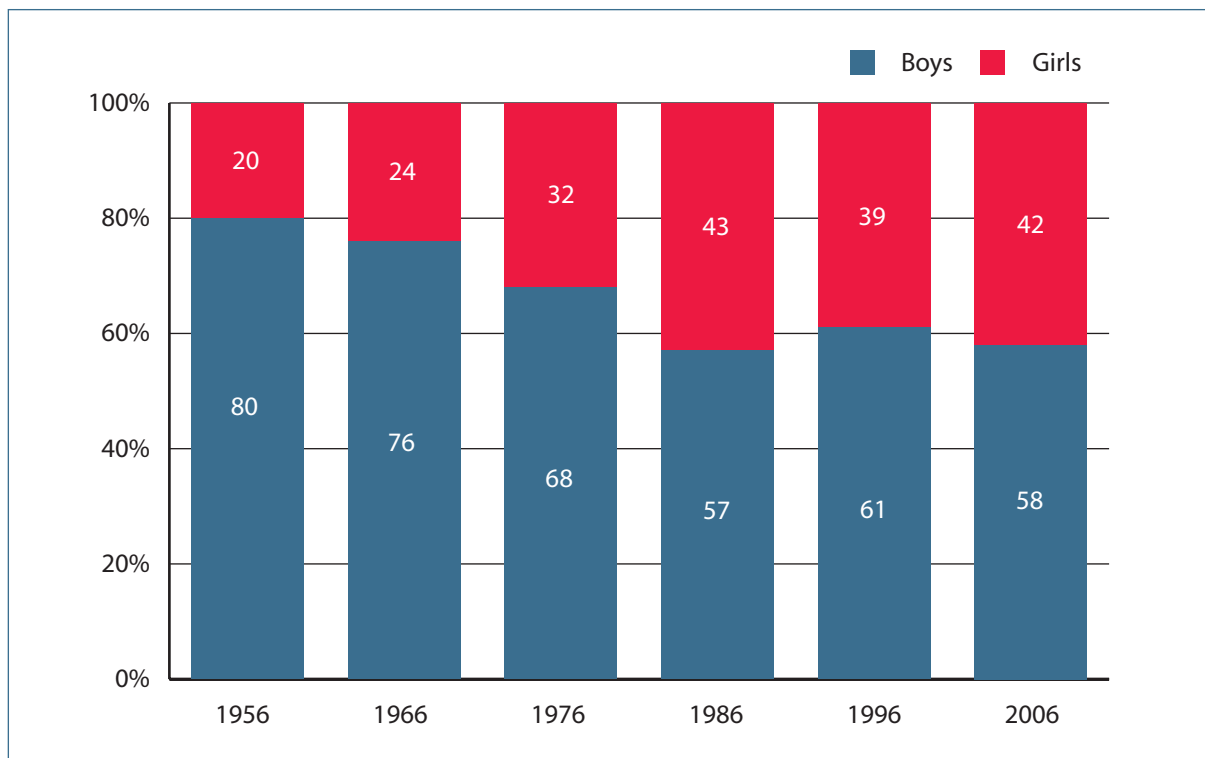
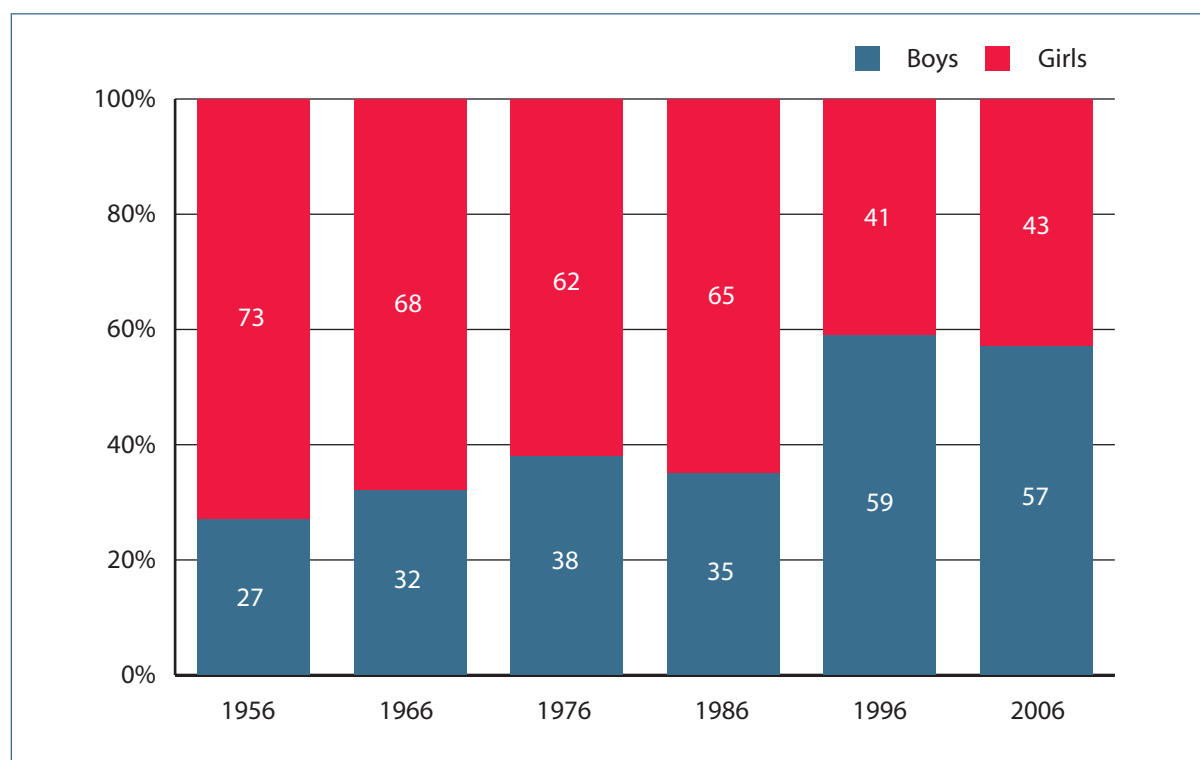


Figure 3-4 Biology O-Level/GCSE Time Series (1956–2006): Proportion of Boys vs. Girls

Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

3.4.2 Current Data

GCSE 2006²

Looking at current subject choices in more detail, it is clear that there are distinct gender differences in the choices students make about which subjects they study at Key Stage 4. The following figures show the proportion of pupils at the end of Key Stage 4 taking the subject³.

Science: The majority of pupils take Double Award Science. Girls are more likely than boys to take it (70 percent of girls vs. 67 percent of boys) while boys are more likely to take the separate sciences than girls.

Modern Foreign Languages: 51 percent of pupils take a modern foreign language⁴ and girls are more likely to do so (57 percent of girls and 45 percent of boys).

Design and Technology (D&T): D&T options seem stereotypically dichotomous with boys much more likely to take D&T in Resistant Materials, Graphic Products, Systems and Control and Electronic Products. Girls are much more likely to take Textiles Technology and Food Technology.

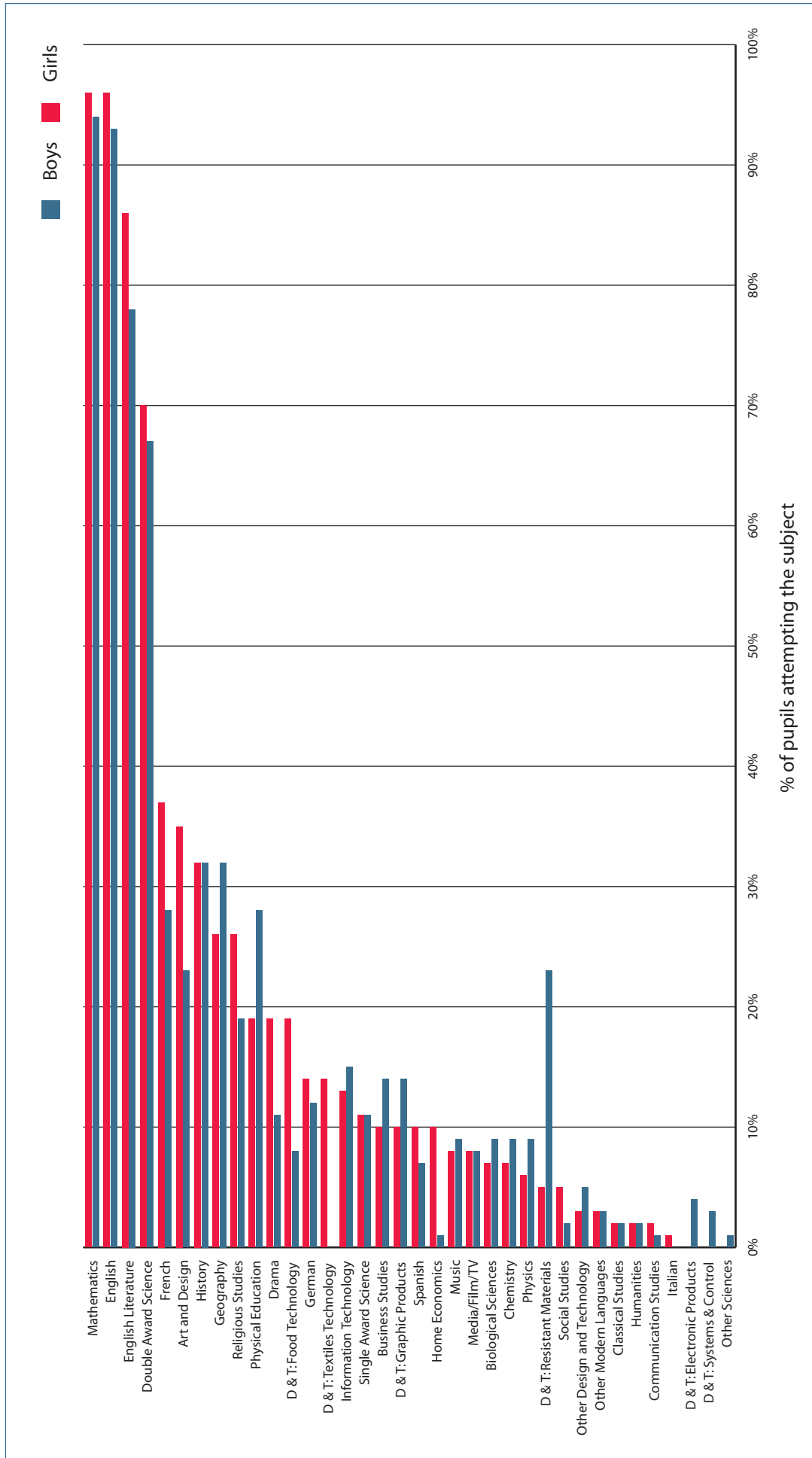
Other Subjects: Girls are more likely than boys to take Art and Design, Home Economics, English Literature, Drama and Religious Studies. Boys are more likely to opt for Business Studies, Geography and Physical Education and slightly more likely to opt for Information Technology.

² SFR 01/2007 GCSE and Equivalent Examination Results in England 2005/06 (Revised), issued January 2007.

³ The previous section examined gender splits of those entered for a particular subject as these historical data were only reported in this way.

⁴ Figures were down in 2006 for both boys and girls compared to 2005 figures (59 percent of pupils – 65 percent of girls and 54 percent of boys) since modern foreign languages were made non-compulsory in 2004.

Figure 3-5 Percentage of Pupils Entered for Each GCSE Subject by Gender (2006)



Source: SFR 01/2007 GCSE and Equivalent Examination Results in England 2005/2006 (Revised), issued January 2007

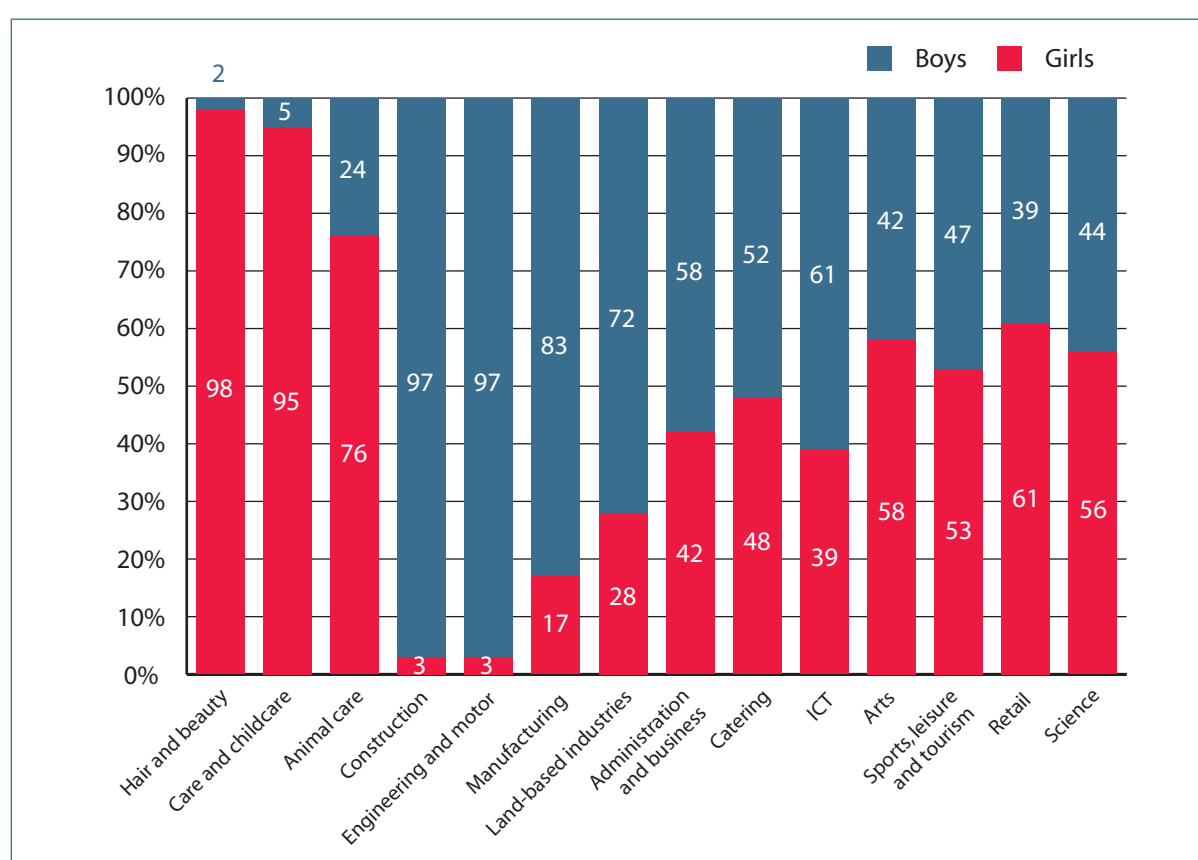
Vocational Subject Choices

There are also key gender differences in vocational subject choices. The Increased Flexibilities Programme⁵ (IFP) was introduced in 2002, aiming to 'create enhanced vocational and work-related learning opportunities for 14–16 year olds who can benefit most'⁶.

In terms of the overall cohort of IFP students, take up by boys was greater: 56 percent were male and 44 percent were female.

Some vocational areas were dominated by one gender. For example, the vast majority of students in the hair and beauty, care and childcare and animal care areas were females. Most students in the construction, engineering and motor vehicles, manufacturing and land-based areas were male.

Figure 3-6 Proportion of Pupils Taking Subjects in the Increased Flexibility Programme by Gender (2003)



Source: Golden et al. 2004

3.5 O-Level/GCSE Attainment

This section starts by examining the historical trend in the commonly used threshold of percentage of pupils gaining 5 or more O-Levels or GCSEs. As this measure masks variation in the gender pattern for individual subjects, the current trends in different subjects is outlined followed by historical trends in the most commonly taken O-Levels/GCSEs.

⁵ Evaluated by Golden, S., Nelson, J., O'Donnell, L. & Rudd, P. (2004). *Evaluation of Increased Flexibilities for 14–16 Year Olds: Profile of Partnerships and Students 2002 and 2003*, NFER.

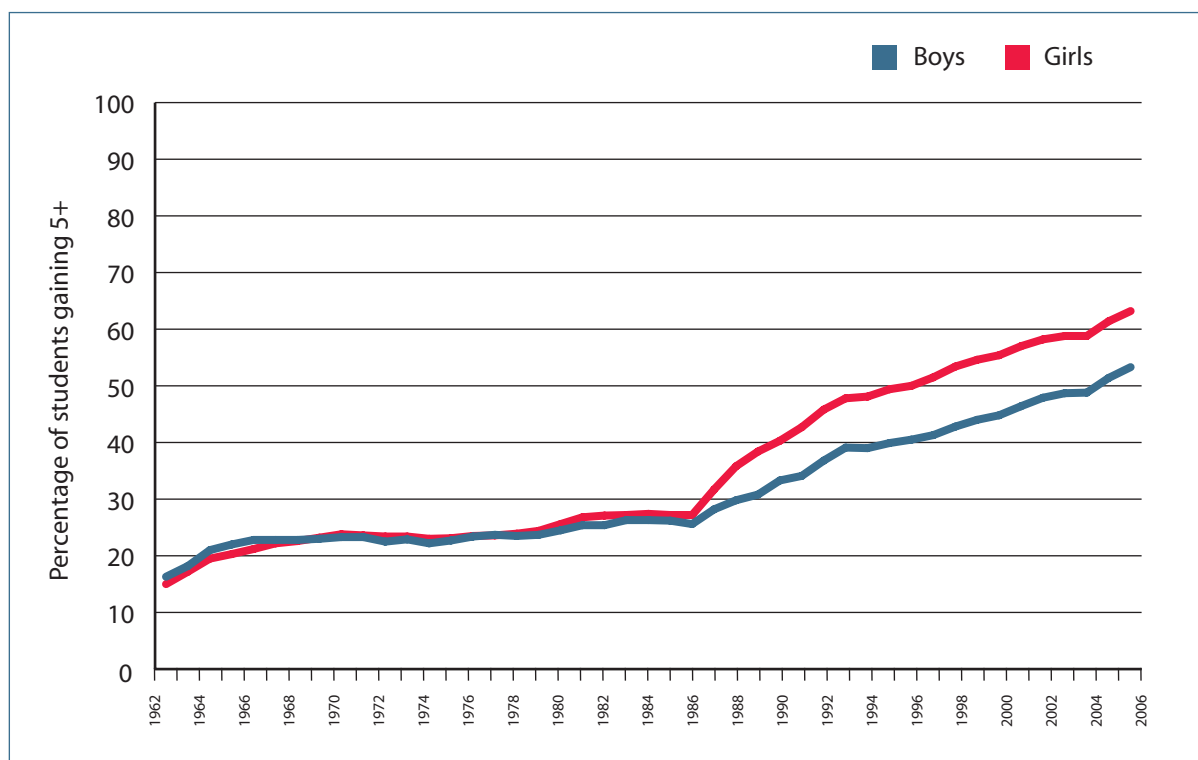
⁶ Partnerships were formed between further education (FE) colleges and schools and, in some instances, other training providers and employers. A total of 2,020 secondary schools, special schools and PRUs were engaged in partnerships for the second cohort of IFP (around 45 percent of all state secondary and special schools in England).

3.5.1 Overall Changes (5+ O-Levels/GCSEs and Average Point Score)

Figure 3-7 is a timeseries of boys' and girls' attainment at O-Level/GCSE between 1962 and 2006. Boys were slightly more likely than girls to reach the 5+ threshold between 1962 and 1967. Between 1968 and 1986 the difference between the sexes was either around zero or 1-2 percentage points in girls' favour. Since 1988, a significant gender gap in favour of girls became apparent and this gap quickly increased and then subsequently became very stable at around 10 percentage points difference, with little variation since 1995. The gender gap is currently 9.6 percentage points: 63.4 percent of girls and 53.8 percent of boys achieved 5+ GCSEs or equivalent⁷.

Examining average point score⁸ differences between boys and girls helps to quantify what the difference means in terms of level of qualification (see Figure 3-8). The gender difference of 41 points in the simple average point score is equivalent to a difference of one GCSE at grade C. The gender difference in the capped average point score (i.e. just looking at the best 8 GCSEs) is equivalent to a difference of one GCSE at grade D or E.

Figure 3-7 Percentage of School Leavers Achieving 5+ A-C (or Pass) O-level or A*-C GCSE by Gender (1962–2006)



Source: Department for Education Statistics of Education

⁷ As a proportion of 15 year olds.

⁸ Points are allocated to different grades and to different qualifications (i.e. GCSE, GCSE (vocational), GNVQ) for comparison purposes in order to obtain an average point score across the various Key Stage 4 qualifications.

Figure 3-8 Average Point Score: GCSE and Equivalent Qualifications by Gender (2006)

Average capped GCSE and equivalents point score *		Average GCSE and equivalents score
Boys	278	341
Girls	307	382
Gender Difference	29	41

Note: Based on data of 15 year olds

*Average capped point scores are calculated using the best 8 GCSEs or equivalent results

Source: SFR 01/2007 GCSE and Equivalent Results in England 2005/06 (Revised), issued January 2007

The overall change dating from the late 80s (as shown in Figure 3-7), could be attributable to the introduction of GCSEs, replacing O-Levels in 1988. The National Curriculum was also introduced at this time, giving less scope for specialisation in particular subjects (Machin & McNally 2005⁹).

GCSEs, unlike O-Levels, are criterion-based assessments, rather than measured in relation to peer performance, ending the rationing of the top grades. Additionally, many more pupils were entered for GCSE than had been the case for O-Levels (which were taken mainly by children attending grammar and independent schools) though this does not explain the rising standards following the introduction of GCSEs.

However, the following analyses show that the gender pattern for 5+ A*-C masks the fact that girls have done better than boys in several subjects (e.g. English, English Literature, French, History, Religious Studies) prior to the 1980s, and in other subjects, the gender gap is not as large as the post-1980 5+ A*-C data indicate. The following sections explore the current gender gap across individual subjects followed by timeseries data on subjects to gain an historical context.

In examining the gender gap, it is important not to lose sight of the fact that:

- There is an overarching trend of improving results (for boys as well as girls).
- Notwithstanding these higher pass rates, over a third of girls (37 percent) and nearly half of boys (46 percent) do not reach the expected level of 5+ A*-C GCSEs (2006 revised figures).

3.5.2 Summary of the Current Gender Gap at GCSE by Subject

Girls do better than boys in the majority of GCSE subjects¹⁰. There are only four exceptions: Chemistry where there is no gender difference, and Physics and Biological Sciences where boys do better by one percentage point (and Other Sciences where boys do 5 percentage points better). Only a small proportion of students now take the separate sciences.

Smaller gender differences (in girls' favour) of 5 percentage points or less tend to be in Science/Maths subjects:

- Single Award Science, Double Award Science and Maths as well as Business Studies, Classical Studies and Physical Education.

⁹ Machin, S. & McNally, S. (2005) Gender and Student Achievement in English Schools, *Oxford Review of Economic Policy*, 21 (3).

¹⁰ The data in this section are for those pupils who attempted the subject.

The largest gender differences (more than 10 percentage points) are for:

- Humanities, the Arts and Languages (English, English literature, Humanities, Art and Design, Communication Studies, Media/Film/TV, Drama, Social Studies, French, German as well as Home Economics and Religious Studies).

Interestingly, girls do much better than boys in Design and Technology – both in the subjects that are popular amongst girls and the subjects that are popular with boys. Girls are much more likely to take Textiles Technology –virtually no boys take this – and Food Technology and the gender gap in attainment in these subjects is over 17 percentage points. They are less likely to take Systems and Control, Graphic Products, Resistant Materials and Electronic Products, yet girls are 14-17 percentage points ahead of boys.

3.5.3 English O-Level/GCSE

Since the 1950s when attainment by gender records began, girls have done significantly better than boys in English O-Level and subsequently at GCSE. The average gender gap is 12 percentage points but the gap has varied from between 6 and 18 percentage points. Figure 3-10 shows there was a smaller gap between 1979 and 1985 (9 percentage point gap) and the widest gap between 1992 and 2001 (a 16 percentage point gap).

Figure 3-9 GCSE Attainment by Subject and Gender (2006 Revised Figures)

	% of those entered gaining grades A*-C		
	Boys	Girls	Gender Gap
D & T: Textiles Technology	38	70	32
Communication Studies	43	63	20
Art and Design	59	78	19
D & T: Food Technology	47	64	17
D & T: Graphic Products	49	66	17
Other Design and Technology	54	71	17
D & T: Electronic Products	58	75	17
D & T: Resistant Materials	51	67	16
Media/Film/TV	52	68	16
D & T: Systems & Control	58	72	14
English	55	69	14
Social Studies	48	62	14
Drama	63	76	13
Humanities	40	52	12
Home Economics	40	52	12
English Literature	61	73	12
Religious Studies	63	75	12
French	58	69	11
German	63	74	11
Spanish	62	71	9
Information Technology	57	65	8
Other Modern Languages	76	84	8
Music	69	76	7
Italian	77	83	6
Geography	63	69	6
History	63	69	6
Single Award Science	18	23	5
Business Studies	58	63	5
Classical Studies	86	90	4
Mathematics	55	57	2
Double Award Science	56	58	2
Physical Education	60	61	1
Chemistry	91	91	0
Physics	92	91	-1
Biological Sciences	90	89	-1
Other Sciences	57	52	-5

Note: Figures show A*-C attainment as a percentage of those entered for the exam

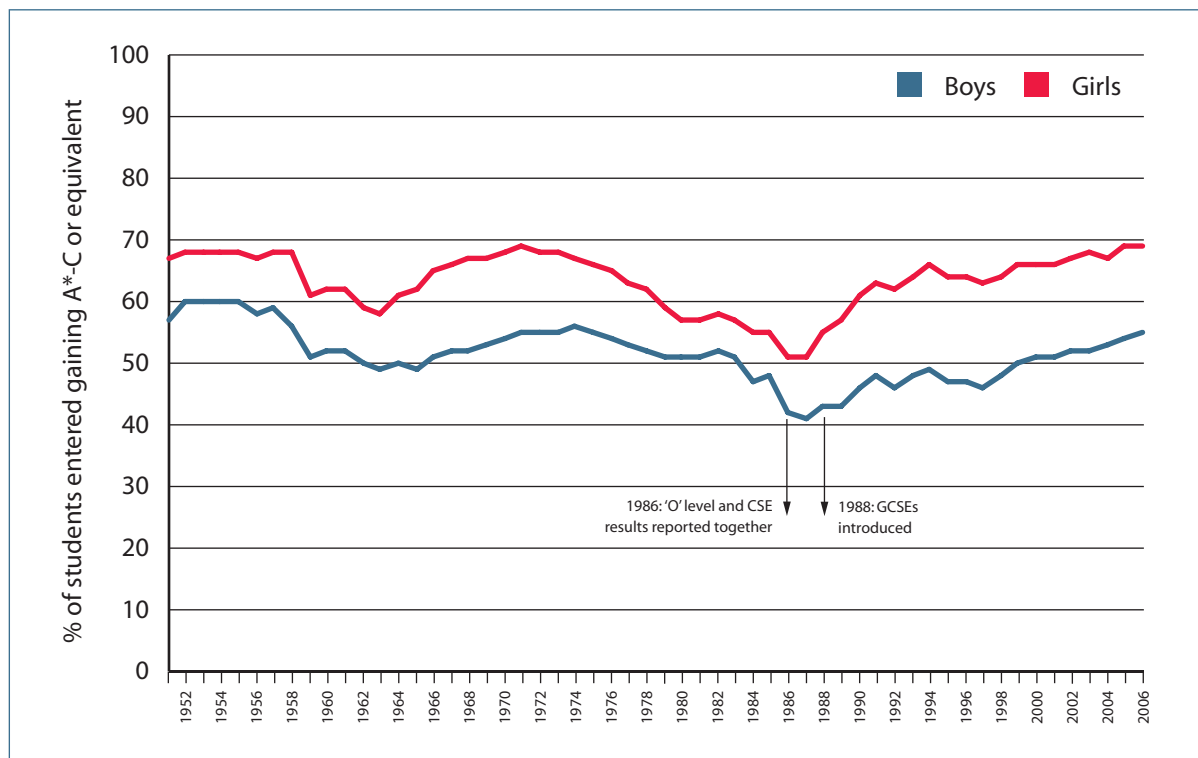
Dark grey shading: female advantage of more than 10 percentage points

White: female advantage of 1-9 percentage points

Darker Blue shading: no female advantage

Source: SFR 01/07 GCSE and Equivalent Results in England 2005/06 (Revised), issued January 2007

Figure 3-10 English O-level/GCSE Time Series: Attainment by Gender (1951–2006)

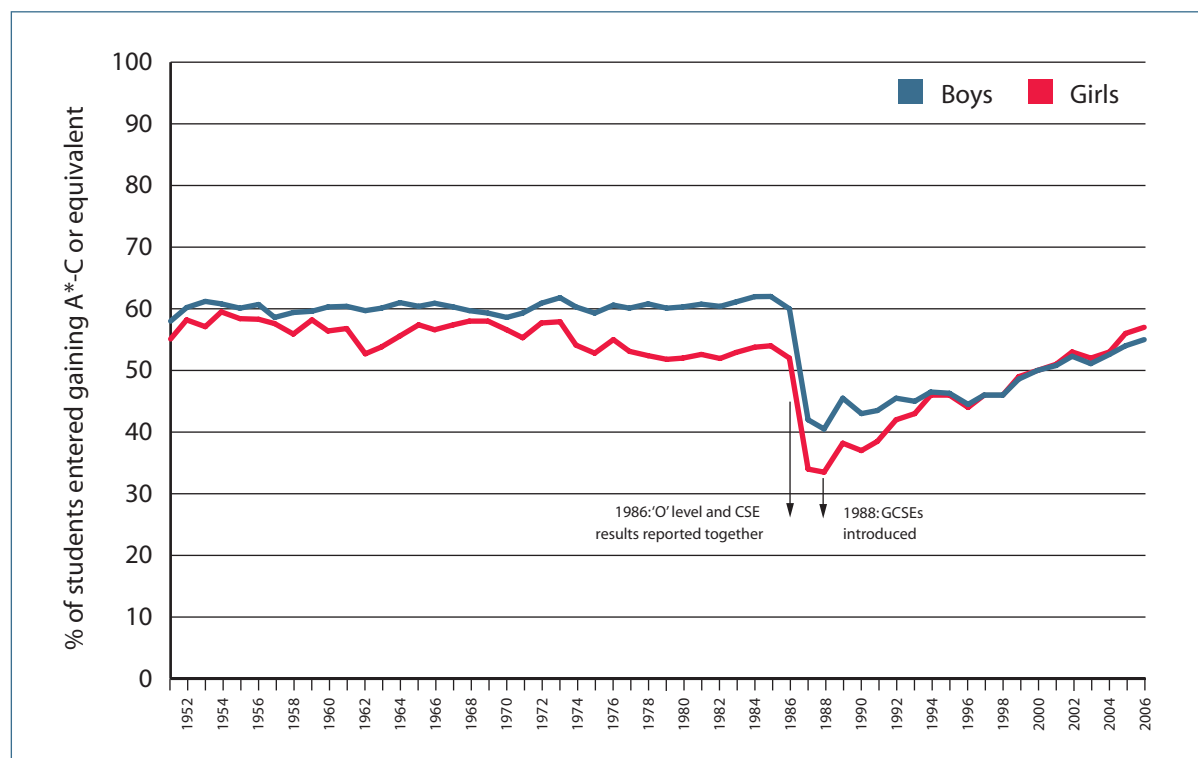


Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

3.5.4 Maths O-Level/GCSE

The pattern of boys' and girls' attainment in Maths O-Level/GCSE is very different to English and has changed significantly since the 1950s as shown in Figure 3-11. For four and a half decades (from 1951 to 1994) boys performed better than girls at Maths O-Level or GCSE, an average advantage of 5 percentage points. Between 1978-1986 this reached a peak of 8 percentage points in boys' favour.

In the last decade, there has either been a negligible gender gap or a small advantage for girls. In 2006, this was a 2 percentage point advantage. However, the range of difference (from 2 percentage points in girls' favour to 8 percentage points in boys' favour) is a much smaller gender gap than that found for English O-Level/GCSE (where it was in the range 6-18 percentage points).

Figure 3-11 Maths O-level/GCSE Time Series: Attainment by Gender (1951–2006)

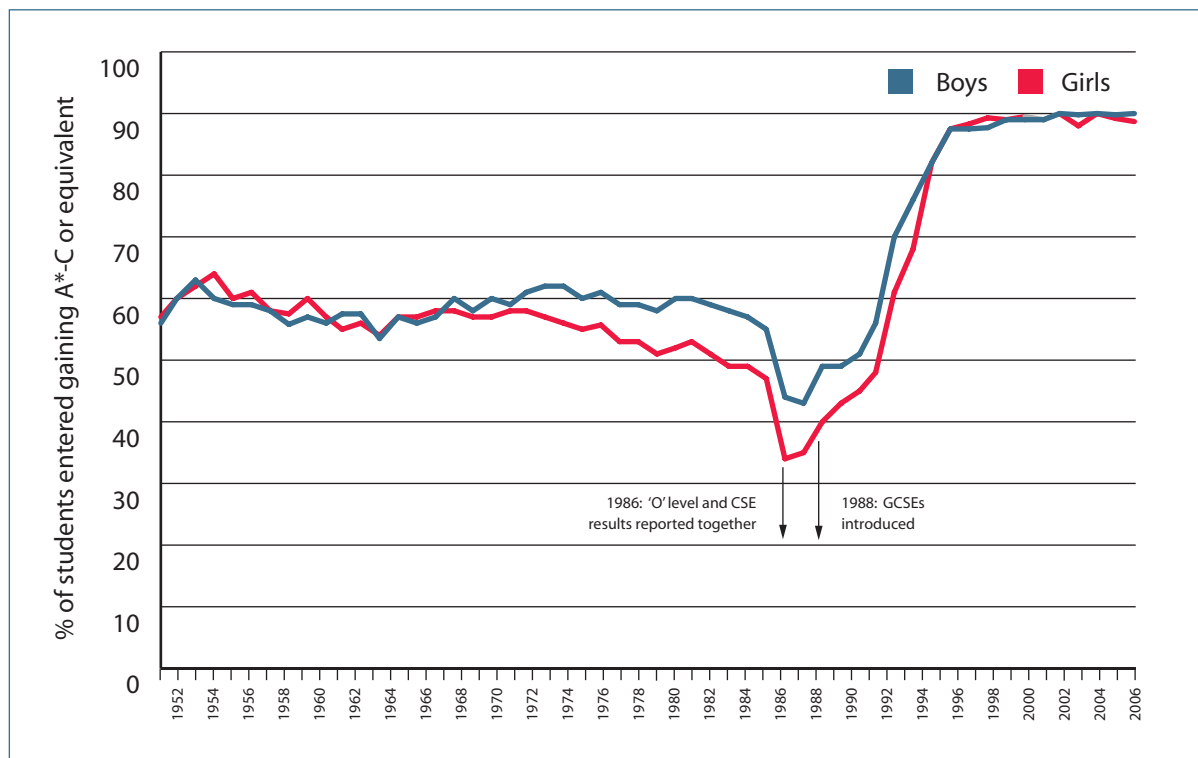
Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

3.5.5 Sciences O-Level/GCSE

In examining trends over time in the individual sciences, it is important to note that the introduction of Double Award and Single Award Science in 1992 has had a dramatic effect on both overall patterns of attainment (for all students) in the separate sciences as the number of students entered for these subjects dropped significantly and on the gender gap. Students who do take the separate sciences are more likely to be in grammar or independent schools and they are also likely to be the more able students. This has resulted in a much higher pass rate for students taking the separate sciences. With only the most able students taking a separate science, gender gaps in the separate sciences are now negligible.

Biology has been a popular subject, and the most popular science, amongst girls. Girls have had variable performance relative to boys as shown in Figure 3-12. In the 1950s and 60s, the gender difference in attainment was small (some years boys did slightly better, other years girls). Then, from the 1970s, a male advantage gradually emerged of up to a 9 percentage point difference, until 1994 when the gender difference was again virtually eliminated. Since 1992, the number of students entered for Biology dropped significantly, following the introduction of Double Award and Single Award Science. The gender gap in attainment in Biology is now negligible.

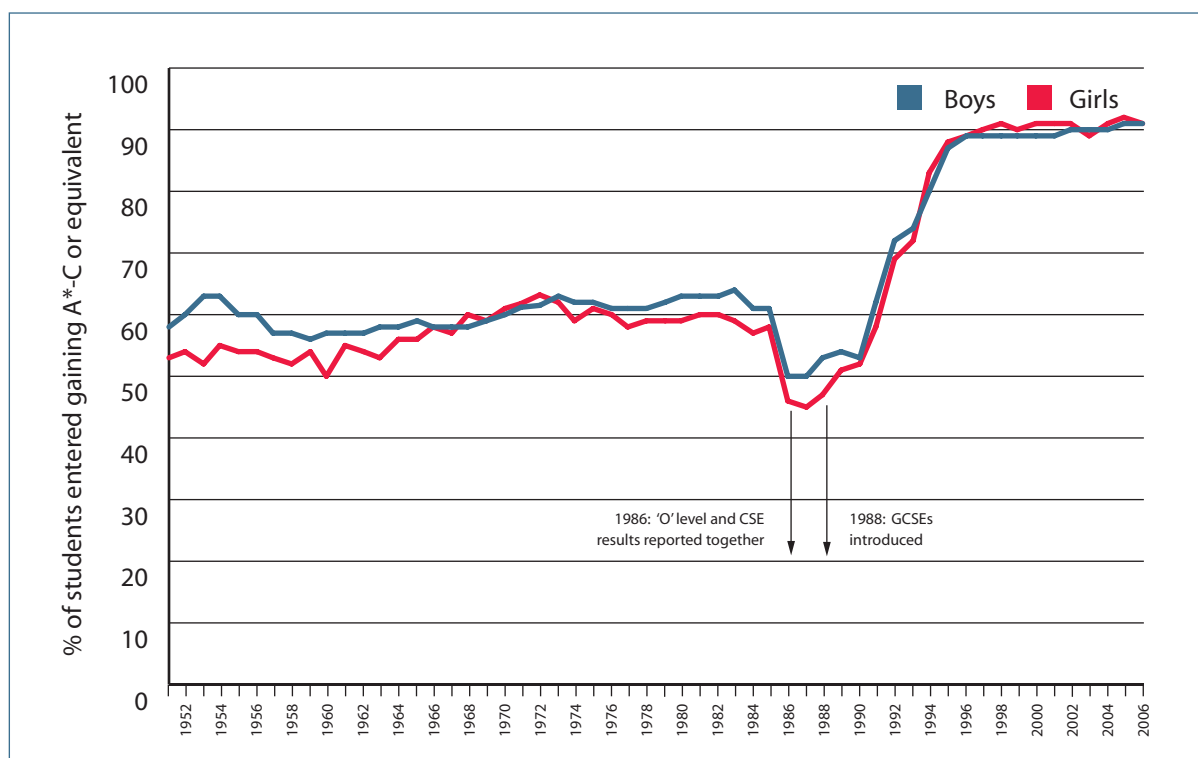
Figure 3-12 Biology O-level/GCSE Time Series: Attainment by Gender (1951–2006)



Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

The gender gap in Chemistry has been relatively small. From the 50s until 1993, boys were predominantly ahead of girls. Since 1994, this has swung to girls being slightly ahead of boys. Again, since the early 90s, the number of students taking Chemistry has dropped significantly and the gender gap in attainment is negligible.

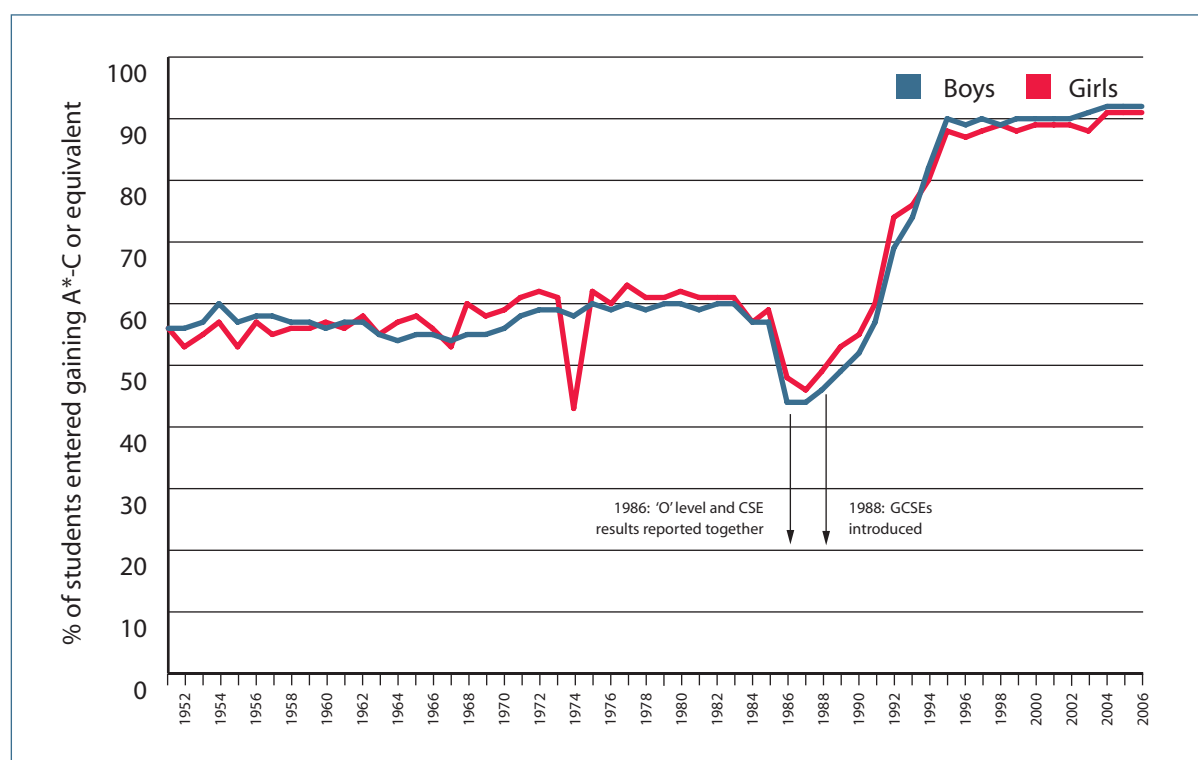
Figure 3-13 Chemistry O-level/GCSE Time Series: Attainment by Gender (1951–2006)



Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

As previously discussed, Physics has been an unpopular subject amongst girls, not appearing in the top ten subjects across the six decades. While the 1950s showed boys' attainment slightly ahead of girls, from the 1960s until 1993, girls were slightly ahead of boys in achieving the expected threshold. Since then, boys have been slightly ahead of girls. It could be argued that the reasons girls do better is because girls with a particular aptitude or passion for physics were the ones that took it while a wider range of aptitude is found in boys as the subject has broader appeal amongst boys. However, this does not explain the findings from the 1950s when only 12-13 percent of girls were entered for physics but boys did better, nor the current data where there is a slight male advantage.

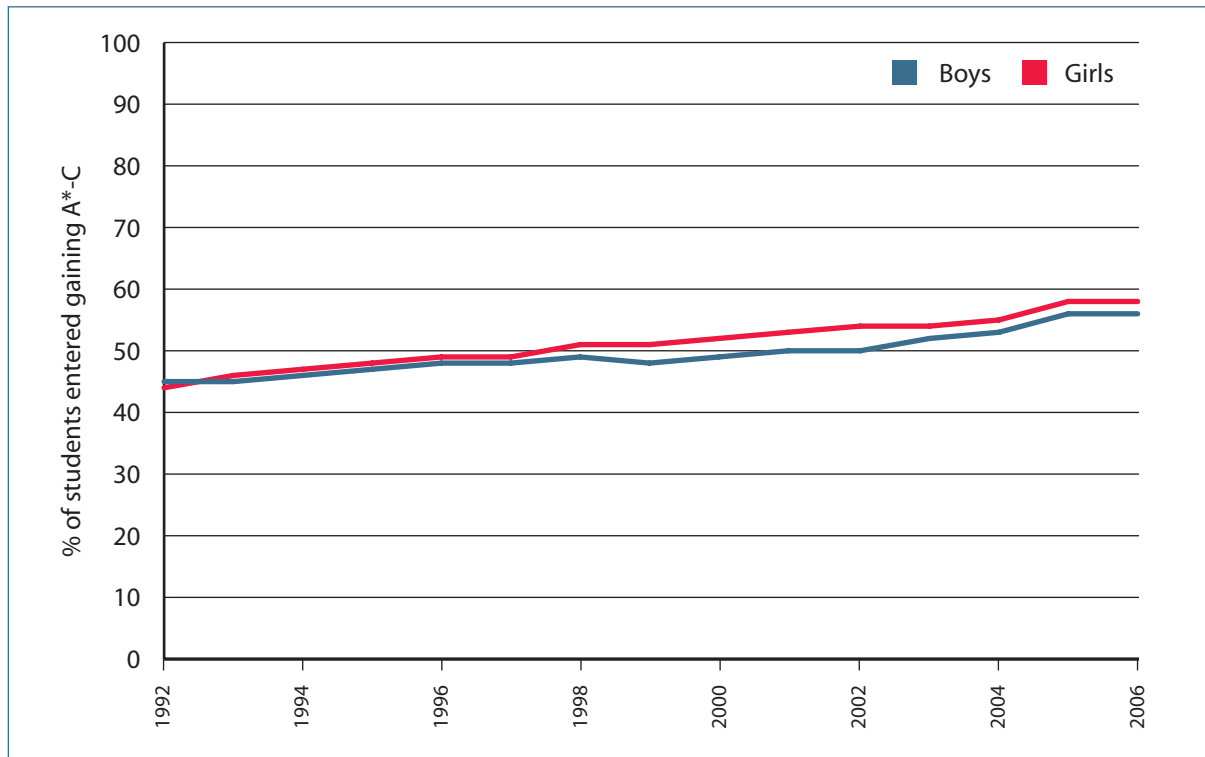
Figure 3-14 Physics O-level/GCSE Time Series: Attainment by Gender (1951–2006)



Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

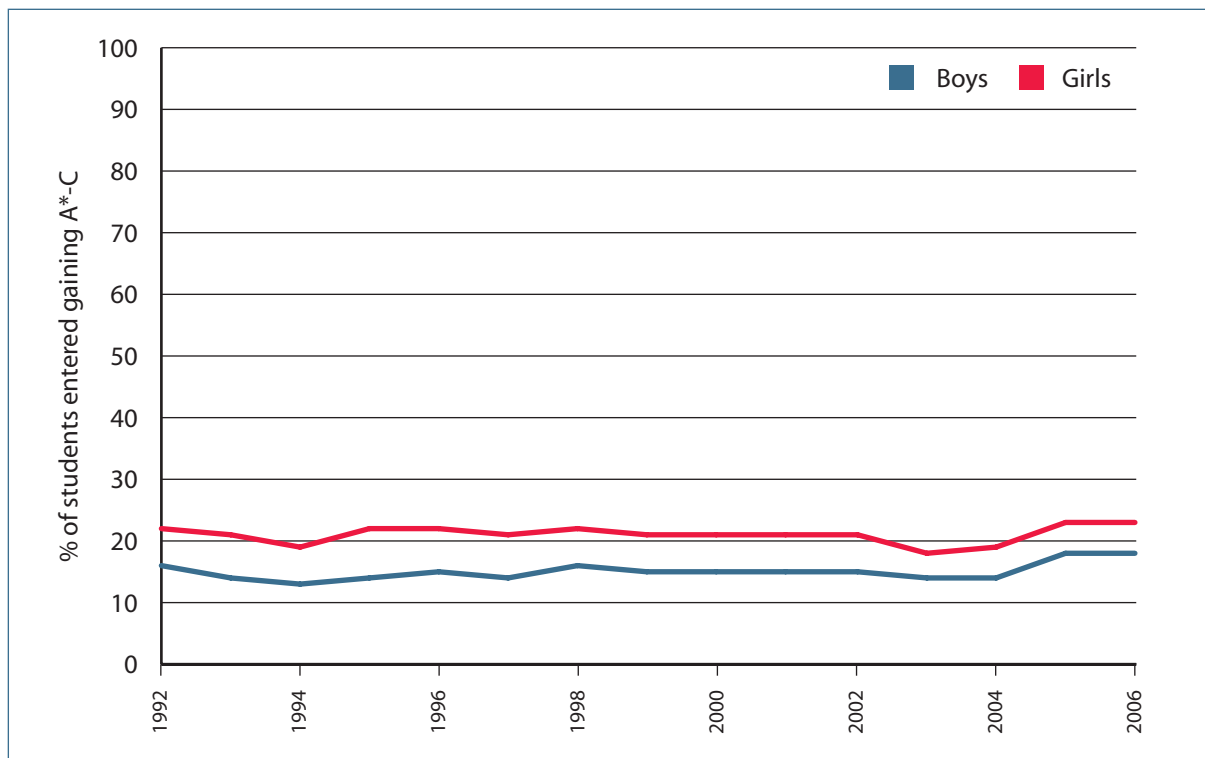
Since Double Award and Single Award Science were introduced in 1992, the gap between boys and girls in Double Award Science has gradually increased (girls currently 2–3 percentage points ahead). The gender gap in Single Award Science (taken by only a small proportion of pupils) is larger (up to 8 percentage points difference in 1995) but has narrowed.

Figure 3-15 Double Award Science O-level/GCSE Time Series: Attainment by Gender (1992–2006)



Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

Figure 3-16 Single Award Science O-level/GCSE Time Series: Attainment by Gender (1992–2006)



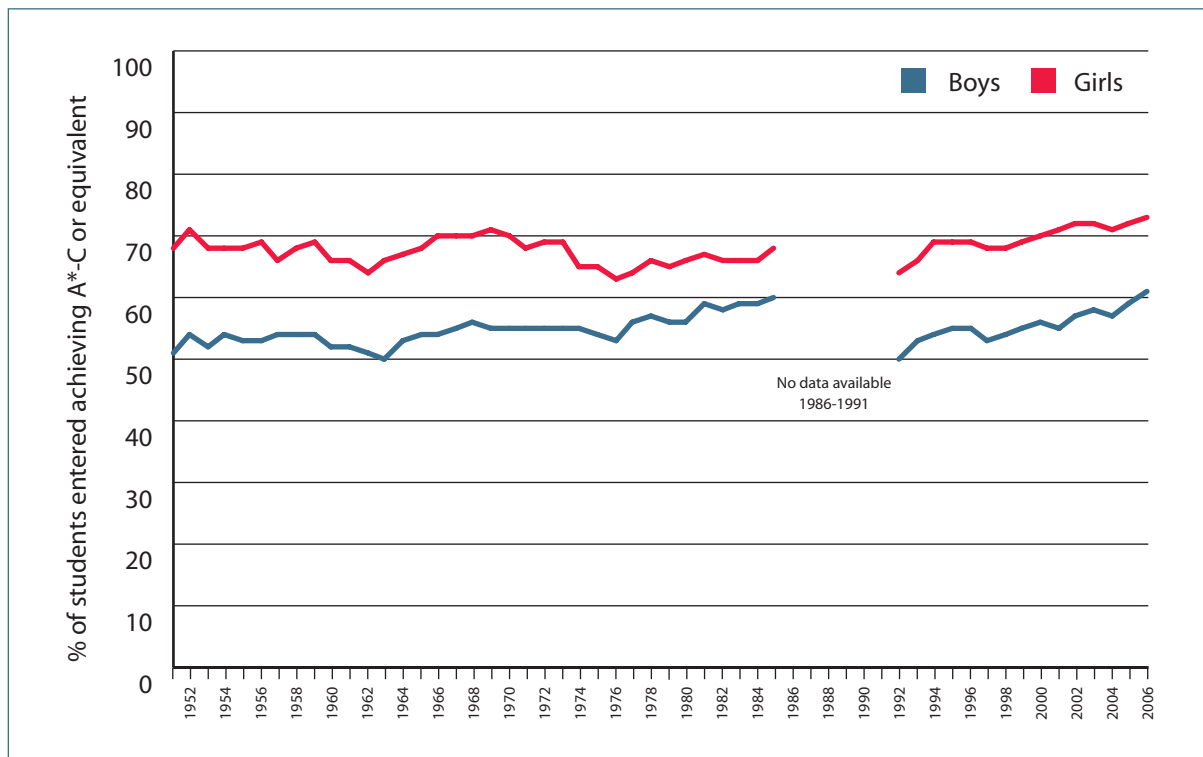
Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

In summary, for Biology, Physics and Chemistry the historical pattern has shown only a small gender differential (it has been larger in Biology at certain time points). The differential for Double Award Science is also relatively small, though has been gradually increasing. The main difference between the sexes was that boys were more likely than girls to take the separate sciences and, in particular, Physics.

3.5.6 English Literature O-Level/GCSE

There has been a large gender gap in girls' favour in English Literature over six decades. The gap was relatively smaller between the mid-70s and mid-80s (between 7–10 percentage points) but more recently has been between 13–15 percentage points (similar to the 1960s pattern).

Figure 3-17 English literature O-level/GCSE Time Series: Attainment by Gender (1951–2006)

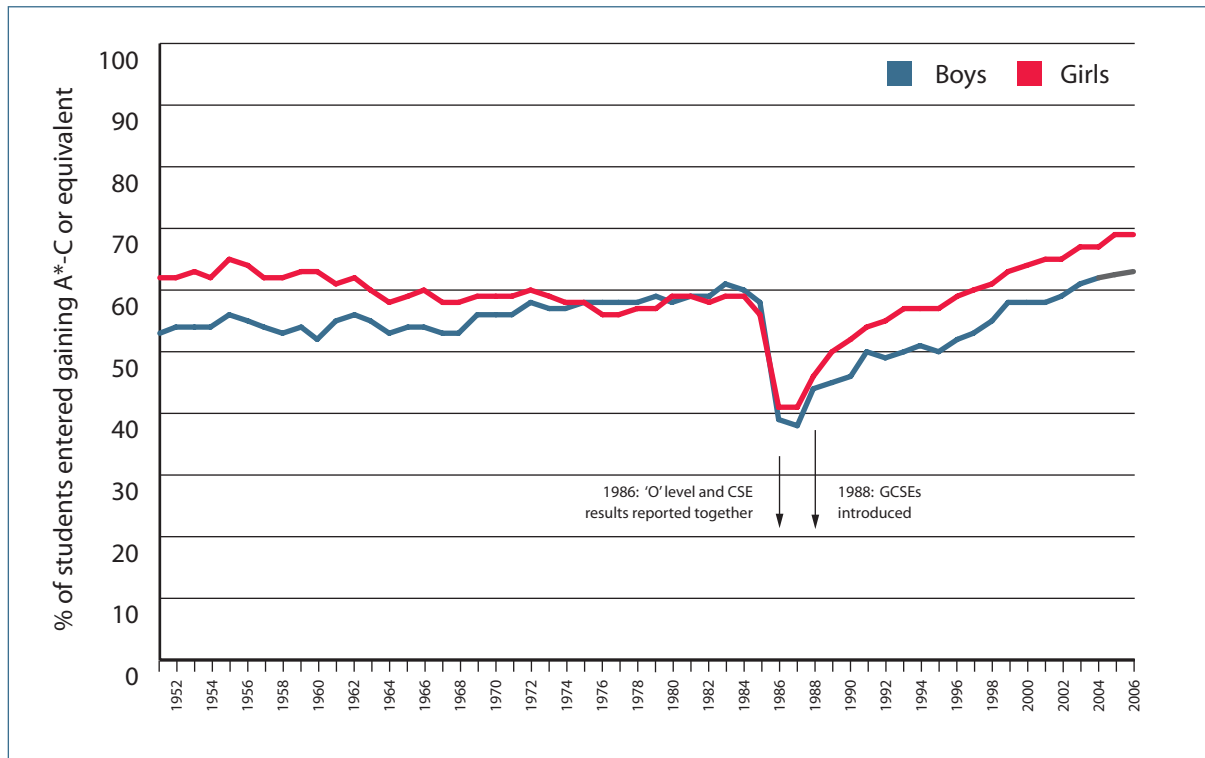


Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

3.5.7 History O-Level/GCSE

The pattern of attainment in History over the last decade and a half is similar to the pattern in the 1960s: girls doing significantly better than boys (5–7 percentage points better). The gap was larger still in the 1950s. Between 1975 and 1985, however, boys were doing slightly better than girls – this advantage then disappeared with a gradually increasing gap in favour of girls.

Figure 3-18 History O-level/GCSE Time Series: Attainment by Gender (1951–2006)

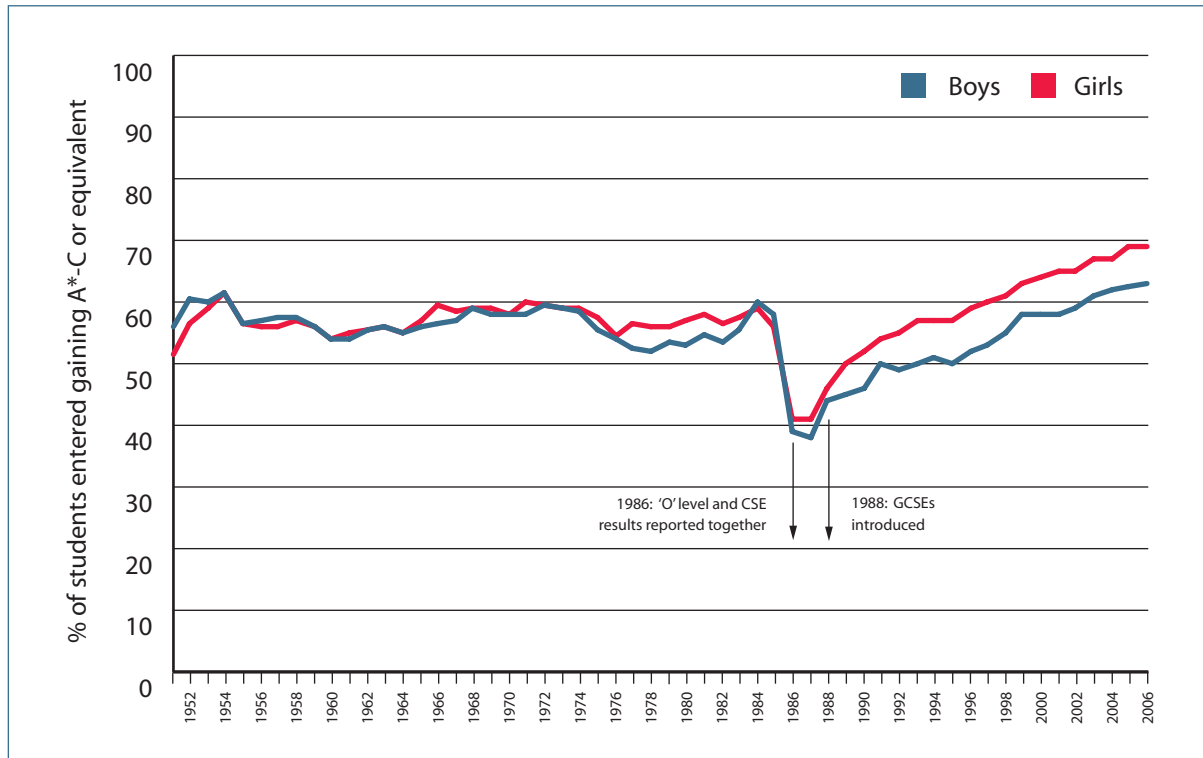


Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

3.5.8 Geography O-Level/GCSE

For most of the 1950s, boys performed slightly better than girls. From the 1960s to the mid-70s, there was a narrow attainment differential, with girls slightly ahead at times. From the mid-70s to the mid 80s, boys were doing slightly better. Since then, girls have been consistently ahead with gaps of 6–7 percentage points.

Figure 3-19 Geography O-level/GCSE Time Series: Attainment by Gender (1951–2006)

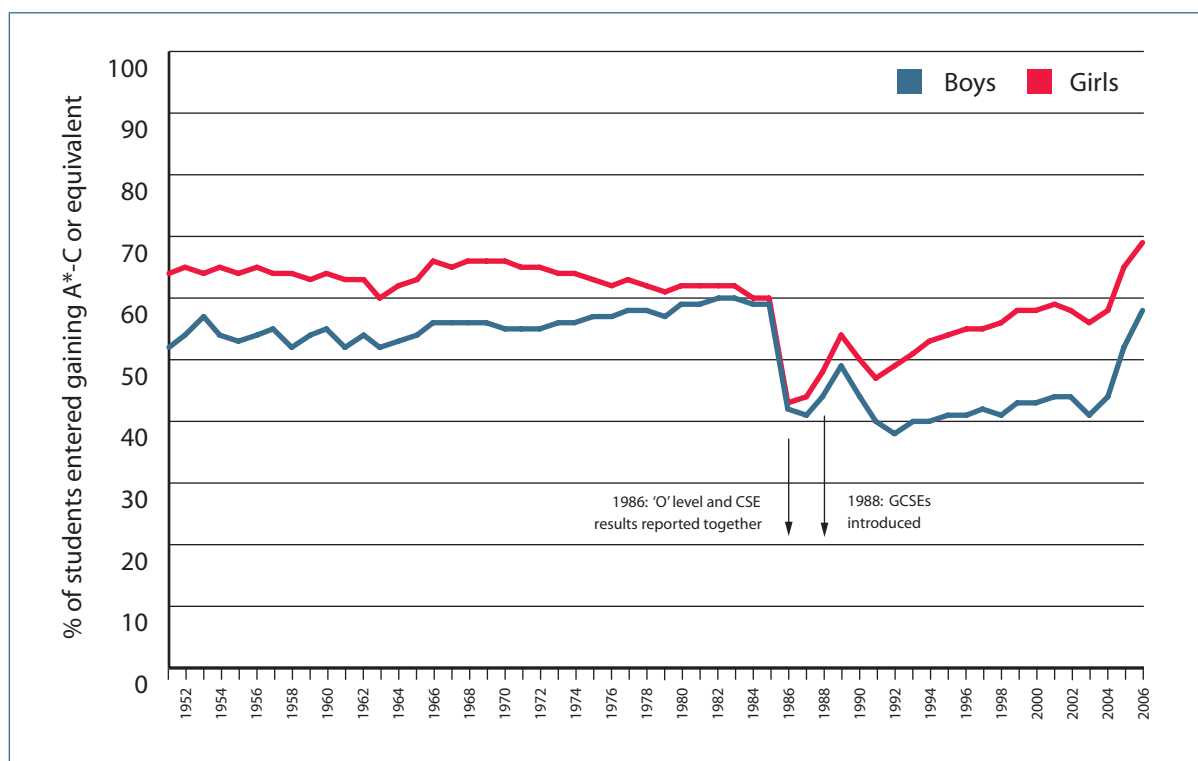


Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

3.5.9 French O-Level/GCSE

In French, girls have consistently performed better than boys. Apart from the mid-70s to mid-80s when the gap was relatively small, the gap has been substantial. In this decade, it has ranged from a 13–15 percentage points difference. While number of entries have decreased dramatically since modern foreign languages were made non-compulsory in 2004, the pass rate has increased significantly for both genders, presumably as the most able and motivated are most likely to choose the subject.

Figure 3-20 French O-level/GCSE Time Series: Attainment by Gender (1951–2006)

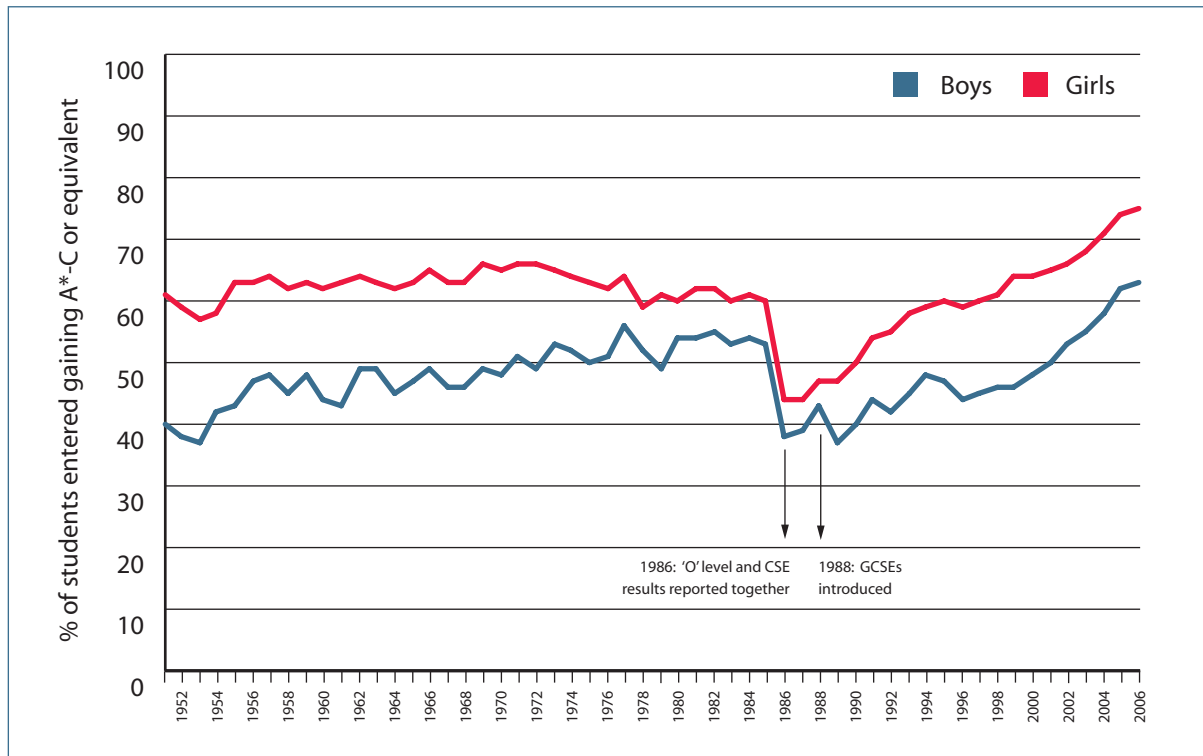


Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

3.5.10 Religious Studies O-Level/GCSE

The gender gap in Religious Studies, a subject more popular amongst girls (60/40 split on average), has been consistently large throughout the last sixty years, (indeed larger in the 1950s than now) with a slight narrowing in the late 70s and 80s, see Figure 3-21.

Figure 3-21 Religious Studies O-level/GCSE Time Series: Attainment by Gender (1951–2006)

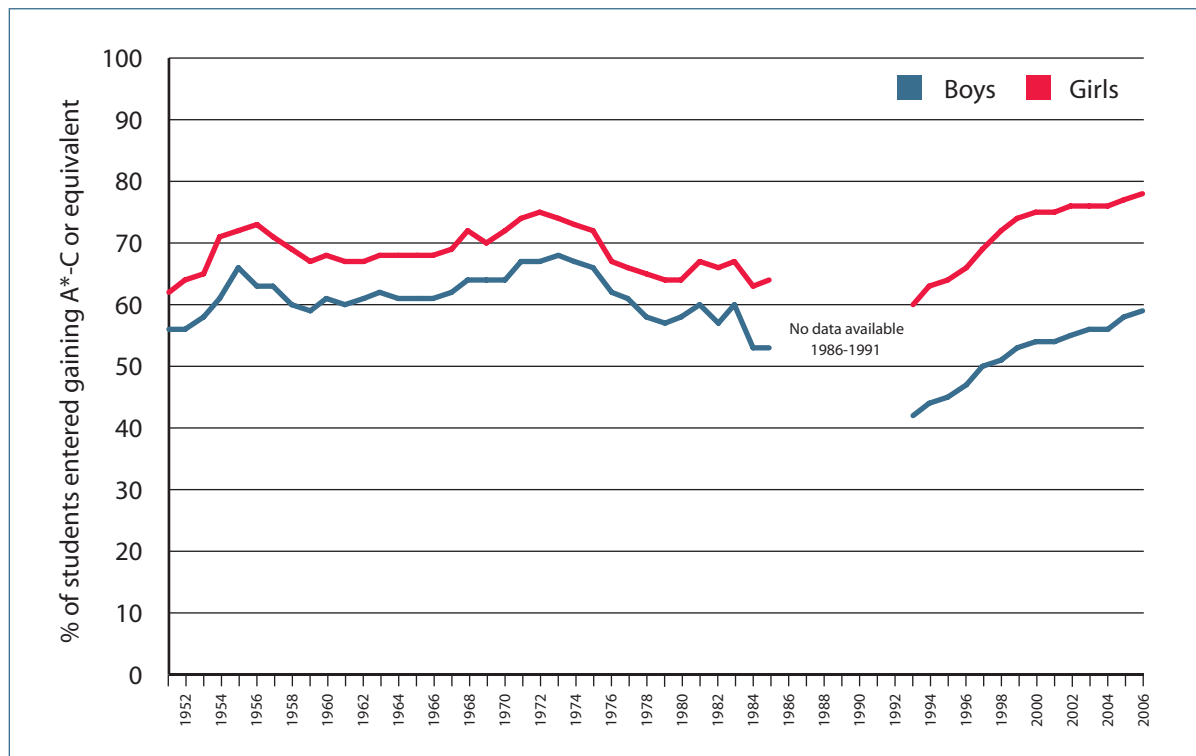


Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

3.5.11 Art and Design O-Level/GCSE

Art has consistently been a more popular subject with girls and the gender gap in attainment has been large: 18–21 percentage points since 1993.

Figure 3-22 Art and Design O-level/GCSE Time Series: Attainment by Gender (1951–2006)



Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

3.6 Gender Differences at GCSE at A* grade and G Grade

Girls are also more likely than boys to gain a top grade. Figure 3-23 shows that this is not the case in terms of the proportion of pupils gaining an A* at GCSE in 2006. With the exception of Economics (where boys are 5 percentage points ahead), Physics (3 percentage points ahead), Other Science subjects (9 percentage points ahead) and Italian (3 percentage points ahead), girls are more likely to gain an A* than boys. However, in most cases the difference is small.

It has also been noted that boys may be disproportionately likely to perform poorly. 6.5 percent of boys did not gain any GCSEs (2003 data¹¹) compared to 4.4 percent of girls. Figure 3-23 shows that boys are more likely than girls to gain a G grade in many subjects. However, the gap is mainly narrow.

¹¹ SFR 04/2004 National Curriculum Assessment and GCSE/GNVQ Attainment by Pupil Characteristics, in England, 2002 (final) and 2003 (provisional), issued February 2004.

Figure 3-23 Gender Differences at Top and Bottom Grades (2006)

Subjects	% point difference at Grade A* (girls-boys)	% point difference at Grade G (girls-boys)
SCIENCES		
Biological Science	3%	0%
Chemistry	2%	0%
Physics	-3%	0%
Single Award Science	0%	-1%
Double Award Science	1%	0%
Other Science	-9%	-4%
Mathematics	0%	-1%
Design and Technology and Electronics	5%	-3%
Design and Technology and Food Technology	4%	-2%
Design and Technology and Graphics	3%	-2%
Design and Technology and Resistant Materials Technology	4%	-2%
Design and Technology and Systems Control	9%	-3%
Design and Technology and Textiles Technology	6%	-6%
Other Design and Technology	4%	-1%
Information Technology	2%	-1%
Home Economics	3%	0%
SOCIAL SCIENCES		
Business Studies	1%	-1%
Geography	4%	0%
History	3%	-1%
Economics	-5%	0%
Humanities	1%	-3%
Social Studies	3%	-2%
Physical Education	3%	0%
Vocational Studies	2%	-1%
ARTS		
Art and Design	5%	-2%
English	2%	-2%
English Literature	2%	-1%
Drama	3%	-1%
Communication Studies	3%	-2%
Media/Film/Television Studies	3%	-4%
French	3%	-1%
German	2%	-1%
Spanish	3%	-2%
Italian	-3%	0%
Other Modern Languages	1%	-1%
Classical Studies	8%	-1%
Music	3%	-1%
Religious Studies	6%	-2%

Source: DFES unpublished provisional data

4 Public Examinations at Age 18

4.1 Introduction

This chapter explores gender differences at A-Level, looking at both subject choice and attainment data. It describes some very different patterns of subject choice and an attainment pattern that is less dramatic than that seen at GCSE.

4.2 Key Findings

A-Level Entries and Subject Choice

- Girls are more likely to stay on in full time education at age 16: 82 percent of girls and 72 percent of boys.
- Girls are now more likely to be entered for A-Levels than boys (54 percent of entries are female). This contrasts to the 1950s and 1960s when only a third of A-Level entries were female.
- Gender differences in subject choice are greater at A-Level than GCSE. Girls' most popular subject is English, while boys' is Maths. Psychology, Art and Design, Sociology and Media/Film/Television Studies are in the girls' top 10 choices, while Physics, Business Studies, Geography and Physical Education are in the boys' top 10.
- Girls' participation in Physics is particularly low and is the least popular of the three Sciences and accounts for only 1.3 percent of female entries. For boys, Physics remains the most popular science but whereas it used to be the most popular subject overall, it now is in 6th place and represents only 5.7 percent of entries.

A-Level Attainment

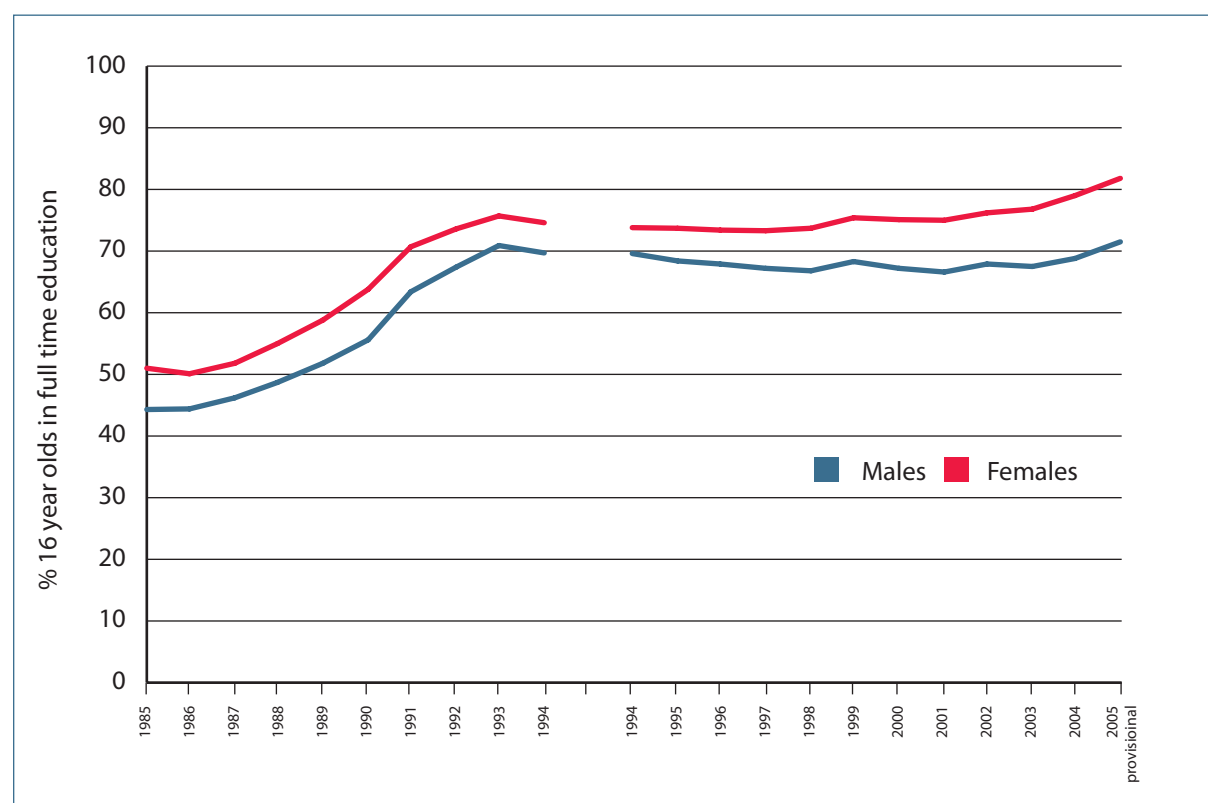
- Gender differences in pass rate are much narrower at A-Level than at GCSE. Across all subjects, the range of difference is 4 percentage points. This is in the context of a very high pass rate.
- Girls perform better than boys in terms of those attaining an A grade (for the majority of subjects). This is a significant change over the last ten years.

4.3 Post-16 Participation Rates

Before discussing gender differences in A-Level subjects, this section examines post-16 participation rates in full time education. The majority of girls and boys stay on in full time education: 82 percent of girls and 72 percent of boys stay on after the age of 16. While girls have been more likely to stay on at 16 in full time education, the overall rates have changed

hugely over the last 20 years: in 1985, 51 percent of girls and 44 percent of boys continued in full time education. The gap between girls and boys has widened slightly from 7 percentage points in 1985 to 10 percentage points in 2005, see Figure 4-1.

Figure 4-1 Percentage of 16 year olds in Full Time Education by Gender (1985–2005)



Note: The break in time series in 1994 is due to changes in the source of further and higher education data

Source: SFR 21/2006 Participation in Education, Training and Employment by 16-18 Year Olds in England: 2004 and 2005, issued June 2006

4.3.1 A-Level Entries

Historically, a more pronounced gender disparity existed in the proportion of boys and girls taking A-Levels than is the case today. In the 1950s and 1960s, girls represented approximately a third of A-Level entries. Since the 1990s, the pattern has reversed with girls now slightly more likely to be entered for A-Levels (1996: 52 percent of entries were female; 2006: 54 percent of entries were female).

4.3.2 A-Level Subject Choice

The most popular A-Level subject for girls by a large margin is English, with the next most popular being Psychology and General Studies. For boys, Maths is the most popular, followed by General Studies and English.

In 2006 (see Figure 4-2), six out of the 10 most popular A-Level subjects are the same for boys and girls:

- Maths, History, English, Biological Sciences, General Studies, Chemistry.

The subjects where boys and girls' top 10 differed were:

- Psychology, Art and Design, Sociology and Media/Film/Television Studies (girls' top 10); Physics, Business Studies, Geography and Physical Education (boys' top 10).

Figure 4-2 Ten Most Popular A-Levels by Gender (in Rank Order) Over the Last 60 Years

Rank	1956		1966		1976		1985		1996		2006	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
1	Physics	English Literature	Physics	English Literature	Physics	English	Pure & Applied Maths	English	Maths	English	Maths	English
2	Maths	French	Chemistry	French	Pure & Applied Maths	History	Physics	Biology	General Studies	Social Studies	General Studies	Psychology
3	Chemistry	History	Pure & Applied Maths	History	Economics	French	Chemistry	General Studies	English	General Studies	English	General Studies
4	English Literature	Geography	English Literature	Geography	Chemistry	Biology	Economics	Pure & Applied Maths	Social Studies	Biological Studies	History	Biological Sciences
5	History	Chemistry	History	Art	English	Geography	General Studies	History	Physics	Maths	Biological Sciences	Art and Design
6	French	Physics	Geography	Chemistry	Geography	Art	Geography	Chemistry	Geography	History	Physics	History
7	Geography	Latin	Economics	Physics	General Studies	General Studies	English	Art	Chemistry	Art & Design	Business Studies	Maths
8	Applied Maths & Mechanics	Maths	Pure Maths	Biology	History	Chemistry	Biology	French	Biological Sciences	Geography	Chemistry	Sociology
9	Latin	Zoology	French	German	Biology	Sociology	History	Economics	History	French	Geography	Chemistry
10	Biology	Art	Applied Maths	Religious Knowledge	Pure Maths	Economics	Art	Geography	Business Studies	Chemistry	Physical Education	Media/Film/Television Studies

Note: Shaded areas indicate subjects which are only in top 10 for one of the genders for one particular year *1985 rather than 1986 chosen as full subject data is not available for 1986

Source: Department for Education's Statistics of Education. See 'Notes on Time series Charts and Tables' for further information

The gender differences in subject choice seem to be greater at A-Level compared to GCSE possibly because there is less constraint in the subjects one can choose. As students must select a smaller number of subjects than at GCSE, and none are compulsory, the gender differences affecting subject preferences and choice become more apparent. Of particular note, is the female preference for the social sciences at A-Level, which is a recent phenomenon.

4.3.3 Girls' Participation in Science at A-Level

Historically, there has been concern over girls' participation in the Sciences (both at school and in higher education and beyond). An examination of the data shows that it is participation in Physics that is particularly low. Over the last ten years, Physics has consistently remained the least popular Science at A-Level for girls. Indeed, it hasn't featured in girls' top 10 A-Level subject choices since the 1960s. In 2006, only 4,970 girls (1.4 percent of female entries) were entered for Physics compared to 18,867 boys (5.4 percent of male entries). Taking total number of entries (boys and girls), physics is now the least popular of the three sciences at A-Level amongst pupils.

To put the figure of 4,970 female entries for Physics in context, over 54,000 girls were entered for English A-Level in 2006, their most popular choice. Biology was the fourth most popular subject for girls (27,000 entrants). Across all subjects for boys, Physics was the sixth most popular A-Level (after Maths, General Studies, English, History and Biology).

It is also worth noting that the popularity of Physics has declined steeply for boys. From 1961-1977, Physics was not only the most popular Science subject amongst boys, but the most popular of any A-Level subject. The average number of male entries in the 1960s was 34,000 or 15 percent of entries. In the late 1970s, Pure and Applied Maths became boys' most frequently taken A-Level but this was due to a rise in entries in Maths rather than a decline in entries for Physics. In 2006, for the first time, Biology – not Physics – was the most popular Science for boys by a small margin.

Figure 4-3 Percentage of Students Entered for A-Level Sciences in Schools and Colleges by Gender (1996–2006)

	Physics		Chemistry		Biology	
	% of total A-level entries Female	% of total A-level entries Male	% of total A-level entries Female	% of total A-level entries Male	% of total A-level entries Female	% of total A-level entries Male
1996	1.8	7.6	4.7	6.6	7.9	6.0
1997	1.8	7.2	4.6	6.5	8.1	6.2
1998	1.8	7.2	4.7	6.3	8.0	6.2
1999	1.9	7.2	4.7	6.0	7.9	5.8
2000	1.8	7.0	4.7	5.8	7.9	5.7
2001	1.7	6.9	4.6	5.4	7.6	5.3
2002	1.8	7.2	4.7	5.3	8.1	5.8
2003	1.7	6.7	4.5	4.9	7.5	5.6
2004	1.5	6.2	4.5	5.1	7.3	5.6
2005	1.4	6.0	4.4	5.3	7.2	5.9
2006	1.3	5.7	4.3	5.4	7.1	5.9

Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

Figure 4-4 Numbers of Students Entered for A-Level Sciences by Gender (2006)

	Total Entries 2006		
	Female	Male	Total
Physics	4,970	18,687	23,657
Chemistry	16,814	17,720	34,534
Biology	27,324	19,300	46,624

Source: SFR02/2007 GCE/VCE A/AS and Equivalent Examination Results in England, 2005/06 (Revised), issued January 2007

Even where students pass Physics A-Level and enter higher education through UCAS, the degree choices they subsequently make are also marked by gender differences as shown in Figure 4-5 (Smithers and Robinson, 2006¹²). Female students are more likely to use their Physics A-Level as an entry qualification to Medicine and Dentistry or a Physical Science. In contrast, male students are more likely to opt for Engineering and Technology, and Maths and Computing Sciences.

Figure 4-5 University Subject Areas Chosen by Students with A-Level Physics by Gender

Subject Area	% Male	% Female	% All
Engineering & Technology	29.2	12.1	25.2
Maths & Computing Sciences	18.1	8.9	16
Total Physical Sciences (Physics, Physics Combinations, Other Physical Sciences)	17.4	18.1	17.6
Medicine and Dentistry	8.2	23.9	11.8
Combinations	8.2	9.2	8.4
Social Studies	4.2	3.8	4.1
Biological Sciences	3.9	9.3	5.2
Business & Administration	3.4	2.7	3.3
Architecture, Building & Planning	2.4	2.3	2.4
Other	2.3	4	2.7
Creative Arts & Design	2	2.2	2
Veterinary Science & Agriculture	0.6	3.4	1.2
Mean N 1996-2005	21,096	6,381	27,477

Source: Smithers and Robinson, 2006

A recent literature review by Murphy and Whitelegg (2006)¹³ commissioned by the Institute of Physics described the reasons why girls choose not to study Physics at A-Level.

There are gender differences in what students consider personally relevant to them and these perceptions influence subject choice and how students engage with learning and assessment situations. Girls are more likely to value the social context in which tasks are placed in defining a problem; boys are less likely to notice the context. Typical secondary physics activities tend not to be concerned with the social context at all. Some girls experience physics as increasingly difficult as they struggle to engage with it.

¹² Smithers, A. & Robinson, P. (2006). *The paradox of single-sex and co-educational schooling*. University of Buckingham.

¹³ Murphy, P. & Whitelegg, E. (2006) *Girls in the Physics Classroom: A Review of the Research on the Participation of Girls in Physics*, Institute of Physics.

Students need to feel that they are successful at a particular subject in order to continue their studies and there is evidence that males are more likely than females to rate themselves as successful learners in maths and science. Students' perception of physics' difficulty is linked to the mathematical demands of the subject, another subject that girls are less likely to rate themselves as successful at.

Murphy and Whitelegg refer to studies that have shown that physics and other sciences are measured to be up to a whole grade more difficult compared with most other subjects at A-Level and GCSE. These findings have been challenged, but there is still a perception of physics as a difficult subject, which may act as a deterrent, particularly to girls. Students were also found to lack knowledge of the range of science-related careers, which could influence their choices at A-Level, linking back to the finding that students, especially girls, need to see the relevance of what they study.

The key determinants of students' positive attitudes to physics are:

- That students understand how the subject relates to themselves, both now and in the future: their "physics self-concept".
- Their experience of school physics is a positive one.
- That they have a personally supportive physics teacher.

The report describes the need for curriculum change and change in the teaching and assessment of physics in order to engage girls better. The curriculum should be "context based" or "humanistic". It should:

- Use a variety of social situations and contexts to organise and determine the scientific content of the course.
- Represent science as something that people do, influenced by historical, political, cultural and personal factors, not just as a body of knowledge.
- Use values inherent in science as topics for discussion and critique.

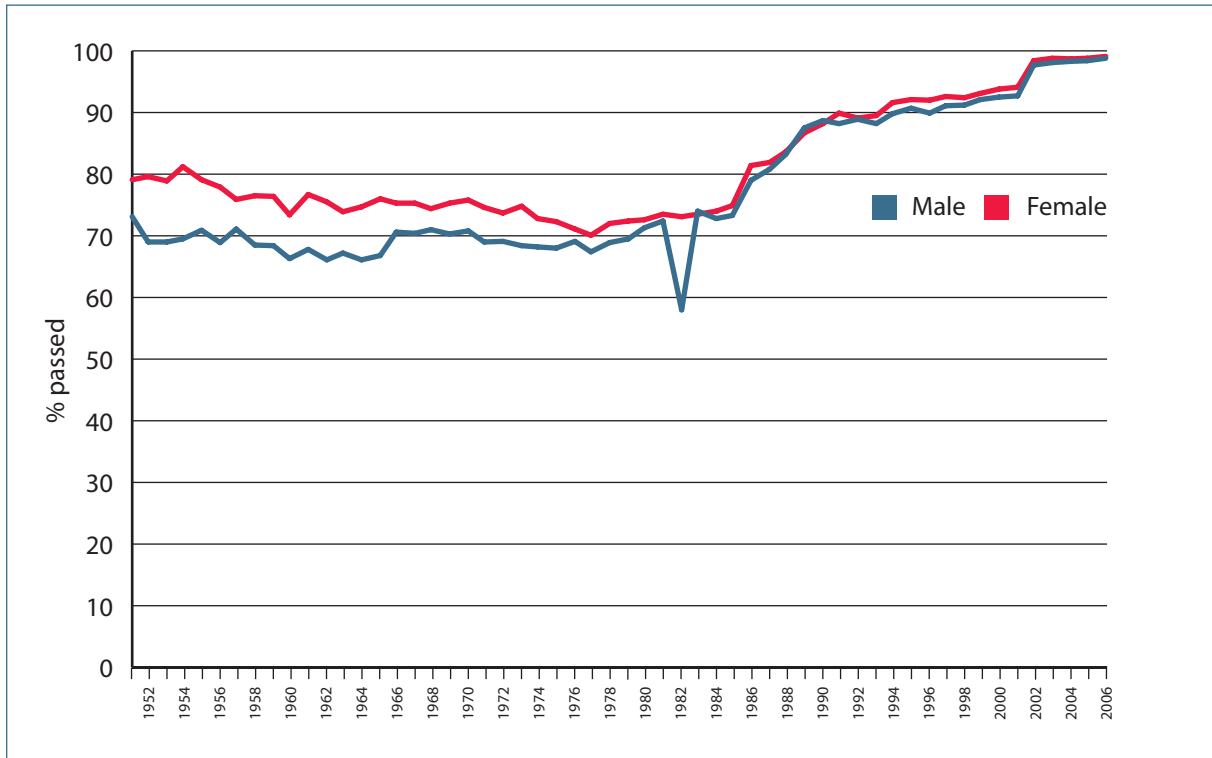
This approach relies on more use of discussion, debate and student collaboration in learning. This requires a change in the teacher-student relationship to the teacher being a "knowledgeable guide". There is some evidence that this approach leads to increased enjoyment, achievement and participation levels, though some students, particularly boys, see little value on a focus on social contexts and problems.

Where students have a less positive self-concept, a teacher's support is of extra importance, and this is the case for girls and boys.

4.4 Historical A-Level Attainment in English and Maths

Time series data for pass rates for English and Maths show a different pattern of attainment (in pass rate) at A-Level than O-Level/GCSE. In English, girls have performed better than boys, but the size of the gap has fluctuated and is now currently very narrow (unlike at O-Level/GCSE where the gap has been wide and growing). In Maths, girls have also been ahead of boys (unlike at O-Level where boys were ahead) but the gap has narrowed and is now negligible.

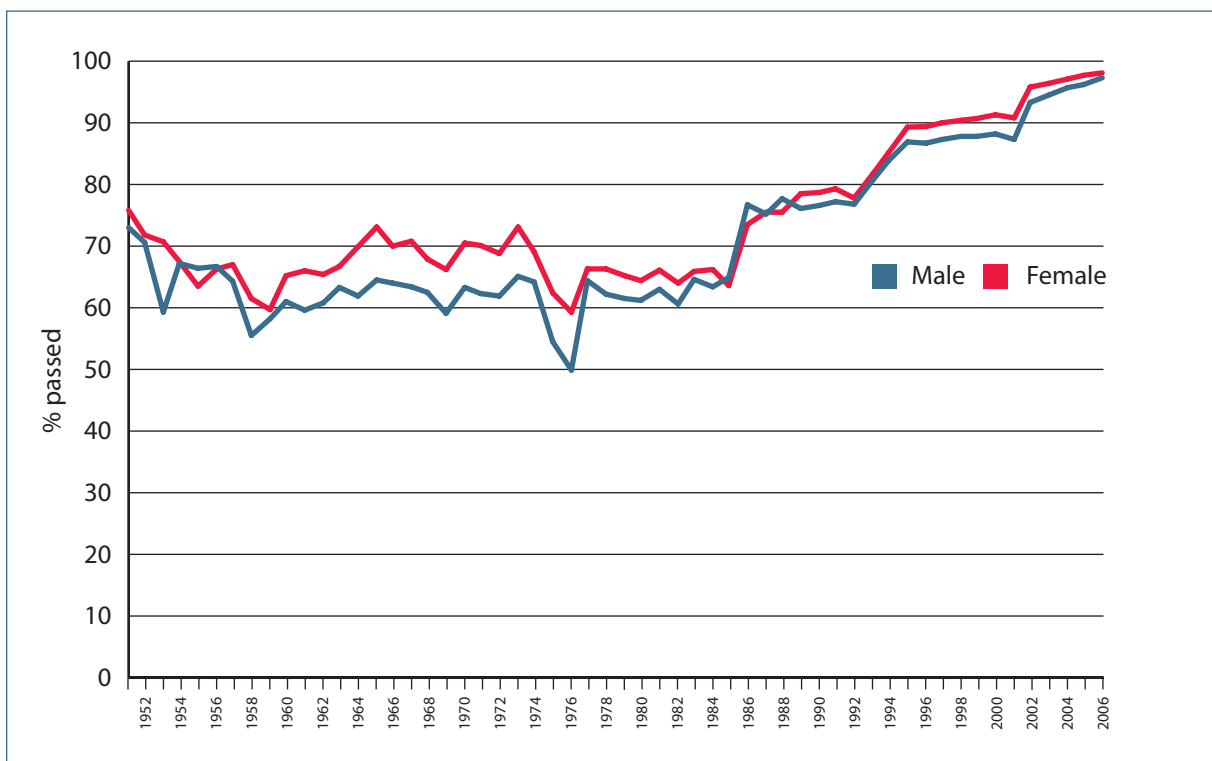
Figure 4-6 English A-Level Time Series: Attainment by Gender (1951–2006)



Note: 2006 data are revised figures

Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

Figure 4-7 Maths A-Level Time Series: Attainment by Gender (Pure Maths 1951–2006)



Note: 2006 data are revised figures

Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

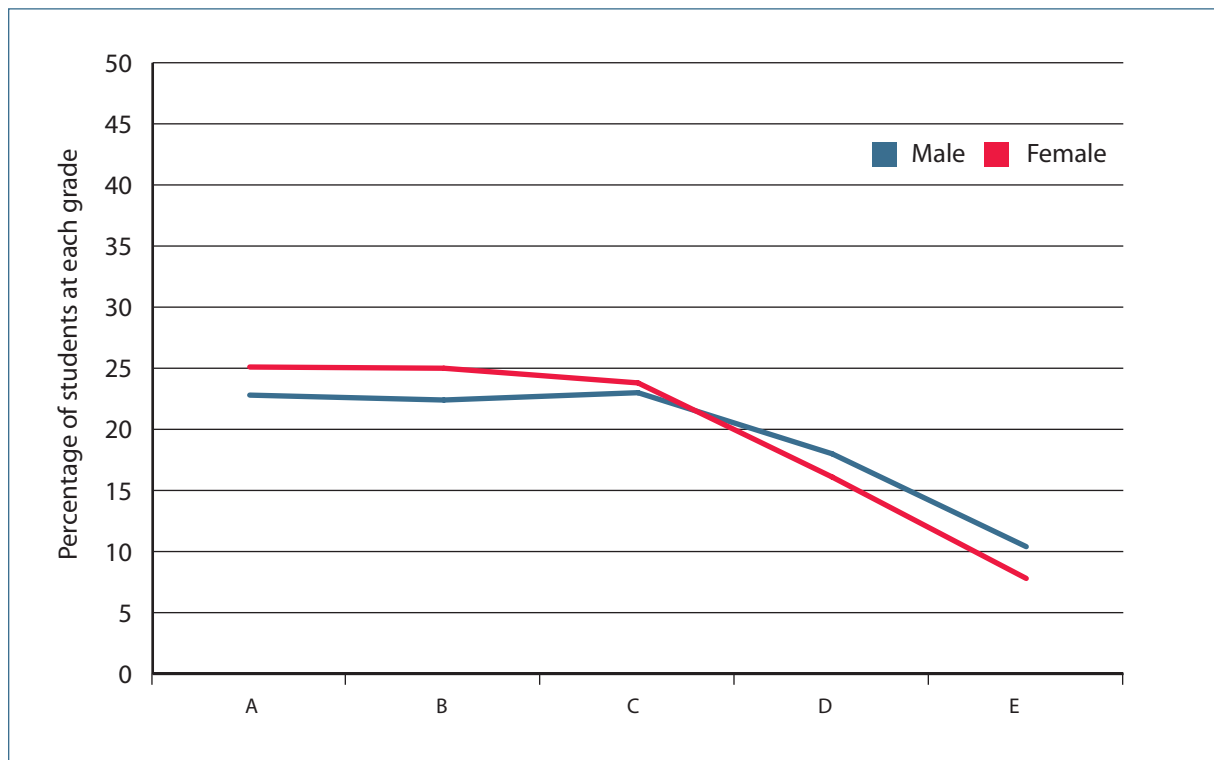
4.5 A-Level Attainment across Subjects

The overall pass rate (i.e. achieving grade A-E) has, in recent years, been extremely high: since 2002, the pass rate has been 95 percent or above in the majority of subjects.

Gender differences in the pass rate are much narrower at A-Level than GCSE. Across all subjects, the range of difference is 4 percentage points but in the subjects where girls do much better than boys at GCSE, gender differences at A-Level are much narrower or non-existent (English, French, History, Geography). Figure 4-12 shows the slightly larger percentage of girls achieving 2 or 3 A-Level passes in 2006.

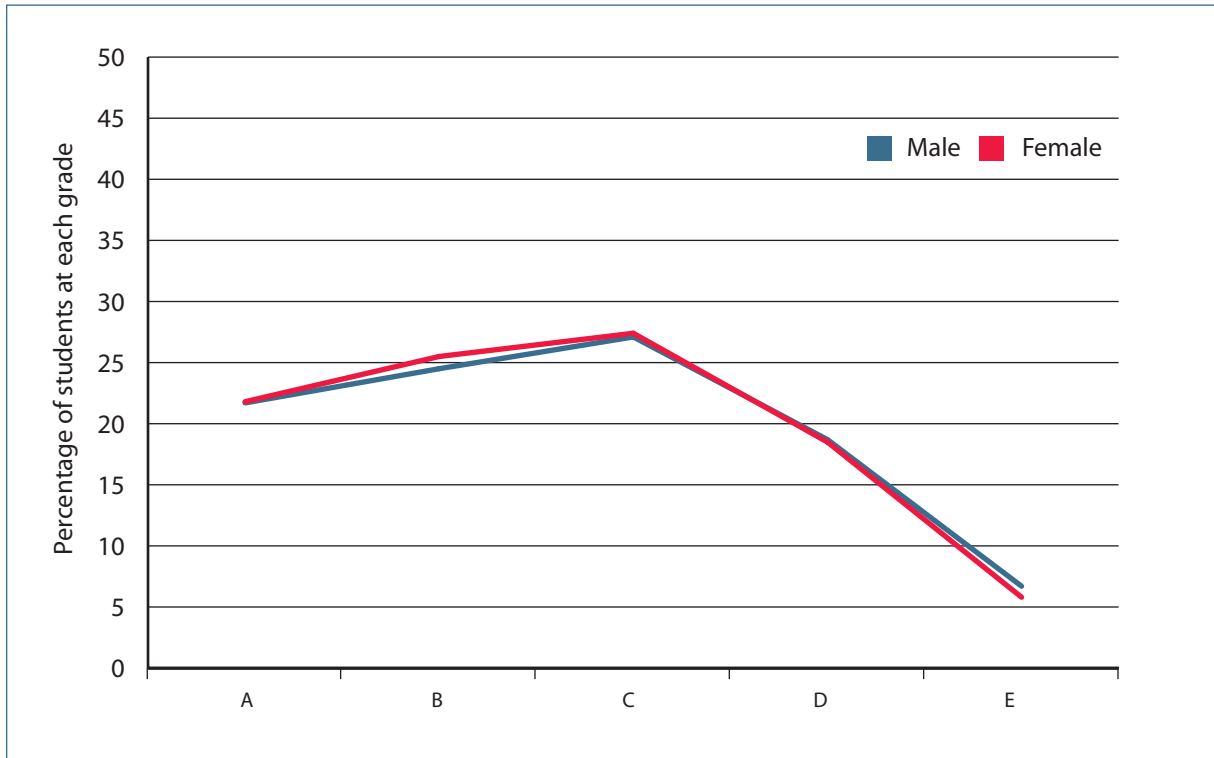
Figures 4-8, 4-9 and 4-10 show the grade distribution across all subjects and in English and Maths. In English, there are virtually no differences between boys and girls in the grade distribution. In Maths, girls perform better, on average, at the higher grades. Attainment at Grade A is discussed in more detail in the next section.

Figure 4-8 A level Grade Distribution: All Subjects by Gender (2006)



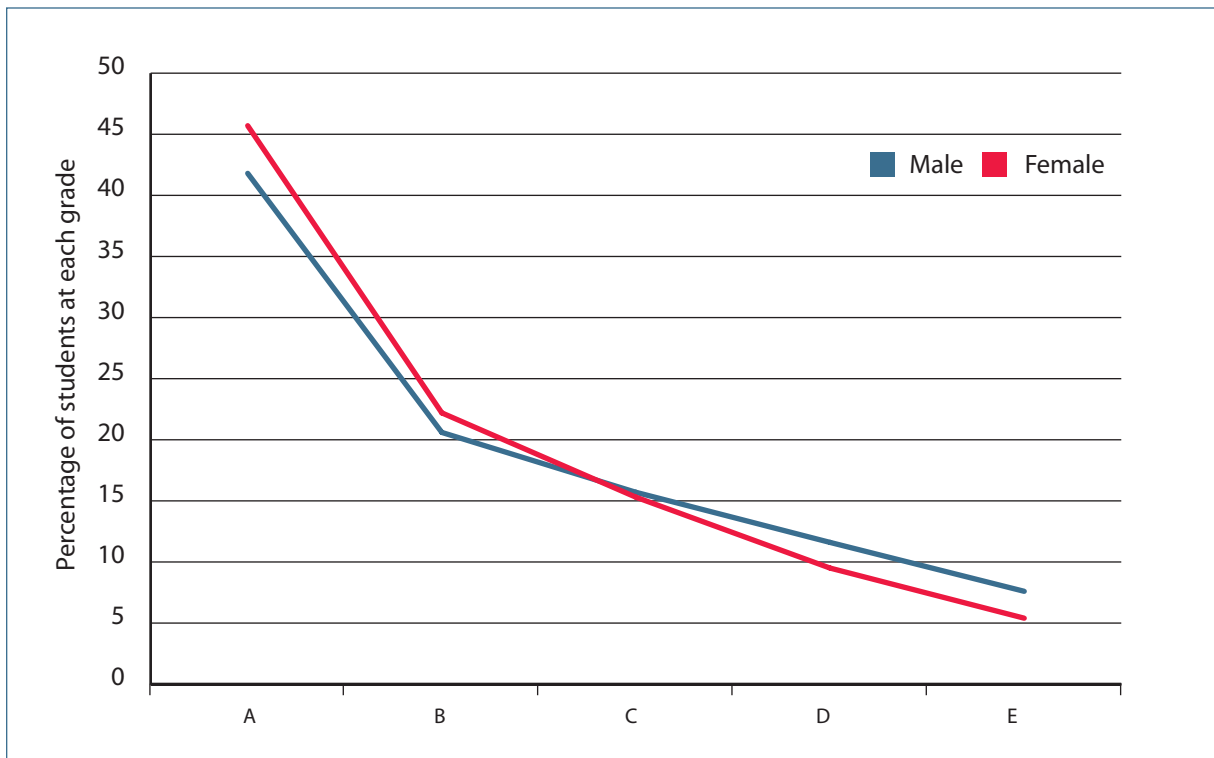
Source: SFR02/2007 GCE/VCE A/AS and Equivalent Examination Results in England, 2005/06 (Revised), issued January 2007

Figure 4-9 A level Grade Distribution: English by Gender (2006)



Source: SFR02/2007 GCE/VCE A/AS and Equivalent Examination Results in England, 2005/06 (Revised), issued January 2007

Figure 4-10 A level Grade Distribution: Maths by Gender (2006)



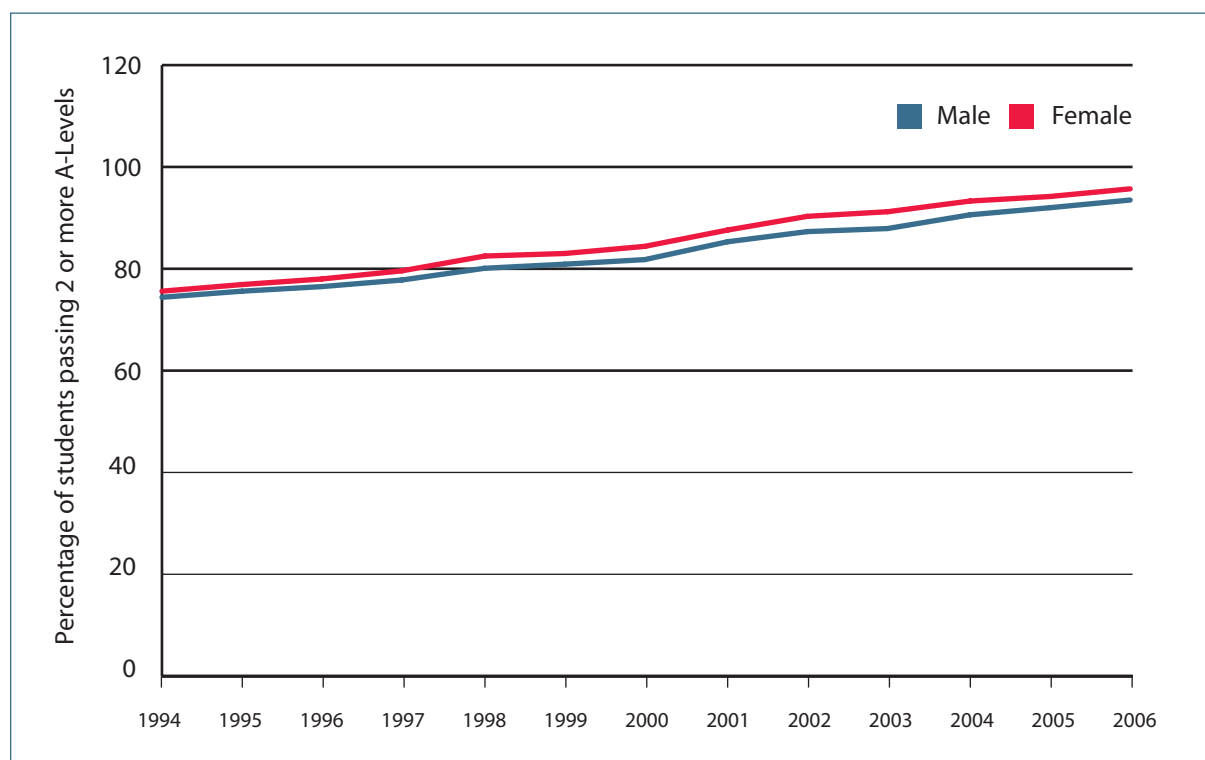
Source: SFR02/2007 GCE/VCE A/AS and Equivalent Examination Results in England, 2005/06 (Revised), issued January 2007

Figure 4-11 A-Level Pass Rate by Subject and Gender, 2006 (Ranked by Gender Gap)

	Male	Female	Gender Gap
ICT	93.2	96.1	2.8
Psychology	94.3	96.9	2.6
General Studies	91.5	93.8	2.2
Music	96.1	98.2	2.1
Physics	95.3	97.3	1.9
Design and Technology	96.7	98.5	1.8
Physical Education	96.2	97.8	1.6
Accounting and Finance	92.7	94.3	1.6
Other Science	96.3	97.6	1.3
Chemistry	96.5	97.5	1.1
Art and Design	97.2	98.2	1.0
Sociology	97.0	98.0	0.9
Law	95.1	96.0	0.9
Biological Sciences	95.2	96.0	0.9
Media/Film/Television Studies	98.4	99.3	0.8
Mathematics	97.3	98.1	0.8
Drama	98.7	99.4	0.7
Geography	98.5	99.2	0.7
Computer Studies	94.3	95.0	0.6
Further Mathematics	98.7	99.3	0.6
Economics	98.8	99.3	0.6
History	98.0	98.5	0.5
Religious Studies	98.5	98.9	0.4
Other modern languages	96.5	96.8	0.3
Spanish	98.8	99.1	0.3
Other Communication Studies	98.8	99.1	0.3
English	98.8	99.1	0.3
Business Studies	98.1	98.2	0.2
Classical Studies	99.1	99.2	0.2
Government and Politics	98.3	98.4	0.1
German	98.6	98.6	0.1
French	98.9	99.0	0.0
Other social studies	97.3	96.2	-1.1
Home Economics	100.0	98.5	-1.5

Source: SFR02/2007: GCE/VCE A/AS and Equivalent Examination Results in England, 2005/06 (Revised), issued January 2007

Figure 4-12 Percentage of 16–18 year Old Candidates Achieving Two or More GCE/VCE A-Level Passes by Gender (1994-2006)



Source: Department for Education's Statistics of Education. See 'Notes on Time Series Charts and Tables' for further information

4.6 Attainment at Grade A and Grade E

Girls perform better than boys in terms of percentage of those attaining an A grade at A-Level in the majority of subjects (see Figure 4-14). This represents a significant change over the last ten years (see Figure 4-13).

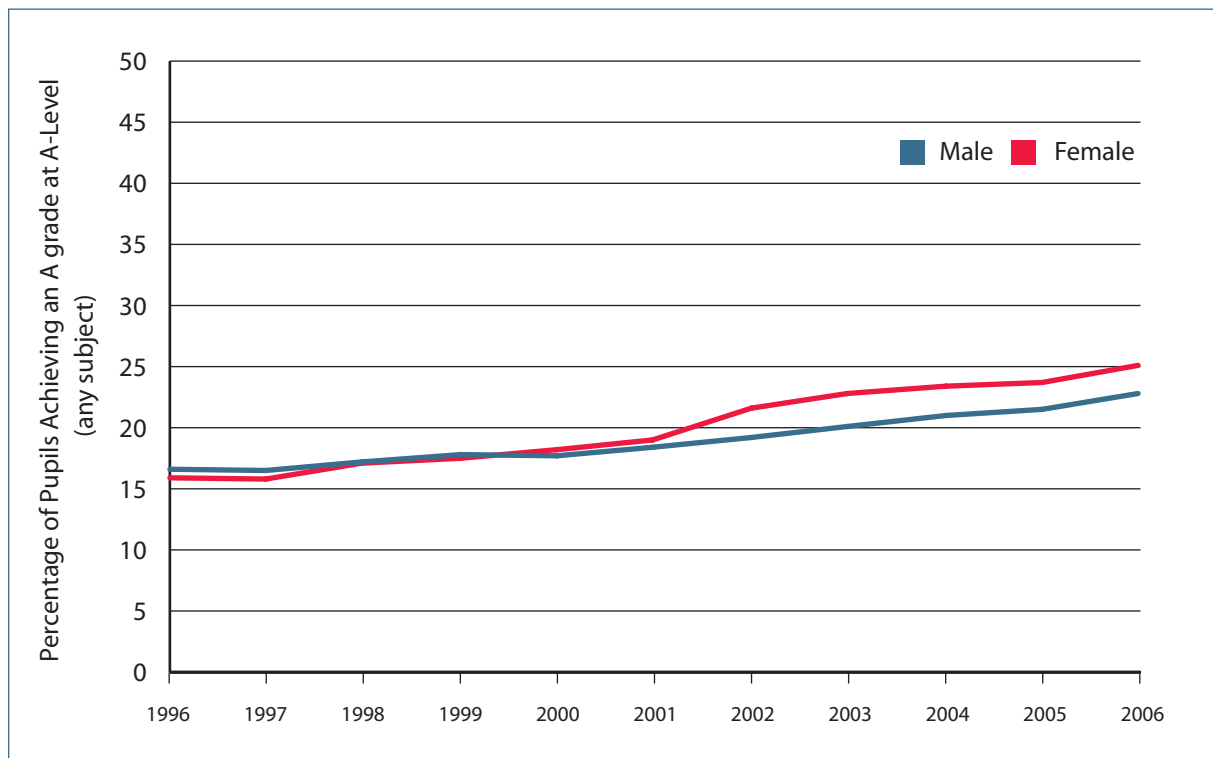
Girls' achievement at the highest grade is a recent phenomenon. In Physics, the seven percentage point difference represents an important change from ten years ago when boys and girls gained a similar proportion of A grades. Similarly, in Maths, the gap has opened up in the last ten years.

However, there are some important exceptions: there are 4 subjects where boys are more likely to get an A grade: Spanish, French, German and Other Science.

It is worth noting that there seems to be a relationship between subject choice and attainment. With subjects that are traditionally less popular among boys (Modern Foreign Languages), boys demonstrate higher levels of attainment than girls. The same is true of girls (e.g. Physics which is not popular amongst girls). It seems that pupils who choose a subject not popular with their gender are likely to achieve highly, presumably because only the most able pupils put themselves forward in a subject not traditionally popular with their gender.

In terms of passes at Grade E, boys are more likely than girls across most subjects to gain the lowest pass rate.

Figure 4-13 Percentage of Pupils Achieving an A-Grade at A-level by Gender (1996–2006)



SFR40/2006: GCE/VCE A/AS and Equivalent Examination Results in England, 2005/06 (Provisional), issued October 2006

SFR02/2007: GCE/VCE A/AS and Equivalent Examination Results in England, 2005/06 (Revised), issued January 2007

Figure 4-14 A-Level Attainment at Grade A by Subject and Gender (2006) Ranked by Gender Gap

	Male	Female	Gender Gap
Physical Education	10.3	20.6	10.3
Geography	21.8	31.2	9.4
Other modern languages	40.6	49.7	9.2
Psychology	11.7	20.5	8.8
Physics	28.2	36.0	7.8
Government and Politics	28.8	36.0	7.2
Drama	14.2	21.3	7.2
Design and Technology	14.0	21.1	7.1
Art and Design	24.6	30.9	6.2
Music	15.1	20.8	5.7
Economics	34.0	39.4	5.3
Sociology	16.7	22.0	5.3
Media/Film/Television Studies	10.3	15.1	4.8
Classical Studies	35.8	40.6	4.7
Law	17.3	21.8	4.5
History	22.4	26.4	4.0
Mathematics	41.8	45.7	4.0
ICT	6.3	10.0	3.7
Other Communication Studies	13.3	16.7	3.5
Accounting and Finance	10.4	13.8	3.4
Business Studies	15.6	19.0	3.4
Other social studies	19.8	22.9	3.1
Biological Sciences	23.3	25.6	2.3
Religious Studies	25.6	27.7	2.2
Chemistry	30.6	32.7	2.1
Computer Studies	15.6	17.2	1.6
Further Mathematics	57.5	58.3	0.8
General Studies	11.8	12.1	0.3
English	21.7	21.8	0.1
Other Science	23.7	21.1	-2.6
French	36.8	33.7	-3.1
German	41.2	35.1	-6.1
Spanish	41.8	35.0	-6.8

Source: SFR02/2007: GCE/VCE A/AS and Equivalent Examination Results in England, 2005/06 (Revised), issued January 2007

**Figure 4-15 A-Level Attainment at Grade E by Subject and Gender (2006)
Ranked by Gender Gap**

	Male	Female	Gender Gap
Spanish	3.1	4.4	1.3
German	4.7	5.6	0.9
French	5.2	5.7	0.5
Other Communication Studies	4.1	4.6	0.5
Other modern languages	2.5	2.7	0.2
Further Mathematics	3.5	3.6	0.1
Accounting and Finance	16.9	16.4	-0.5
Government and Politics	5.8	5.0	-0.8
Business Studies	8.9	8.0	-0.9
English	6.7	5.8	-0.9
Other social studies	9.1	8.0	-1.1
History	7.8	6.5	-1.3
Other Science	13.8	12.4	-1.4
Religious Studies	6.4	4.9	-1.6
Biological Sciences	12.9	11.3	-1.6
General Studies	18.6	16.9	-1.7
Chemistry	9.5	7.7	-1.7
Classical Studies	3.9	2.0	-1.9
Economics	5.5	3.6	-1.9
Mathematics	7.6	5.4	-2.2
Geography	8.0	5.0	-3.0
Media/Film/Television Studies	7.7	4.7	-3.0
Drama	6.1	3.0	-3.0
Physics	11.9	8.8	-3.1
Law	12.8	9.4	-3.4
Sociology	10.0	6.6	-3.5
Art and Design	8.7	5.1	-3.6
Music	13.3	9.3	-4.0
Design and Technology	11.6	7.2	-4.4
Computer Studies	15.6	10.8	-4.7
Psychology	15.3	9.6	-5.7
ICT	20.7	14.5	-6.2
Physical Education	15.8	9.6	-6.3
Home Economics	27.9	13.4	-14.5

Source: SFR02/2007: GCE/VCE A/AS and Equivalent Examination Results in England, 2005/06 (Revised), issued January 2007

5 National Curriculum Assessments

5.1 Introduction

This chapter looks at Key Stage data to examine how gender differences emerge from an early age. The findings reported in previous chapters on GCSE and A-Level are incorporated here to describe the pattern of performance in the core subjects of English, Maths and Science from Reception Year to Sixth Form.

5.2 Key Findings

- Girls perform consistently better than boys across all 13 scales of the Foundation Stage Profile, with the largest differences in literacy measures, creative development and emotional development, and the smallest differences on the maths scales.
- The gender gap in English is apparent from the Foundation Stage through to GCSE. The gender gap is largest at Key Stages 3 and 4.
- The gender gap in Maths is smaller than English across Key Stages but girls are performing better than boys at Foundation Stage, and at Key Stages 1, 3 and 4.
- Gender differences in Science are relatively small.
- Taking account of prior attainment and other factors, there is only a small difference between boys' and girls' progress at primary school, but a larger difference at secondary school (equivalent to two grades' progress).

5.3 Foundation Stage Profile

This section describes results from The Foundation Stage curriculum which covers children's physical, intellectual, emotional and social development at the end of the Reception Year (age 5)¹⁴. This is of particular interest as it covers a wider range of skills than the usual core subjects of English, Maths and Science of the Key Stages.

The scales are divided into six areas:

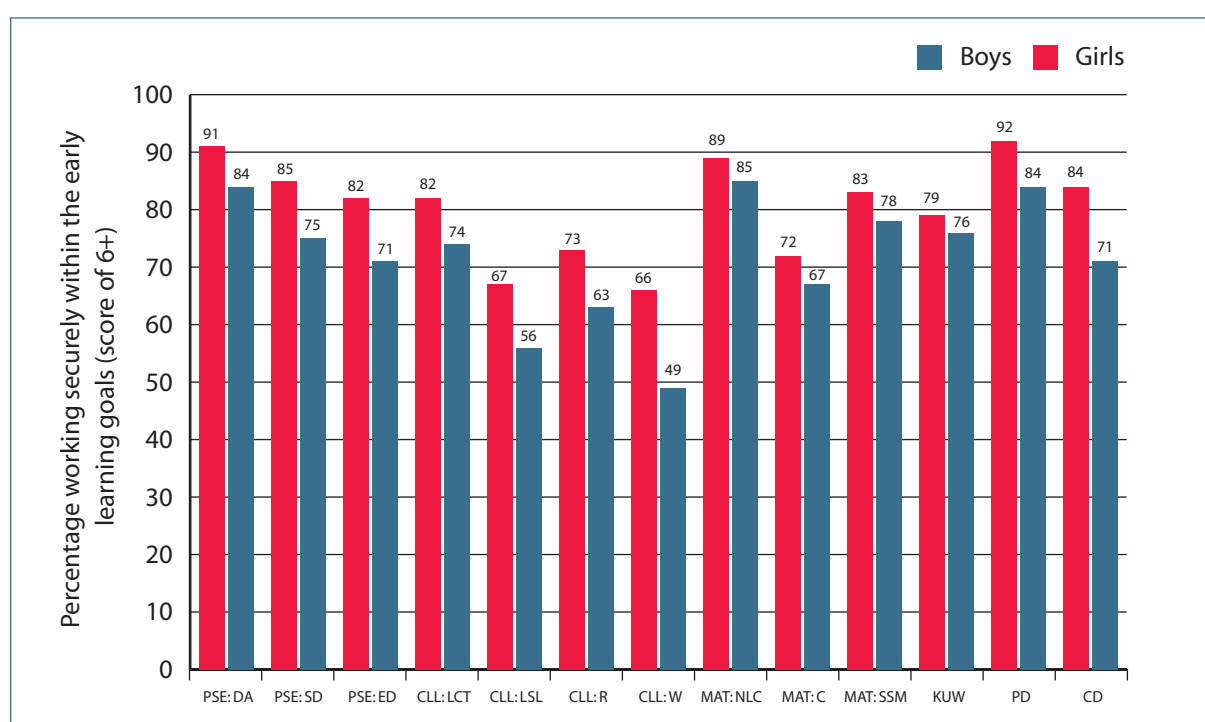
- Personal, social and emotional development (3 assessment scales)
- Communication, language and literacy (4 assessment scales)
- Mathematical development (3 assessment scales)
- Knowledge and understanding of the world (1 assessment scale)
- Physical development (1 assessment scale)
- Creative development (1 assessment scale).

¹⁴ Children are observed by their teachers and scored through teacher assessment.

Girls perform consistently better than boys across all 13 scales (see Figure 5-1). Based on the measure that a score of 6 or more on an assessment scale indicates that a child is working securely within the early learning goals, the largest differences between boys and girls is on literacy measures (17 percentage points for Writing; 11 percentage points for Linking Sounds and Letters and 10 percentage points for Reading). Large differences were also noted on Creative Development (13 percentage point difference) and Emotional Development (11 percentage point difference). The smallest differences were on the three mathematical scales and on Knowledge and Understanding of the World.

The pattern of a large gender gap in English/literacy and a smaller gender gap in Maths that is seen at the end of compulsory schooling is thus replicated in assessments at the start of compulsory schooling.

Figure 5-1 Attainment on the 13 Assessment Scales of the Foundation Stage Profile by Gender (2006)



Key:

PSE: DA Personal, social and emotional development: Dispositions and attitudes

PSE: SD Personal, social and emotional development: Social development

PSE: ED Personal, social and emotional development: Emotional development

CLL: LCT Communication, language and literacy: Language for communication and thinking

CLL: LSL Communication, language and literacy: Linking sounds and letters

CLL: R Communication, language and literacy: Reading

CLL: W Communication, language and literacy: Writing

MAT: NLC Mathematical development: Numbers as labels for counting

MAT: C Mathematical development: Calculating

MAT: SSM Mathematical development: Shape, space and measures

KUW Knowledge and understanding of the world

PD Physical development

CD Creative development

Source: SFR 03/2007 Foundation Stage Profile 2006 – National Results (Final) issued January 2007

5.4 Gender Gap across Key Stages and A-Level

This section focuses on the core subjects of English, Maths and Science, examining patterns across the Key Stages¹⁵ and beyond.

5.4.1 English

Historically, girls have done significantly better than boys in English and this pattern is evident at all stages of compulsory education (see Figure 5-3):

- At the Foundation Stage, the greatest differences between boys and girls in those working securely within the early learning goals is on literacy measures (17 percentage points for Writing; 11 percentage points for Linking Sounds and Letters and 10 percentage points for Reading)
- The gap continues to increase with each Key Stage (the figures for those at the expected level are Key Stage 1 Reading: 9 percentage points; Key Stage 2 English: 11 percentage points; Key Stage 3 English: 15 percentage points; GCSE English: 14 percentage points).

Comparing across Key Stages between 1997 and 2006, there does seem to be an overall trend for a very slight narrowing of the gender gap in English (see Figure 5-2), with the exception of Key Stage 1 Writing where the gap is widening slightly.

¹⁵ SFR 22/2006 National Curriculum Assessments at Key Stage 2, and Key Stage 1 to Key Stage 2 Value Added Measures for England 2004/2005 (Final), issued June 2006.
SFR07/2007 National Curriculum Assessments at Key Stage 3 in England, 2006 (Provisional), issued February 2007.
SFR 30/2006 National Curriculum Assessments at Key Stage 1 in England, 2006 (Provisional), issued August 2006.
SFR01/2007 GCSE and equivalent results in England 2005/06 (Provisional), issued January 2007.
SFR 22/2006 National Curriculum Assessments at Key Stage 2, and Key Stage 1 to Key Stage 2 Value Added Measures for England 2004/2005 (Final), issued September 2006.

Figure 5-2 Percentage of Pupils Achieving Expected Level by Gender and Percentage Point Difference Between Girls and Boys, Key Stages 1–4: English, Maths and Science (1997–2006)

	KS1 Reading			KS1 Writing			KS2 English			KS3 English			KS4 English		
	Boys	Girls	Gender Gap	Boys	Girls	Gender Gap	Boys	Girls	Gender Gap	Boys	Girls	Gender Gap	Boys	Girls	Gender Gap
1997	75	85	10	75	85	10	57	70	13	48	67	19	46	63	17
1998	75	85	10	76	86	10	57	73	16	56	73	17	48	64	16
1999	78	86	8	78	88	10	65	76	11	55	73	18	50	66	16
2000	79	88	9	80	89	9	70	79	9	55	73	18	51	66	15
2001	80	88	8	82	90	8	70	80	10	57	73	16	51	66	15
2002	81	88	7	82	90	8	70	79	9	59	76	17	52	67	15
2003	80	88	8	76	87	11	70	81	11	62	76	14	52	68	16
2004	80	89	9	76	87	11	72	83	11	64	77	13	53	67	14
2005	81	89	8	77	88	11	74	84	10	67	81	14	54	69	15
2006	80	89	9	76	87	11	74	85	11	65	80	15	55	69	14

	KS1 Maths			KS2 Maths			KS3 Maths			KS4 Maths		
	Boys	Girls	Gender Gap	Boys	Girls	Gender Gap	Boys	Girls	Gender Gap	Boys	Girls	Gender Gap
1997	82	85	3	63	61	-2	60	60	0	47	47	0
1998	83	86	3	59	58	-1	60	59	-1	47	48	0
1999	85	88	3	69	69	0	62	62	0	49	49	1
2000	89	91	2	72	71	-1	64	65	1	50	50	0
2001	90	92	2	71	70	-1	65	67	2	51	51	1
2002	89	92	3	73	73	0	67	68	1	52	53	0
2003	89	91	2	73	72	-1	70	72	2	51	52	1
2004	89	92	3	74	74	0	72	74	2	53	53	1
2005	90	92	2	75	75	0	73	74	1	54	56	2
2006	89	92	3	76	75	-1	76	77	1	55	57	2

Note: Figures for 2006 are revised, except for Key Stage 1 data which are provisional

Source: DfES Statistical First Releases

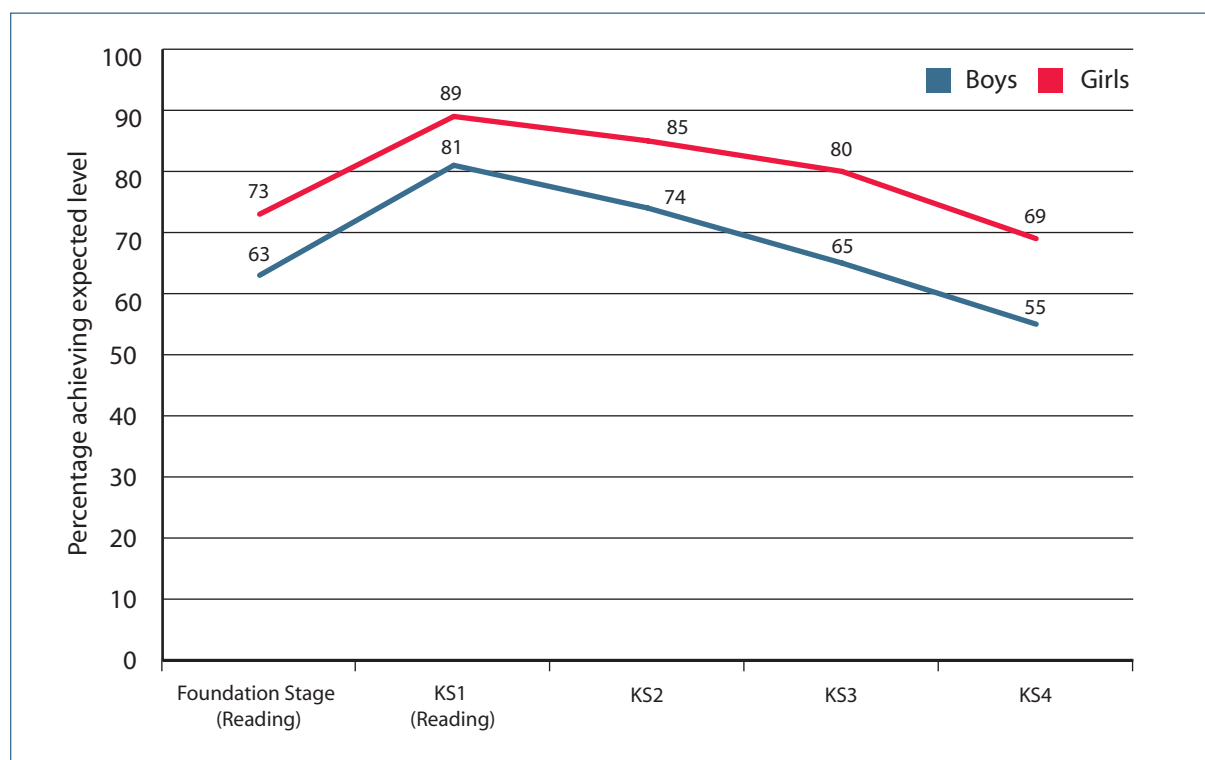
Continuation of Figure 5-2

	KS2 Science			KS3 Science			KS4 Double Award Science		
	Boys	Girls	Gender Gap	Boys	Girls	Gender Gap	Boys	Girls	Gender Gap
1997	68	69	1	61	60	-1	48	49	1
1998	70	69	-1	57	55	-2	49	51	2
1999	79	78	-1	55	55	0	48	51	3
2000	84	85	1	61	58	-3	49	52	3
2001	87	88	1	66	66	0	50	53	3
2002	86	87	1	67	67	0	50	54	3
2003	86	87	1	68	69	1	52	54	3
2004	86	86	0	65	67	2	53	55	2
2005	86	87	1	69	70	1	56	58	2
2006	86	87	1	71	73	2	56	58	2

Note: Figures for 2006 are revised, except for Key Stage 1 data which are provisional

Source: *DfES Statistical First Releases*

Figure 5-3 Foundation Stage / Key Stages English/Reading Gender Gap (2006 Revised Figures)



*Note: Key Stage 1 data are provisional
Source: DFES Statistical First Releases*

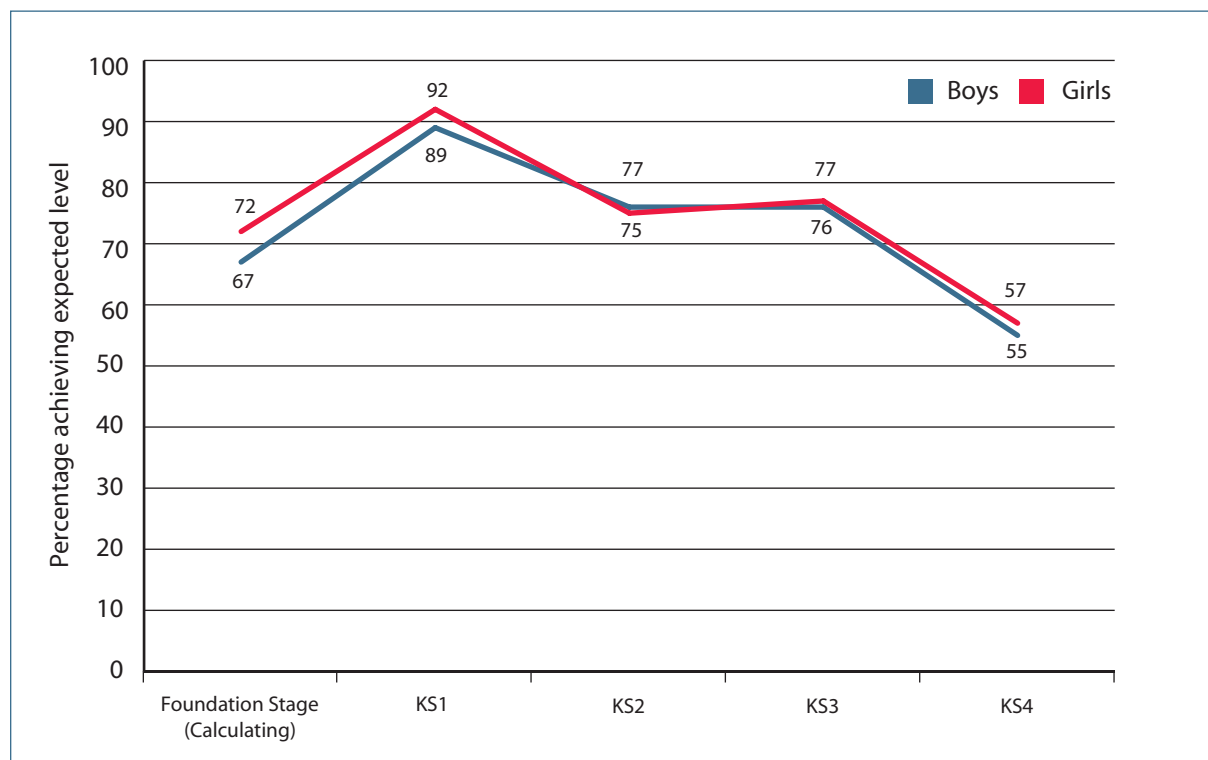
5.4.2 Maths

As we have seen in previous sections, Maths has been a subject where traditionally boys did slightly better than girls. However, this pattern has changed since 1997 with girls performing slightly better than boys at GCSE Maths.

The pattern across age groups also favours girls (see Figure 5-4):

- At the Foundation Stage, girls score 4-5 percentage points higher than boys in the Maths tasks (Numbers as labels for counting; calculating; shape, space and measures)
- At Key Stages 1-4, boys and girls score within 1-2 percentage points of each other, at Key Stages 1, 3 and 4, this is in the girls' favour.

Comparing across Key Stages between 1997 and 2005, in contrast to English, the gender gap is small and relatively stable (see Figure 5-4).

Figure 5-4 Foundation Stage / Key Stages Maths Gender Gap (2006 Revised Figures)

Note: Key Stage 1 data are provisional
Source: DFES Statistical First Releases

5.4.3 Science

There are negligible differences between the sexes in Science at Key Stages 2 and 3 and this pattern has remained stable over a number of years. At GCSE Double Award Science, Chemistry and Biology¹⁶, the gap is also negligible. There is a 5 percentage point difference in girls' favour for Single Award Science. However, it is worth noting that Physics and Biological Sciences are the only GCSEs where boys perform better than girls (by one percentage point).

5.5 Attainment at the Extremes

5.5.1 High Achievers

In English, girls are more likely than boys to attain at the highest levels/grades compared to boys but this diminishes across the Key Stages. By A-Level, there is no gender difference at A grade.

The pattern in Maths is rather different. Here, boys are more likely to succeed at the higher levels between Key Stages 1-3 but this diminishes to a very small advantage at GCSE A*. At A-Level, the pattern has reversed so that 43 percent of girls achieve an A grade compared to 39 percent of boys.

¹⁶ The individual sciences and Single Award Science are taken by a small proportion of students compared to Double Award Science.

Figure 5-5 Gender Difference: High Achievers (Girls-Boys) (2006)

	Key Stage 1 (level 3 or above)	Key Stage 2 (level 5 or above)	Key Stage 3 (level 7 or above)	Key Stage 4 (A* grade)	A-Level (A grade)
English	9 (Reading)	13	6	2	0
Maths	-5	-4	-2	0	4
Science	-2	-1	1	1	N/A
				(Double Award)	

Note: A minus number indicates a male advantage

Source: DFES Statistical First Releases (Key Stage 1 provisional figures and Key Stage 3 revised figures)

5.5.2 Low Achievers

Boys are more likely than girls to gain lower levels/grades in English though the gap narrows across the Key Stages. This is also the case in Maths, but the gap is very narrow.

Figure 5-6 Gender Difference: Low Achievers (Girls-Boys) (2006)

	Key Stage 1 (below level 3 or above)	Key Stage 2 (below level 5 or above)	Key Stage 3 (below level 7 or above)	Key Stage 4 (G grade)	A-Level (E grade)
English	-8 (Reading)	-4	-8	-2	-1
Maths	-3	0	0	-1	-2
Science	-3	-1	1	0	N/A
				(Double Award)	

Note: A minus number indicates that boys are more likely than girls to achieve the lower grade

Source: DFES Statistical First Releases (Key Stage 1 provisional figures and Key Stage 3 revised figures)

5.6 Pupil Progression

So far, we have examined absolute gaps between boys and girls. It is also important to examine the amount of progress that boys and girls make at school between one Key Stage and the next. This can be done through looking at Contextual Value Added (CVA) analysis which seeks to pinpoint what impact the school has on a child's attainment (as opposed to other, external factors that might impact on attainment).

Rather than absolute levels of attainment, CVA describes the progress a school helps pupils to make compared to their different starting points i.e. it takes account of prior attainment. In addition, it also adjusts to account for the impact of certain external or pupil level factors which are known to have had an impact on the progress of individual pupils (e.g. ethnicity; FSM; pupil mobility). The model gives co-efficients for each factor.

The following table gives the co-efficients for girls i.e. it shows how much greater/less progress they make than boys at primary school (progress between Key Stage 1 and Key Stage 2) and at secondary school (progress between Key Stage 2 and Key Stage 4). A positive co-efficient shows that girls make greater progress than boys; a negative co-efficient shows boys are making better progress than girls.

This shows that, taking account of other factors (e.g. FSM, ethnicity and prior attainment):

- Girls make better progress than boys in English (the equivalent of about half a term's progress) but worse progress than boys in Maths at primary school (equivalent to boys making an extra term's progress).

- At secondary school, girls make better progress than boys in English (equivalent to less than one grade better in GCSE English) and slightly better progress than boys in Maths.

Figure 5-7 Contextual Value Added Scores for Girls (2006 Co-Efficients)

	English	Maths
KS1-KS2	0.61	-0.97
KS2-KS4	2.22	0.29

Note: The CVA model calculates progress in a particular subject between Key Stages. For KS1-2, a co-efficient of 1 is equal to about a term's progress. For KS2-4, a co-efficient of 6 is equal to about one grade
Source: Unpublished DfES CVA model

In summary, taking account of prior attainment and other factors, there is only a relatively small difference between boys' and girls' progress. Rather than dramatically different rates of progress between boys and girls, the trend seems to be for a pervasive gender gap in English (but not in Maths and Science) throughout the compulsory education system.

6 Gender, Social class and Ethnicity: Relative Impact and Interactions

6.1 Introduction

The first part of this chapter puts the focus on the underachievement of boys in context. Pupils are underachieving for other reasons apart from gender. Social class and ethnicity (or, more precisely, being a member of some ethnic groups) are two other factors that have a significant and greater impact on attainment than gender. The second part of the chapter explores how gender interacts with these other factors, identifies underachieving subgroups defined by these factors and examines the role gender plays within these underachieving subgroups.

6.2 Key Findings

- The social class attainment gap at Key Stage 4 (as measured by percentage point difference of those eligible/not eligible for free school meals) is three times as wide as the gender gap.
- Some minority ethnic groups attain significantly below the national average and their under-achievement is much greater than the gap between boys and girls.
- Nonetheless, gender is an independent and significant predictor of attainment.
- The gap in attainment at GCSE between boys and girls is relatively stable across social class i.e. the effect of gender does not systematically vary to any great extent across social class.
- There does appear to be systematic variation between some ethnic groups and gender at GCSE, principally Black Caribbean and Black Other pupils have wider gender gaps than other ethnic groups. Black Caribbean and Black Other boys are the least likely of any ethnic group to achieve 5+ A*-C GCSE passes (but Black Caribbean and Black Other girls are not disadvantaged to the same extent).
- Eligibility for FSM is more closely associated with lower attainment for White British boys and girls than for children from minority ethnic groups at GCSE. Being eligible for FSM depresses White British boys' chances of gaining 5+ A*-C GCSEs by 32 percentage points and White British girls' by 34 percentage points i.e. the effect of FSM is large for White British children but the effect is broadly similar on White British boys' and girls' achievement (a little greater for girls).

- Consideration of social class and ethnicity alongside gender helps to identify which children are “underachieving”. The analyses show that labelling boys as “underachieving” is too broad-brush, but highlighting White British FSM boys as “underachieving” (because they are a large group with the lowest attainment at GCSE, apart from traveller groups) risks losing sight of other children with low attainment. White British FSM boys, Black Caribbean FSM boys and White British FSM girls are all doing significantly less well than the national average (respectively, 33, 30 and 26 percentage points less well than average attainment at GCSE). In addition, the attainment of Black Caribbean non-FSM boys is well below the average (18 percentage points lower). The reasons for these groups’ lower attainment are poorly understood but this chapter shows that for each group, a different combination of factors (with gender playing a role) may be of relevance.

6.3 Relative Effects of Social Class, Ethnicity and Gender

The social class attainment gap is much wider than the gender gap (for findings on gender, social class and school behaviour, see Chapter 13). Using the measure of pupils eligible for free school meals (FSM), there is a 28 percentage point gap between FSM and non-FSM for pupils (with non-FSM pupils ahead of FSM pupils) gaining 5 or more A*-C GCSEs (compared to the equivalent gender gap of 10 percentage points)¹⁷.

FSM is a blunt measure of socio-economic class: it compares 13 percent of the pupils who are eligible for FSM with the 87 percent who are not eligible. As the non-FSM group contains a wide range of pupils from different social classes, it is useful to examine data which differentiates pupils’ social class more precisely.

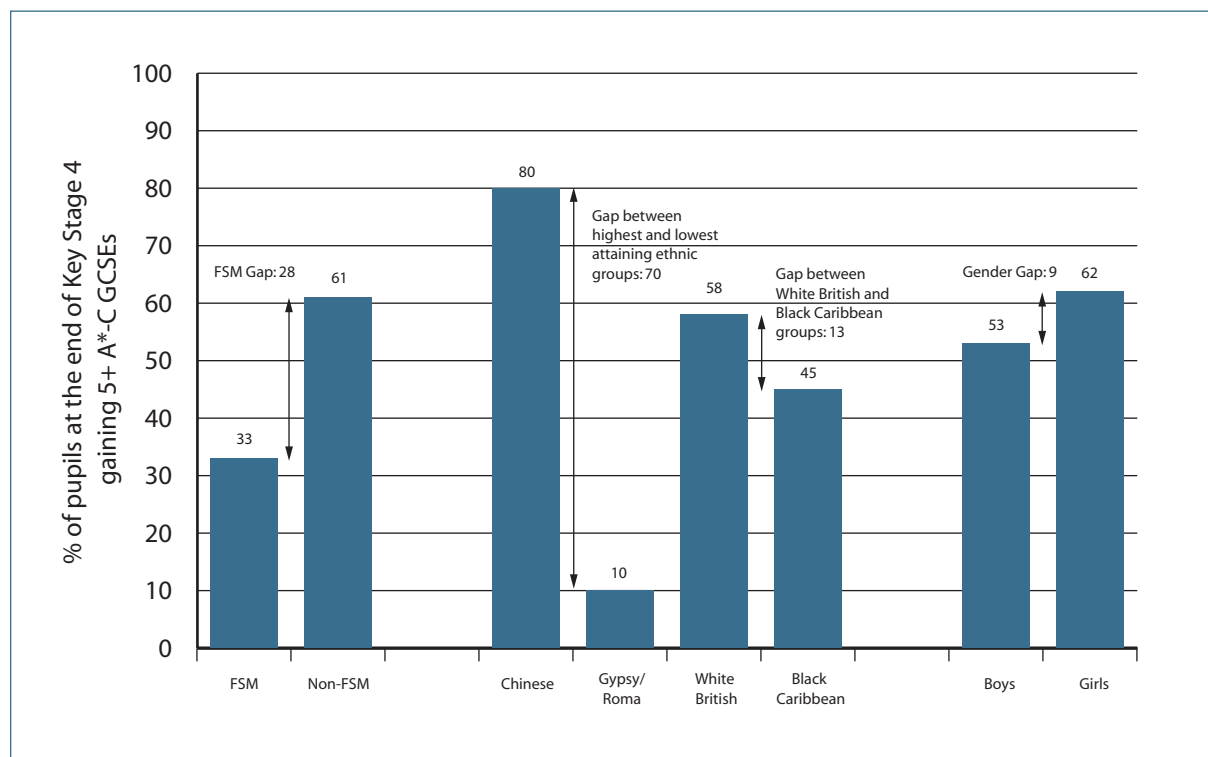
Indeed, using other measures of social class (adapted from the standard Office for National Statistics socio-economic classification), the gap can look even more dramatic. Data from the Youth Cohort Study (2004)¹⁸ show a 44 percentage point difference of children from higher professional backgrounds and children from routine backgrounds in attaining five A*-C GCSEs and attainment differentials between all of the social class groupings (see Figure 6-4 for further breakdowns by social class)¹⁹.

For some ethnic groups, the gap is also wider than the gender gap. Black Caribbean pupils attain 12 percentage points lower at 5+ A*-C GCSE than the overall national average (45 percent compared to 57 percent) and Gypsy/Roma pupils (a small group with lots of missing data but the worst performing ethnic group) perform 47 percentage points below the average.

¹⁷ Figures in this section are from 2006: SFR04/2007 National Curriculum Assessment, GCSE and Equivalent Attainment and Post-16 Attainment by Pupil Characteristics in England 2005/06, issued February 2007.

¹⁸ The Youth Cohort Study of England and Wales is a large scale DfES funded longitudinal survey on the educational achievements of school leavers.

¹⁹ It is worth noting that the total proportion of FSM pupils (13 percent) is the same for the YCS “Routine” occupation classification (13 percent) i.e. the non-FSM pupils (87 percent) would presumably fall into the other YCS categories (Higher professional, Lower professional, Intermediate, Lower supervisory and Other). These latter categories are also differentiated by attainment compared to the blunt non-FSM measure.

Figure 6-1 Effects of FSM, Ethnicity and Gender: 5+ A*-C GCSE (2006)

Note: The Gypsy/Roma group is very small, probably because of missing data for this group, and therefore this may not be an accurate reflection of their attainment

Connolly (2006)²⁰, using three years' of data from the Youth Cohort Study (1997-2001) shows (through the use of logistic regression) that social class and ethnicity exert independent effects on GCSE attainment and these tend to overshadow the relatively minor effect exerted by gender.

Charts 6-2 and 6-3 also illustrate the greater effect of FSM using data from the National Pupil Database. They show the effect particular characteristics have on a pupil's odds²¹ of being a low attainer. Where a characteristic has a factor of more than one, a pupil is more likely to become a low attainer, all other things being equal. For example, FSM has a factor of 1.65, which means that the odds of being a low attainer are 65% higher for FSM pupils than for non-FSM pupils with similar prior attainment and characteristics. Where a characteristic is shown as having a factor of less than one, then having this characteristic is associated with a pupil being less likely to become a low attainer, other things being equal.

At Key Stage 2, the odds of being a low attainer are increased if you are a girl, but not to the same extent as being eligible for FSM. This seems surprising given the lower attainment of boys in English at Key Stage 2 (11 percentage point difference). However, the gap in Science is narrow at Key Stage 2 (1 percentage point) and in Maths, boys are 2 percentage points ahead of girls so the composite score used in these calculations may explain the finding in favour of boys.

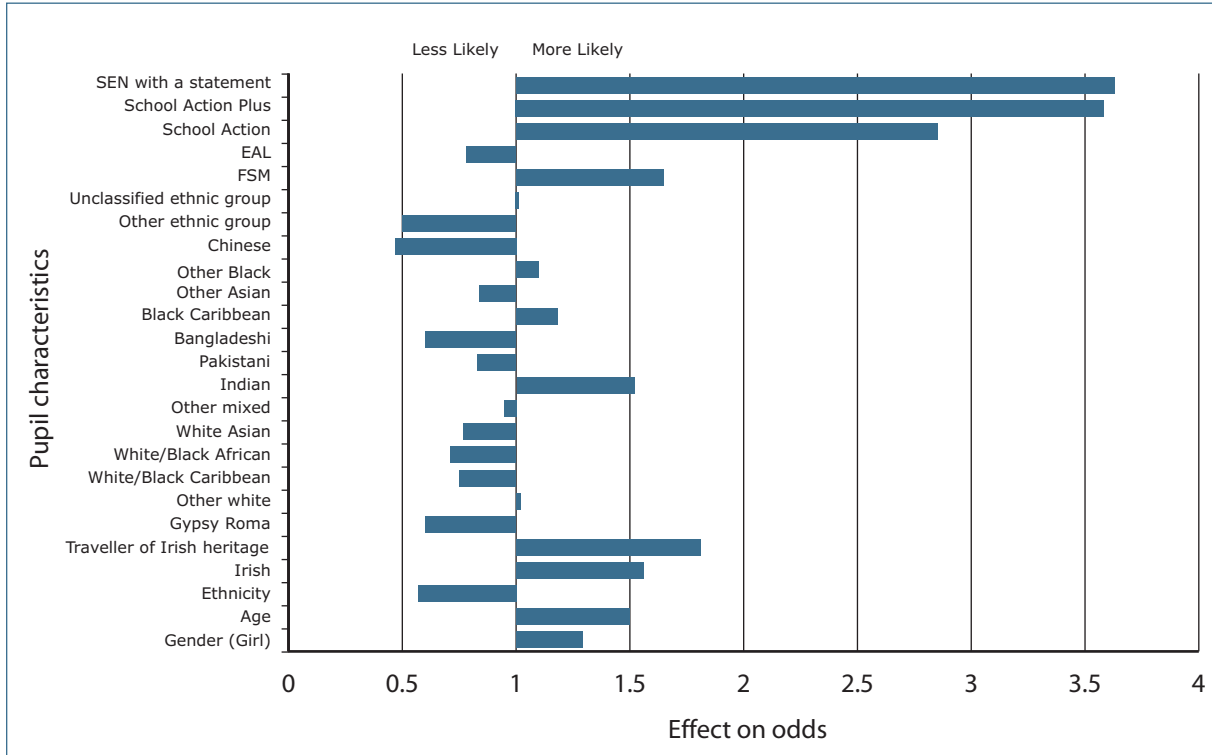
The pattern is reversed at Key Stage 4, where being a boy increases the odds of low attainment, but again not to the same extent as FSM. These findings show that the likelihood of boys being low attainers is greater at Key Stage 4 than Key Stage 2 and probably reflects

²⁰ Connolly, P. (2006). The effects of social class and ethnicity on gender differences in GCSE attainment: a secondary analysis of the Youth Cohort Study of England and Wales 1997-2001, *British Educational Research Journal*, 32(1), 3-21.

²¹ An odds ratio is the ratio of the odds of one group having a particular outcome compared to another group.

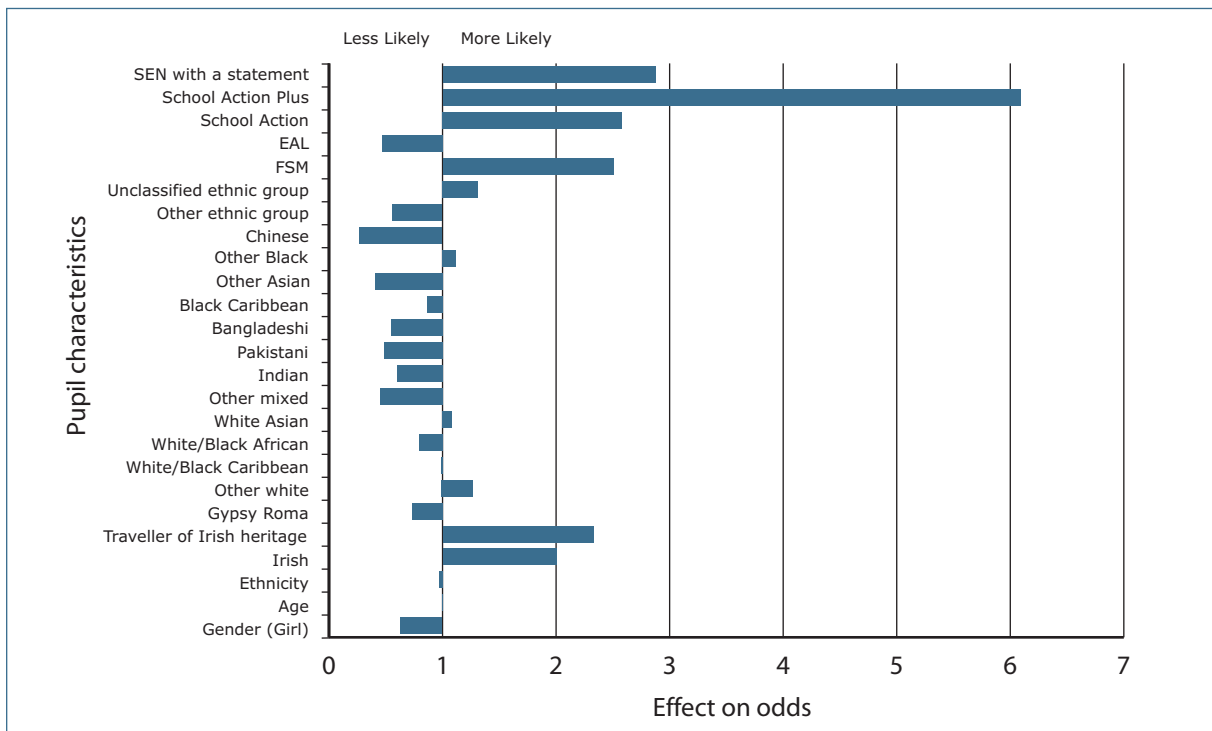
the fact that the gender gap is measured over a wider range of subjects at Key Stage 4 than at Key Stage 2.

Figure 6-2 The Effect of Various Pupil Characteristics on the Odds of Being a Low Attainer at Key Stage 2 (2004)



Source: B02/2005 Statistics of Education: The Characteristics of Low Attaining Pupils, issued June 2005

Figure 6-3 The Effect of Various Pupil Characteristics on the Odds of Being a Low Attainer at Key Stage 4 (2004)



Source: B02/2005 Statistics of Education: The Characteristics of Low Attaining Pupils, issued June 2005

6.4 Ethnicity, Gender and Social Class Interactions

The Connolly Hypotheses

The data reviewed so far show independent and significant effects of social class, ethnicity and gender. However, it is also important to explore the interactions or inter-relationships between these variables. Connolly (2006) describes and interrogates two competing models of the way these variables could be related to each other.

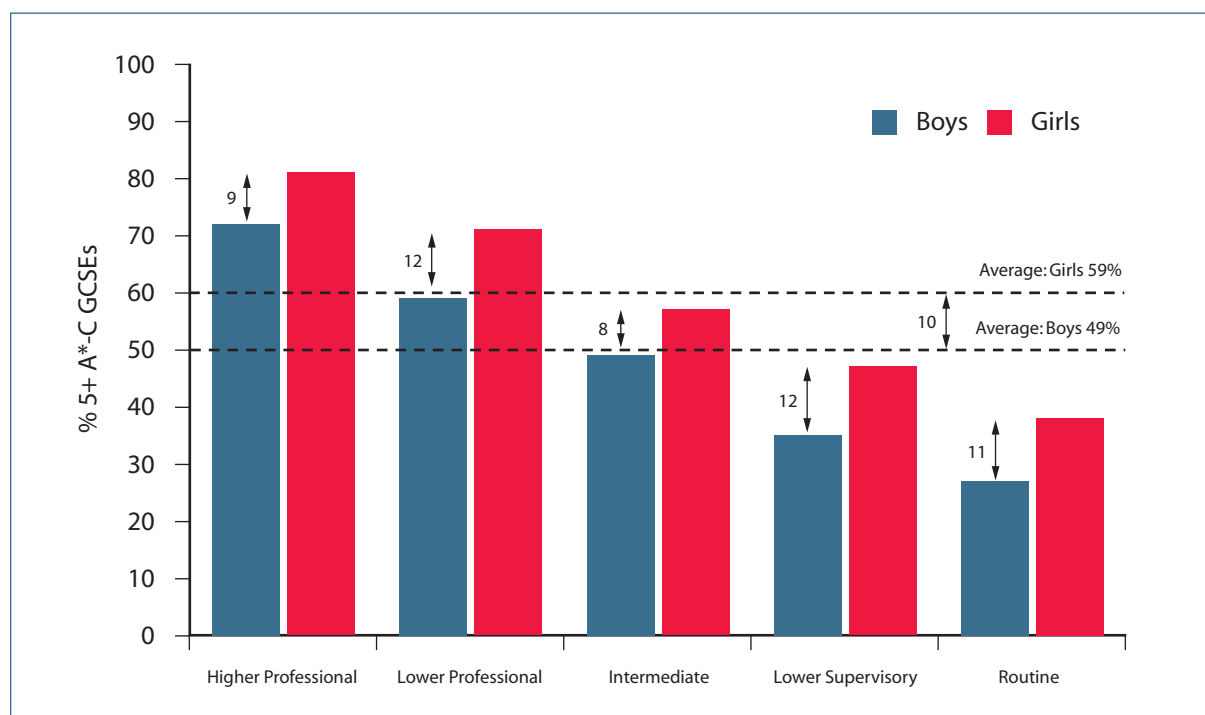
A **“main effects model”** predicts that gender tends to exert an effect on boys’ and girls’ levels of achievement independent of either social class or ethnicity i.e. the differences between boys and girls are relatively stable across social class and ethnicity.

The competing **“interactions effects model”** predicts that the differences between boys and girls is not actually stable but systematically varies across social class and/or ethnic group i.e. it is the particular combination of gender and class or gender and ethnicity that is behind the attainment gaps.

This is an important issue and the literature around masculine identities and class is reviewed in Chapter 14 “Why is there a Gender Gap?”. As Connolly discusses (2006), a range of findings from qualitative research would support an “interactions effects model”. For example, boys from the most marginalised backgrounds are more likely to develop anti-school subcultures by developing specific forms of masculinity (manifested, in particular, by disruptive behaviour in class). This might contrast to middle-class boys whose masculinity could manifest as competitiveness and displaying of academic ability, without being seen to work hard i.e. these types of masculinity would have less of an impact on attainment than the kinds manifested by the working class or marginalised groups. This research tends to focus specifically on boys and on masculinity: the implication is that social class affects boys and girls differently.

Connolly examined three years of data from the Youth Cohort Study (YCS) which tracks large samples of school leavers, recording, amongst many variables, GCSE attainment and individual characteristics. He found evidence for the “main effects model” but not for the “interactions model”. As already discussed in 6.3, using a logistic regression, he found independent effects of ethnicity, social class and gender, with ethnicity and social class having a greater impact on attainment than gender. Looking for consistent patterns across the years of data, Connolly found no evidence of any interactions between gender and social class or gender and ethnicity either by examination of raw data or by using a log-linear analysis. He therefore concluded that the relatively small effect of gender is stable and constant across all social class and ethnic groups i.e. the underachievement of boys relative to girls is not just an issue for working-class boys or boys from particular minority ethnic groups.

The chart below presents Youth Cohort Study data from 2004 (a more recent dataset to the data analysed by Connolly) and shows no systematic variation in the gender gap across occupational groups i.e. there is no clear relationship between social class and the extent of the gender gap at GCSE.

Figure 6-4 Percentage of Pupils Gaining 5+ A*-C GCSEs by Gender and Occupational Class (2004)

Source: Youth Cohort Study, unpublished DfES data, 2004

These findings can be tested against the National Pupil Database (NPD) which contains information on Key Stage results and on all pupils in England, avoiding some of the problems encountered by surveys such as the YCS (response rate; non-response bias). This is especially important with the ethnicity variable as the YCS samples contain some small sample sizes for some of the minority ethnic group categories. However, it should be noted the FSM variable is a blunter measure of socio-economic group than the parent occupation variable used in the YCS. The findings are reported in the next section.

6.4.1 The Relationship between FSM and Gender

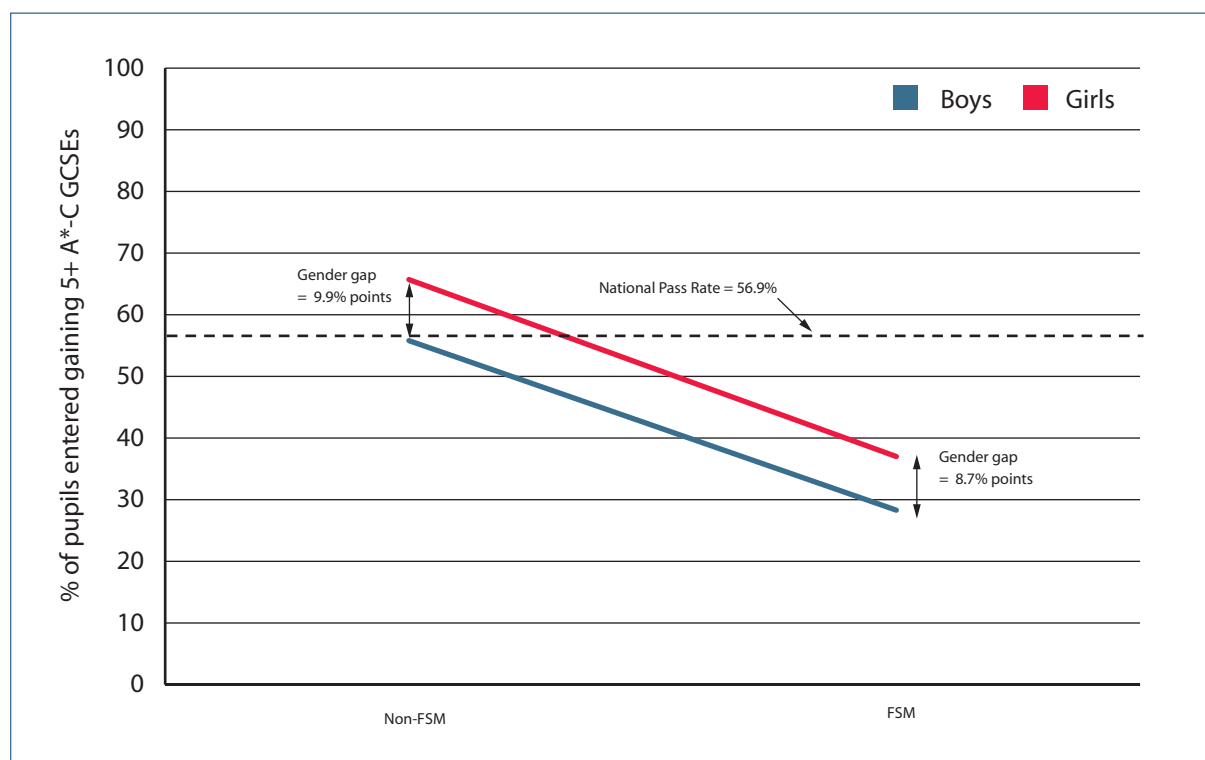
For 5+ A*-C GCSE, FSM pupils are at a significant disadvantage: only 28 percent of FSM boys will achieve 5+ A*-C GCSEs compared to 55.8 percent of non-FSM boys; and only 37 percent of FSM girls compared to 65.7 percent of non-FSM girls.

The effect of being eligible for FSM has a slightly greater impact on girls than boys: for girls, FSM eligibility depresses attainment by 28.7 percentage points (65.7% points minus 37% points) and by 27.5 percentage points for boys (55.8% points minus 28.3% points). Another way of describing this is that there is a small difference in the gender gap between FSM and non-FSM pupils, with a slightly larger gender gap for non-FSM pupils (as illustrated in Figure 6-5). This pattern is also borne out by a regression analysis²² and by examining odds

²² A regression analysis of the National Pupil Database confirms that the interaction between FSM and gender at GCSE is much smaller than the effects for FSM and gender separately. The regression analysis controlled for other pupil level characteristics that could influence the relationship on attainment. This analysis was carried out on NPD data from 2006 by DfES statisticians. An ordinary least squares regression model was conducted using capped GCSE score as the dependent variable and the following factors as independent variables: gender, ethnicity, FSM, pupil mobility, EAL, SEN, age, looked after status. The baseline for the model was non-FSM boys. The two main effects of FSM and gender were statistically significant: the co-efficient for FSM was -53.7 and 15.6 for gender (in favour of girls). The FSM x gender interaction was also statistically significant with a co-efficient of -2.1 i.e. the effect of gender on attainment does vary across FSM category (and vice versa), resulting in the negative effect of FSM being slightly greater for girls than boys. However, the interaction term has little explanatory power in the model compared to the large main effects of FSM and gender.

ratios. The odds ratio for achieving 5+ A*-C GCSEs for non-FSM pupils is 1.52 in favour of girls and the odds ratio for FSM pupils is 1.49 in favour of girls, slightly smaller.

Figure 6-5 The Gender Gap for FSM and Non-FSM pupils (5+ A*-C GCSEs, 2006)



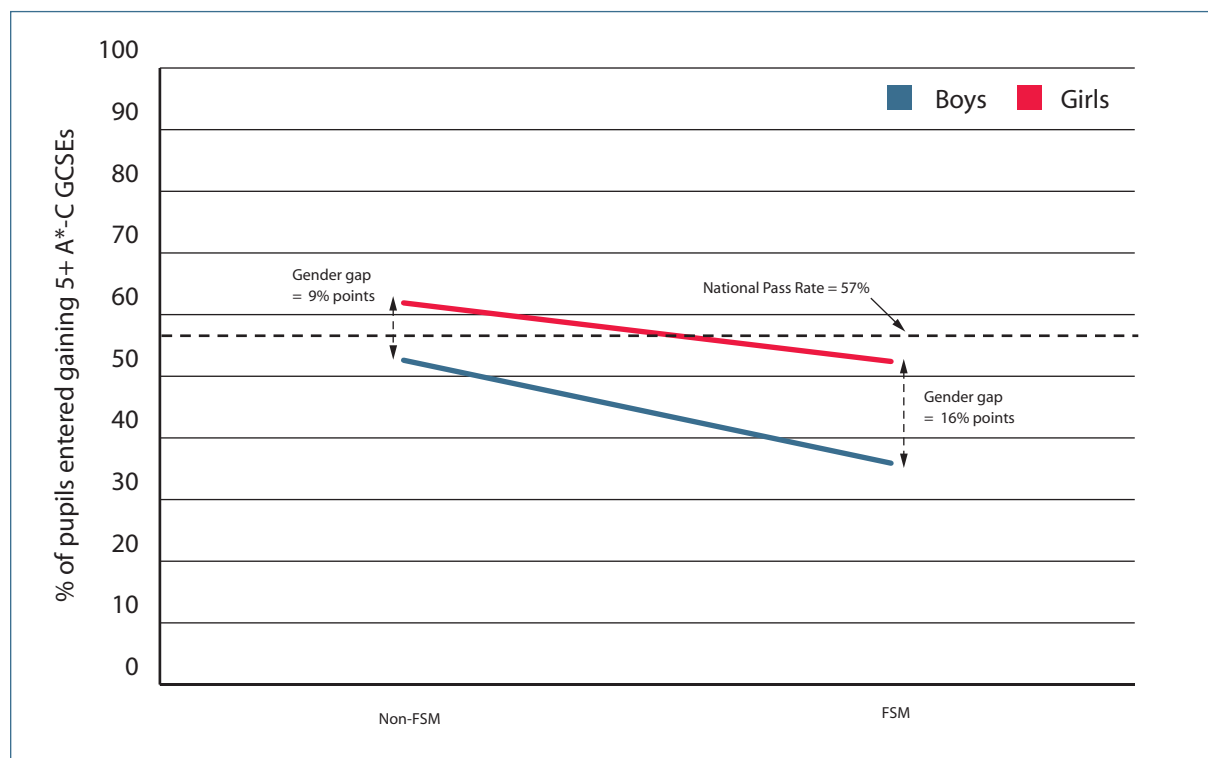
Source: SFR46/2006 National Curriculum Assessment, GCSE and Equivalent Attainment and Post-16 Attainment by Pupil Characteristics in England 2005/06 (Provisional), issued November 2006

6.4.2 The Relationship between Ethnicity and Gender

An examination of the raw data for the ethnicity by gender interaction does not confirm Connolly's findings but instead supports his "interactions model".

There appear to be systematic differences at GCSE between some ethnic groups by gender, principally Black Caribbean pupils and Black Other pupils, where the gender gap is larger than average i.e. Black Caribbean and Black Other boys in particular are a low achieving group, over and above that predicted by the independent effect of gender.

Figure 6-6 shows the large gender gap for Black Caribbean pupils at GCSE, with scores depressed for Black Caribbean boys, making them one of the lowest attaining ethnic groups.

Figure 6-6 The Larger Gender Gap for Black Caribbean pupils (5+ A*-C GCSEs, 2006)

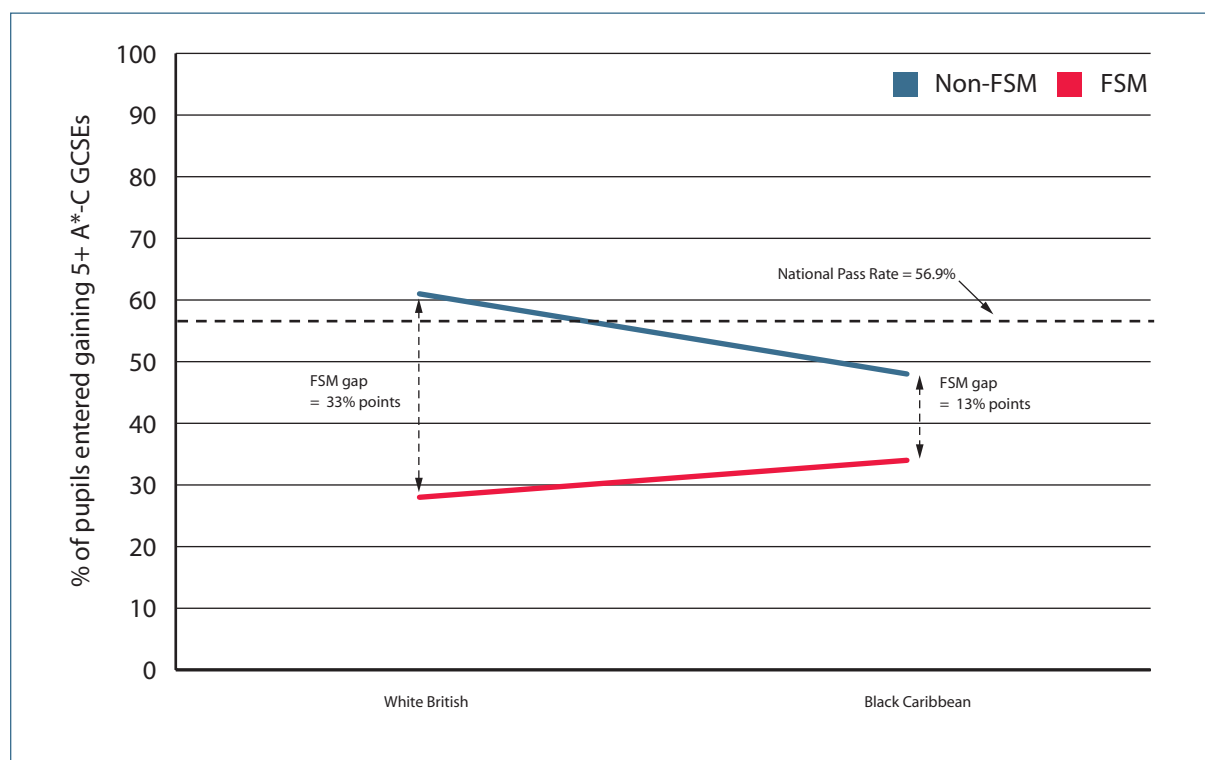
Source: SFR46/2006 National Curriculum Assessment, GCSE and Equivalent Attainment and Post-16 Attainment by Pupil Characteristics in England 2005/06 (Provisional), issued November 2006

6.4.3 The Relationship between FSM and Ethnicity

It is also worth looking at the interaction between FSM and ethnicity, regardless of gender. As already noted there is a large gap between FSM and non-FSM pupils at GCSE (28 percentage points in 2006), a much larger gap than the gender gap. However, this appears to systematically vary depending on the ethnic group. Indeed, the majority of the minority ethnic groups have a much smaller FSM/non-FSM gap than is the case for pupils overall (and, in effect, White British pupils who make up the majority of pupils) across Key Stages²³. The regression analysis again found that this smaller FSM gap was statistically significant for many of the minority ethnic groups at GCSE compared to White British pupils. This is illustrated in Figure 6-7 by the large FSM gap for White British pupils compared to Black Caribbean pupils. While Black Caribbean and Black Other pupils have a larger than average gender gap, they have a smaller than average “deprivation gap”.

²³ See the following statistical first release for data: SFR46/2006 National Curriculum Assessment, GCSE and Equivalent Attainment and Post-16 Attainment by Pupil Characteristics in England 2005/06 (Provisional), issued November 2006.

Figure 6-7 The Larger FSM gap for White British Pupils Compared to Black Caribbean Pupils (5+ A*-C GCSEs, 2006)



Source: SFR46/2006 National Curriculum Assessment, GCSE and Equivalent Attainment and Post-16 Attainment by Pupil Characteristics in England 2005/06 (Provisional), issued November 2006

6.4.4 The Relationship Between Gender, FSM and Ethnicity: the Case of White British FSM Boys

White British FSM boys are one of the worst performing ethnic groups at GCSE (see Figure 6-8). They are also amongst the lowest attaining groups at other Key Stages. Here we explore the reasons for their particularly poor attainment at GCSE: is this the result of the independent effects of being eligible for FSM and being a boy (as previously explored, these depress attainment) plus the added disadvantage that FSM seems to have in particular for White British pupils? Or is there a unique additional contribution from having a combination of all these factors?

At GCSE (using the 5+ A*-C measure), being eligible for FSM depresses scores by 32 percentage points for White British boys and 34 percentage points for girls i.e. the effect of FSM is huge for White British children, but the effect on boys' and girls' attainment is broadly similar (lowering White FSM girls' attainment slightly more than White FSM boys).

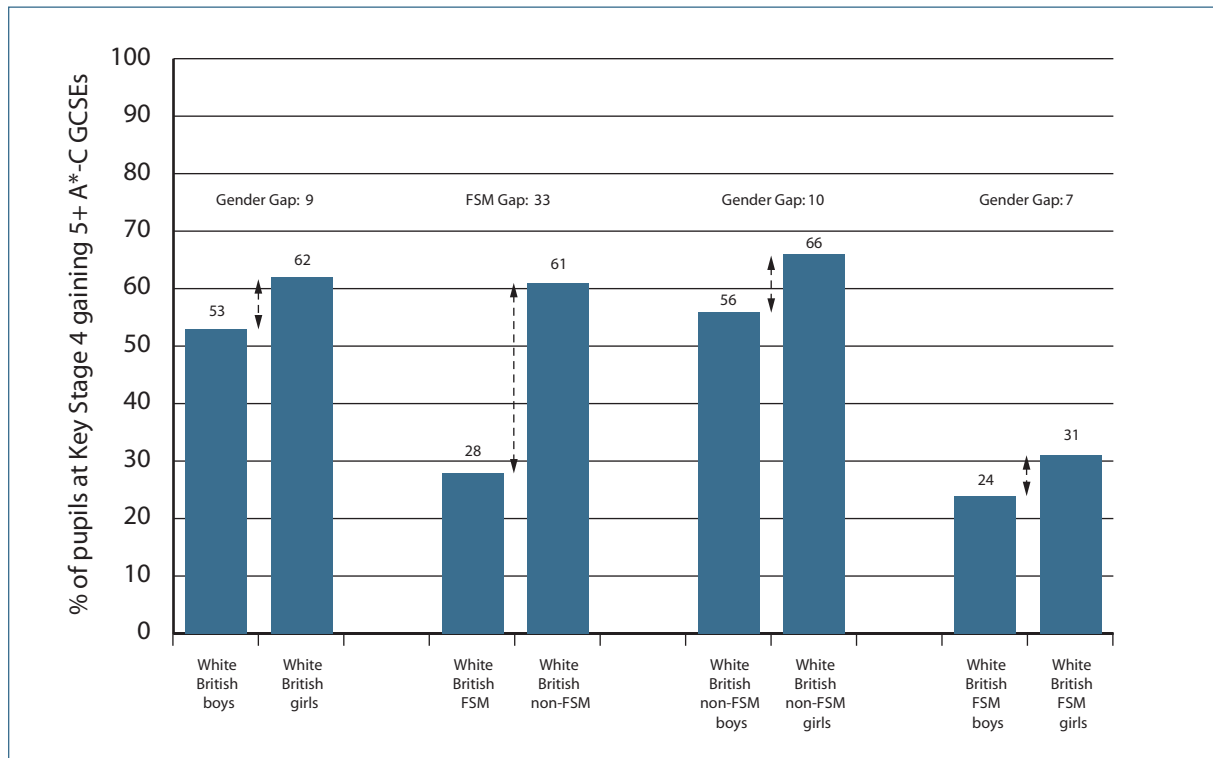
This is an important finding as it implies that, while being a White British FSM pupil places one at a particular disadvantage, the disadvantage is broadly similar for both boys and girls. It is important not to forget that while White British FSM boys are the worst performing ethnic group (out of boys), White British FSM girls are the worst performing ethnic group (out of girls). The fact that White British FSM girls²⁴ do better than White British FSM boys is because of the main effect of gender. However, in the case of White British FSM girls this is hardly a protective factor as, although they are seven percentage points ahead of White British FSM boys, still only 31 percent of these girls will achieve 5+ A*-C GCSEs (see Figure 6-9).

²⁴ Gypsy/Roma and Travellers of Irish Heritage are in fact the worst performing groups at all Key Stages.

Figure 6-8 Gender x Ethnicity x FSM Interaction: Percentage of pupils gaining 5+ A*-C GCSEs (2006)

	Non-FSM			FSM		
	Boys	Girls	Gender Gap	Boys	Girls	Gender Gap
White						
White British	56.0	65.6	9.6	24.0	31.3	7.3
Irish	63.4	70.8	7.4	26.4	32.8	6.4
Traveller of Irish Heritage	22.2	41.7	19.5	0.0	3.0	3
Gypsy / Roma	10.9	15.7	4.8	6.9	5.8	-1.1
Any other White background	58.4	68.9	10.5	36.1	43.5	7.4
Mixed						
White and Black Caribbean	43.6	58.9	15.3	26.8	38.2	11.4
White and Black African	56.2	67.2	11.0	34.1	44.2	10.1
White and Asian	70.2	77.4	7.2	34.4	42.9	8.5
Any other mixed background	59.6	68.1	8.5	29.3	41.2	11.9
Asian						
Indian	69.2	78.3	9.1	48.3	62.6	14.3
Pakistani	48.9	60.5	11.6	37.8	52.4	14.6
Bangladeshi	52.8	64.4	11.6	48.2	59.7	11.5
Any other Asian background	60.6	75.0	14.4	45.3	59.5	14.2
Black						
Black Caribbean	38.8	55.9	17.1	27.1	41.6	14.5
Black African	50.6	62.9	12.3	33.7	44.5	10.8
Any other Black background	42.9	58.8	15.9	28.4	47.3	18.9
Chinese	75.8	84.9	9.1	65.0	80.0	15
Any other ethnic group	55.5	66.3	10.8	41.0	53.1	12.1
All Pupils	55.8	65.7	9.9	28.3	37.0	8.7

Source: SFR46/2006 National Curriculum Assessment, GCSE and Equivalent Attainment and Post-16 Attainment by Pupil Characteristics in England 2005/06 (Provisional), Additional Tables, issued December 2006

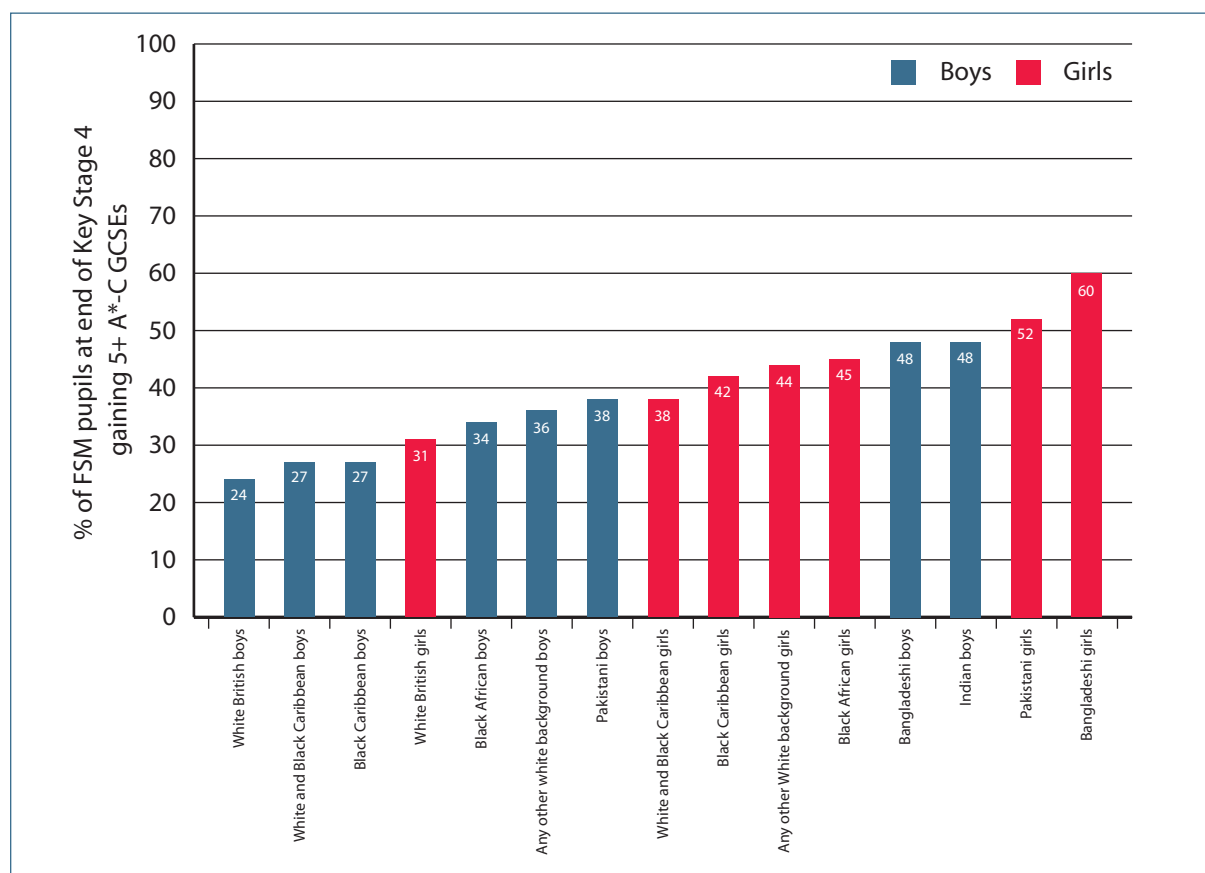
Figure 6-9 White British Attainment at GCSE by FSM and Gender (2006)

Note: Provisional data

Source: SFR46/2006 National Curriculum Assessment, GCSE and Equivalent Attainment and Post-16 Attainment by Pupil Characteristics in England 2005/06 (Provisional), Additional Tables issued December 2006

The following chart also shows the poor performance of White British FSM boys: only 24 percent gain 5+ A*-C GCSEs. It also shows that White British FSM girls are poor performers with only 31 percent gaining 5+ A*-C GCSEs. The achievement level for White British FSM girls is, when ranked, surrounded by male groups, suggesting an unusual pattern of attainment compared to other FSM girls who tend to be performing relatively better.

Figure 6-10 Percentage of Pupils with FSM Gaining 5+ A*-C GCSEs by Ethnic Group and Gender (2006)



Source: SFR46/2006 National Curriculum Assessment, GCSE and Equivalent Attainment and Post-16 Attainment by Pupil Characteristics in England 2005/06 (Provisional), Additional Tables issued December 2006
 Groups with fewer than 400 pupils are not shown

In summary:

- White British FSM boys are the worst performing group at GCSE. However, the effect of being White British combined with FSM is broadly similar for boys as girls. White British FSM girls do slightly better than their male counterparts because of the independent effect of gender which gives girls' higher scores.
- While these analyses of gender, social class and ethnicity have revealed some interesting patterns of performance, the most striking finding is that White British FSM boys, Black Caribbean FSM boys and White British FSM girls are all doing significantly less well than the national average, and the gap between them at GCSE is narrow (3 percentage points between White British FSM boys and Black Caribbean FSM boys and 4 percentage points between Black Caribbean FSM boys and White British FSM girls). In addition, the attainment of Black Caribbean non-FSM boys is well below the average.

6.5 The Interaction of Individual, School and Neighbourhood Level Deprivation

This section examines the interaction of different levels of deprivation and explores whether they, in turn, interact with gender and ethnicity. Different measures of deprivation help us to examine, for example, the impact of going to a school with a high proportion of children with FSM. The Venn Diagrams in Figure 6-12 explore these interactions in relation to deprivation at an individual, school or neighbourhood level and its impact on GCSE attainment²⁵.

There is a small compounded effect of being eligible for FSM and going to a school with high FSM: FSM pupils do 1-2 percentage points worse if they are also in a high FSM school. There is little difference if we look at boys and girls separately.

The effect of neighbourhood deprivation seems to exert a greater effect on White British FSM pupils than Black Caribbean pupils. White British FSM boys do 5 percentage points worse if they are also in neighbourhoods of high deprivation. White British FSM girls do 7 percentage points worse if they are also in neighbourhoods of high deprivation.

The pattern is reversed for Black Caribbean FSM pupils. Here, the neighbourhood effect is opposite i.e. for Black Caribbean FSM pupils (boys and girls), living in a deprived neighbourhood increases their likelihood of gaining 5+ A*-C GCSEs, compared to Black Caribbean FSM pupils who don't live in deprived neighbourhoods by 3 percentage points for boys and 13 percentage points for girls. Similar figures are apparent if one looks at Black Caribbean pupils who have all 3 measures of deprivation.

These findings on Black Caribbean pupils do need to be treated with some caution due to small numbers. Nonetheless, they do reflect the findings reported in the last section that there is a weaker relationship between FSM and ethnicity for Black Caribbean children than for White British children.

Figure 6-11 examines the gender gap for pupils either in all 3 deprivation categories or in none of them. Looking at all pupils, it is interesting to note that the gender gap is fairly similar for those in the "deprived" vs. "non-deprived" categories, with the gender gap in fact slightly larger for those in the "non-deprived" category. This confirms previous findings showing that deprivation does not "interact" to a great extent with gender.

Looking at the two ethnic groups, it can be seen that the effect of deprivation alone is much smaller for Black Caribbean pupils (boys and girls) than for White British boys and girls. While there is a reduced impact of deprivation on Black Caribbean pupils, there is an increased effect of gender on Black Caribbean boys and girls compared to White British pupils: the gender gap is larger for Black Caribbean pupils, underlining the particular under-achievement of Black Caribbean boys.

²⁵ Individual deprivation: pupil is eligible for FSM; school deprivation: school has a high proportion of pupils on FSM (13.3%+); area level: high IDACI (Income Deprivation Affecting Children Index) – school has a high proportion (13.3%+) of pupils that live in deprived areas.

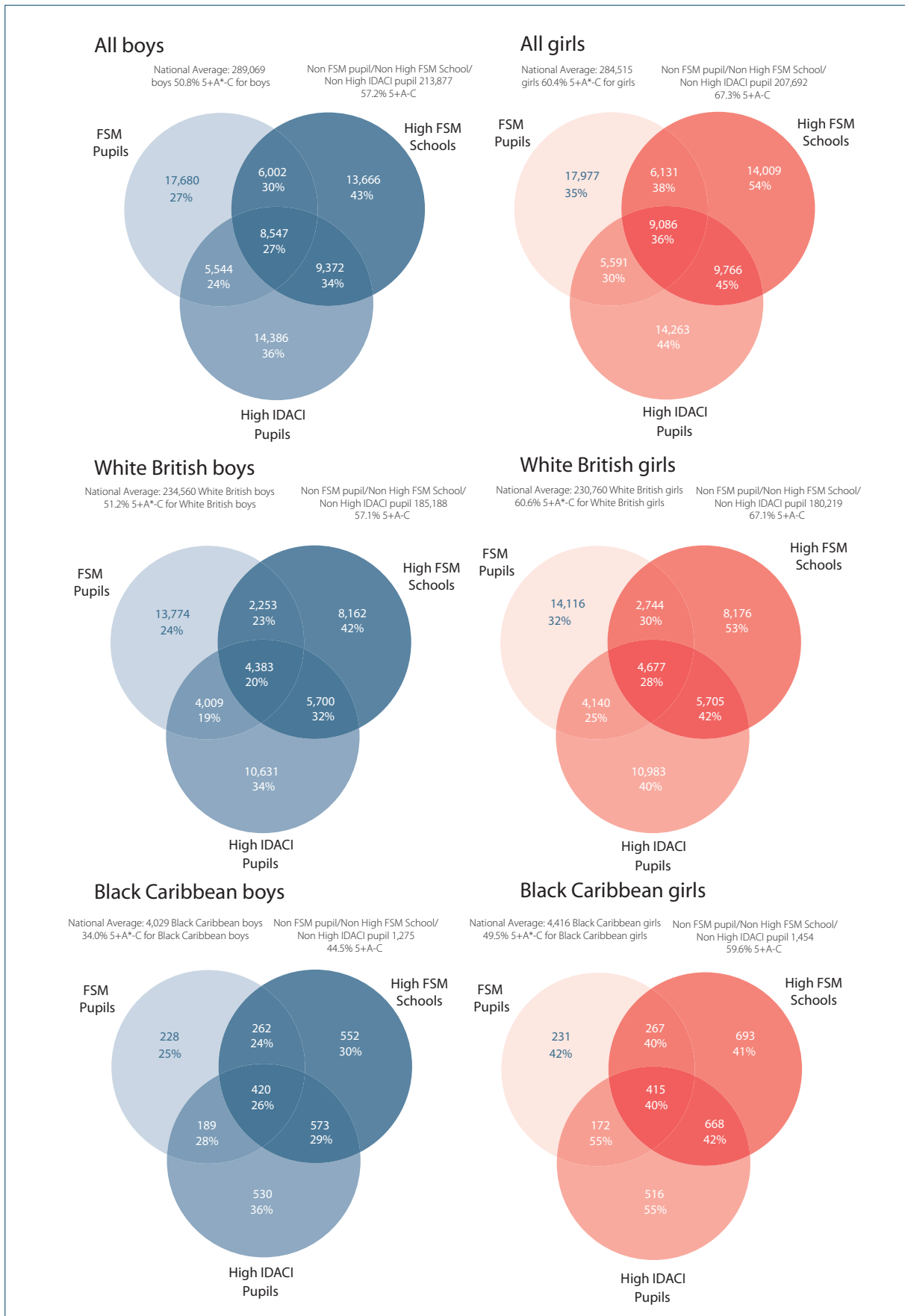
Figure 6-11 Gender x Deprivation Interaction: Percentage of Pupils Gaining 5+ A*-C GCSEs (2005)

	High Deprivation Areas		No Deprivation		High Deprivation Areas		No Deprivation		Boys	Girls
	Boys	Girls	Boys	Girls	Gender Gap (girls-boys)	Gender Gap (girls-boys)	Deprivation Gap (No-High)	Deprivation Gap (No-High)		
All Pupils	27	36	57	67	9	10	37	39		
White British	20	28	57	67	8	10	30	31		
Black Caribbean	26	40	45	60	14	15	19	20		

In summary, these findings confirm those in the previous section showing that deprivation appears to have a reduced impact on Black Caribbean pupils compared to White British pupils and that the interaction between overall gender and deprivation is negligible. The Venn diagrams show that:

- For a White British FSM pupil, attending a school with a large number of pupils with a high IDACI index has a greater negative impact on attainment at Key Stage 4 than attending a school with a large proportion of FSM pupils.
- In contrast, for a Black Caribbean FSM pupil, attending a school with a high number of IDACI pupils has a positive impact on attainment at Key Stage 4.
- Gender differences are constant i.e. there is no interaction between the different measures of deprivation and gender.

Figure 6-12 GCSE Achievement using Different Measures of Deprivation by Gender, FSM and Ethnicity (2005)



Source: National Pupil Database, unpublished DfES data, 2005

7 Has the Gender Gap Increased?

7.1 Introduction

This chapter discusses conflicting views on the best method for measuring the gender gap and how different methods can reveal different patterns in the extent of the gap and its change over time.

7.2 Key Findings

- Examining differences in percentage points between boys' and girls' attainment at 5+ A*-C GCSEs, the gender gap appears to have remained stable at around 10 percentage points over the last decade.
- There are methodological concerns about how one measures changes in the gender gap over time and whether percentage point difference really measures gender inequalities.
- Gorard (1999) has argued that the notion of an increasing gender gap is spurious because the standard measurement – percentage point difference – fails to take account of the data proportionately.
- However, Connolly (2006), comparing three measurements of the gender gap (percentage point difference, proportions and effect sizes) concludes that all three give broadly the same picture of changes over time.

A dramatic widening of the gender gap occurred in the late 1980s when looking at proportion of pupils gaining 5+ A*-C GCSEs (see Figure 3-7 which shows a negligible gender gap prior to the late 1980s). To some extent, this masked the fact that in individual subjects a gender gap (with a female advantage) has existed over many years in a number of subjects (e.g. English, English Literature, French, Religious Studies).

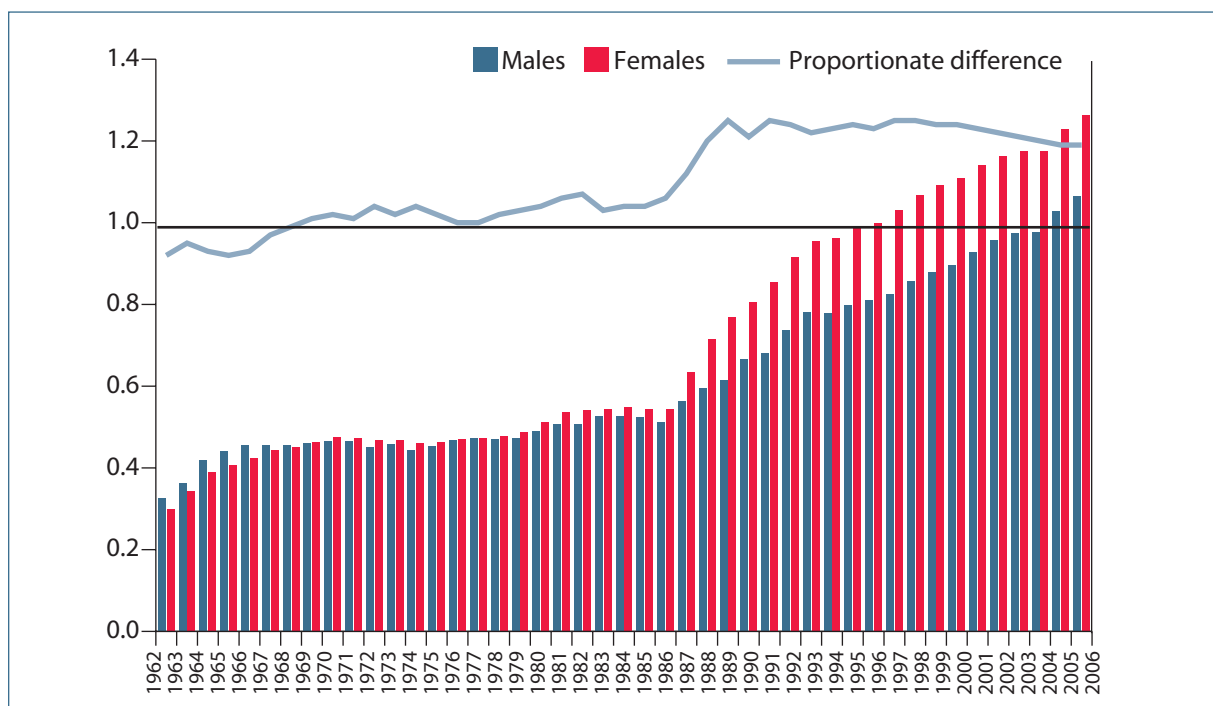
Nonetheless, the gender gap does seem to have increased further in some subjects since the 1980s. For example, the average gap in English widened from an average 9 percentage points in the 1980s to 16 percentage points in the 1990s. While some subjects showed a narrowing of the gap in the mid-70s to the mid-80s from the pattern in the 1960s, the gap then increased in English Literature, History, Religious Studies and French.

There has been debate by academics as to how to measure the gender gap. Percentage point difference and odds ratios are two ways of examining differences. Some consider the percentage point difference as a way of measuring the gender gap as spurious, resulting in

both policy intervention and media coverage that is not justified (Gorard, 1999²⁶). Gorard, who provided the key critique, argued that the data need to be looked at proportionately. For example, if 15 percent of girls and only 5 percent of boys reach a particular benchmark, this represents a 10 percentage point gender gap. Examined proportionately, girls are three times more likely than boys to reach the threshold (i.e. $15/5=3$). However, if 95 percent of girls and 85 percent of boys achieve the threshold, while there is still a 10 percentage point difference, the ratio has changed, so that girls are only marginally more likely to reach the threshold ($95/85=1.118$). This is a particularly important point because, in most subjects, the pass rate has increased for both boys and girls so that, while the gender gap (in percentage points) may have increased in some subjects, more boys and girls are doing well so the proportionate difference is decreasing.

The chart below illustrates this by plotting the gender gap in terms of boys' and girls' achievement at 5+ A*-C GCSE (which clearly shows the emergence of a gender gap in the 1980s) with a line showing the proportionate difference between boys' and girls' achievement (with 1 being no difference between the sexes). This line also shows that a gender disparity emerges in the 1980s (the line hovers around 1 before that). But this way of measuring gender differences reveals two observations: (1) the line has decreased slightly over the last few years as the result of the increased pass rate while the percentage point gap has remained stable; (2) the extent of the gender gap looks much less severe – girls are doing better than boys but the effect is not as dramatic as the bars indicate.

Figure 7-1 Gender Difference at O-level/GCSE and Proportionate Differences in Female/Male Achievement



²⁶ Gorard, S. (1999). Keeping a sense of proportion: the 'politician's error' in analysing school outcomes, *British Journal of Educational Studies*, 47, (3), 235-246.

Connolly (2006)²⁷, however, argues that a simple proportionate approach can also be misleading. Using the previous example: for an 85 (boys) and 95 (girls) percent pass rate, although the proportionate rate is less ($95/85=1.118$) than if the gap was for 5 and 15 percent ($15/5=3$), if one looks at those not reaching the threshold, the proportions look very different i.e. boys are now three times more likely not to reach the threshold than girls. Nonetheless, Connolly, assessing three methods of examining the gender gap (the percentage point difference, the proportionate approach and the use of effect sizes), concludes that all three paint broadly the same picture of changes over time i.e. that a growing gender disparity is apparent at GCSE, regardless of the way one measures the gap.

Previous sections have highlighted the importance of considering other factors that contextualise the gender gap (e.g. social class being much more strongly related to attainment than gender). This chapter has briefly reviewed measurement issues in ascertaining the extent of the gender gap and how it has changed over time. Changes in the gender gap as measured by percentage point difference appear to be exaggerated when one compares the gap with proportionate differences between boys and girls. Gorard's example suggests that the higher the pass rate, the smaller the gender gap. Nonetheless, gender gaps are apparent in some subjects and Chapter 14 explores the reasons why this gap has widened in some subjects.

²⁷ Connolly, P. (2006). Keeping a sense of proportion but losing all perspective: a critique of Gorard's notion of the 'politician's error', *British Journal of Educational Studies*, 54 (1), 73-88.

8 Is the Gender Gap in Attainment Important?

8.1 Introduction

Having established that there is a persistent and growing gender gap in some subjects, the question then arises as to whether this gap really reflects boys' underachievement and whether the gap is actually a cause for concern.

A number of researchers and commentators have criticised the notion of a simplistic gender gap. Connolly (2006) describes "the misleading and distorting nature of the moral panic" (p.3).

8.2 Key Findings

- The gender gap in attainment is smaller than the social class gap.
- A focus on the gender gap and boys' underachievement loses sight of the fact that large numbers of girls are also low attainers (116,000 girls and 153,000 boys did not gain 5+ A*-C GCSEs in 2006).
- The scale of these numbers is probably of greater importance than the proportionate difference between boys' and girls' attainment.

8.3 Underachieving Groups

As described in the previous chapter, other attainment gaps, the socio-economic gap and ethnicity gap (for certain ethnic groups), in particular, are arguably more important as the gaps are much wider than for gender. But do proportional differences reflect the actual numbers of children involved i.e. what are the relative scales of the problem?

If actual numbers of low attainers is considered there are many more low attaining boys (153 thousand)²⁸ not achieving 5+ A*-C GCSEs) than low attaining children with FSM (52 thousand)²⁹. But as the FSM/non-FSM category is such a blunt instrument (picking up the

²⁸ SFR01/2007 GCSE and Equivalent Examination Results in England 2005/06 (Revised), issued January 2007.

²⁹ SFR04/2007 National Curriculum Assessments, GCSE and Equivalent Attainment and Post-16 Attainment by Pupil Characteristics, in England 2005/06, issued February 2007.

most deprived families but not all families on a low income) it would be wrong to conclude that boys are a larger low attaining group than pupils from lower socio-economic groups³⁰.

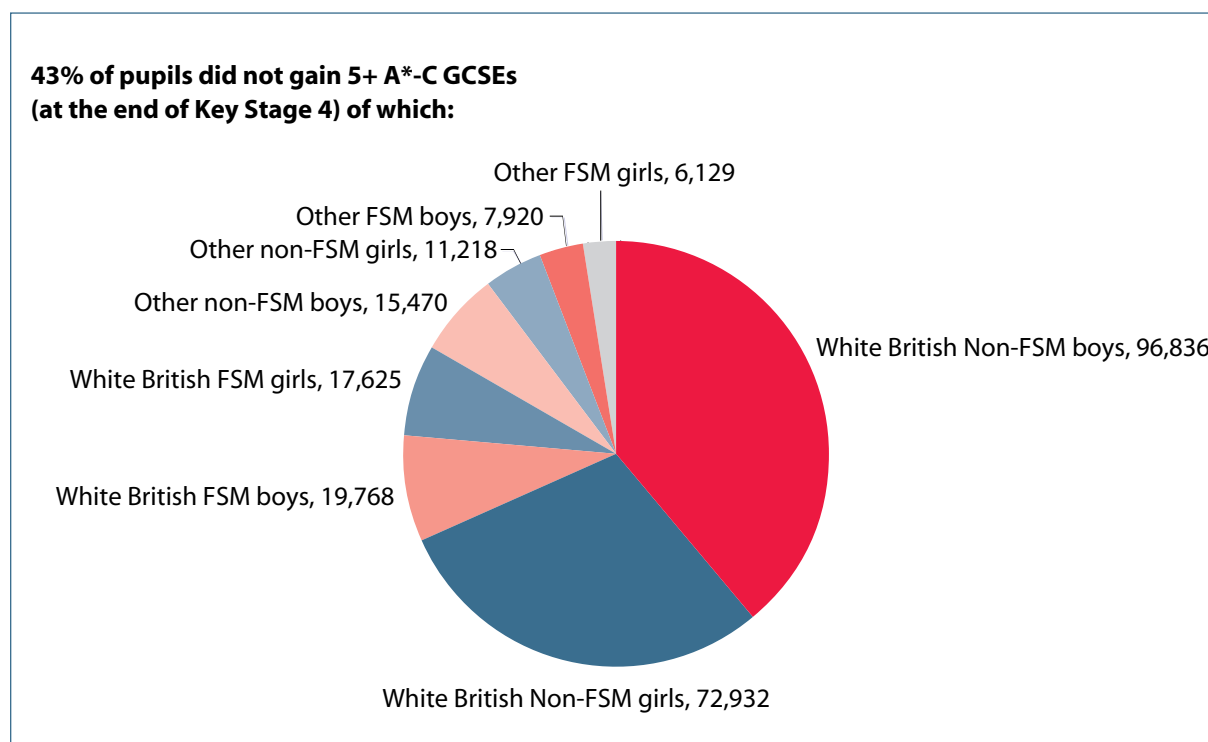
Moreover, a focus on boys and the gender gap can give the impression that the attainment of girls is not an issue as they “do better” than boys. A third of girls have low attainment on the GCSE threshold:

- 116 thousand girls (or 37 percent of girls) did not gain 5+ A*-C GCSEs in 2006 as well as 153 thousand boys (or 46 percent of boys).

The pie chart (Figure 8-1) illustrates this in more detail. The previous chapter explored whether White British FSM boys are at particular risk of underachievement. The chart shows that the largest numbers of pupils not attaining the GCSE benchmark are in fact non-FSM pupils. As stated above, this is partially a reflection of the FSM measure not being an effective marker of social class, with many non-FSM pupils having low incomes. Importantly, the chart shows that many girls are also low attainers: in particular, 17,600 White British FSM girls did not gain 5+ A*-C GCSEs (compared to 19,800 White British FSM boys).

In addition, the factors causing underachievement are not fully understood. Categorised as belonging to a lower social class, being male and being from certain ethnic groups are statistically associated with underachievement. However, Connolly (2006) found that the three variables (social class, gender and ethnicity) explained only about 10 percent of the variation in GCSE attainment i.e. we should not forget there are many other factors that impact on attainment either not covered by these variables or that are correlated with these factors.

Figure 8-1 Number of Pupils Not Attaining 5+ A*-C GCSEs (2006)



Source: SFR46/2006 National Curriculum Assessment, GCSE and Equivalent Attainment and Post-16 Attainment by Pupil Characteristics in England 2005/06 (Provisional), Additional Tables issued December 2006

³⁰ This is illustrated by the fact that Non-FSM children are the largest group of children not attaining 5 good GCSEs (over 200 thousand pupils) yet the YCS categories differentiate attainment amongst five occupational categories so social class is potentially still a variable that can identify low attainers.

In summary, three main caveats must be made about the gender gap:

- The gender gap arises mainly because of differences between boys and girls in language and literacy skills reflected in differences in performance in English and other subjects which are literacy based. The gender gap is small or negligible for Maths and Science. These general trends are very strong both from historical data going back 60 years and from international data.
- While gender does independently predict attainment, the social class gap has greater explanatory power.
- A focus on boys' underachievement loses sight of the fact that large numbers of girls are also low attainers. Tackling the scale of these numbers is arguably of greater priority and importance to policy makers than the proportionate difference between boys' and girls' attainment.

Studies referred to in Chapter 15, which discusses how to raise boys' underachievement, often conclude that successful approaches are likely to benefit both boys and girls. If this is the case, this may do little to close the gender gap but will, arguably more importantly, help raise the achievement of these large numbers of boys and girls.

Figure 8-2 Proportion and Numbers of Low Attainers at GCSE

	Percentage not achieving 5+ A*-C GCSEs (2006)	Number not achieving 5+ A*-C GCSEs (2006)	Percentage not achieving any GCSEs	Number not achieving any GCSEs (2003)
NATIONAL PUPIL DATABASE (2005)				
FSM (13%*)	67	52,318	12	9,920
Boys	71	28,162		
Girls	63	24,157		
Non-FSM (87%*)	39	200,661	4	20,230
Boys	44	114,743		
Girls	34	85,865		
Boys	46	153,123	7	19,070
White British FSM	76	19,768	17	4,450
White British Non-FSM	44	96,835	5	9,260
Black Caribbean FSM	73	746	10	109
Black Caribbean Non-FSM	61	1,944	7	208
Girls	37	116,207	4	12,440
White British FSM	69	17,625	12	3030
White British Non-FSM	34	72,932	3	6,380
Black Caribbean FSM	58	616	5	59
Black Caribbean Non-FSM	44	1,469	4	120
YOUTH COHORT STUDY (2004)				
Higher Professional (18%*)	23		2	
Lower Professional (26%*)	35		2	
Intermediate (22%*)	47		2	
Lower Supervisory (9%*)	60		3	
Routine (13%*)	67		7	
Other (12%*)	67		9	
Boys	51			
Higher Professional	28		3	
Lower Professional	41		2	
Intermediate	51		3	
Lower Supervisory	65		4	
Routine	73		7	
Girls	41			
Higher Professional	19		1	
Lower Professional	29		2	
Intermediate	43		2	
Lower Supervisory	53		3	
Routine	62		7	
At least 1 parent with a degree	27		3	
At least 1 parent with an A-Level	36		2	
Neither parent with an A-Level	59		5	

Note: *the proportion of each of the categories is shown in brackets

Source: SFR 04/2004 The National Curriculum Assessment and GCSE/GNVQ Attainment by Pupil Characteristics, in England, 2002 (final) and 2003 (provisional), issued February 2004

SFR 04/2005 Youth Cohort Study: The Activities and Experiences of 16 Year Olds: England and Wales 2004, issued February 2005

SFR46/2006 National Curriculum Assessment, GCSE and Equivalent Attainment and Post-16 Attainment by Pupil Characteristics in England 2005/06 (Provisional), issued November 2006

SFR04/2007 National Curriculum Assessments, GCSE and Equivalent Attainment and Post-16 Attainment by Pupil Characteristics, in England 2005/06, issued February 2007

8.4 Equality in the Labour Market

The gender gap at school can be interpreted in different ways. On the one hand, it can be seen to highlight that boys are more likely than girls to underachieve or not fulfil their potential during compulsory schooling (particularly in certain subjects). On the other hand, the gender gap could show, not the greater underachievement of boys, but a kind of ‘over-achievement’ of girls who are doing especially well.

One way to examine this issue is to look at the longer term outcomes of pupils after they leave school. If the purpose of equality in gaining educational qualifications is to ensure equality of opportunity in the labour market, then the importance of the gender gap in education can be assessed in relation to labour market outcomes. In other words, it could be argued that the widening gender gap does not matter if this advantage either disappears by the time the girl enters the labour market or if it helps to ensure greater equality for women in the labour market.

There is evidence, for example, that the earnings gap in full-time work has reduced considerably in the last 30 years. In 1970, the ratio of women’s to men’s average earnings was 63 percent. In 2004, this had increased to 82 percent³¹. It has been argued that the increasing education gender gap has had an impact on such subsequent labour-market outcomes (Andrews et al, 2006³²). In this sense, the gender gap in girls’ favour, could be one factor helping to address some of the inequalities that women have traditionally encountered in the labour market. As our analysis has shown, the closing of the gender gap in maths (where boys traditionally did better) could have important implications for wage earning, as Andrews et al (2006) note that maths skills have a higher knock-on effect on wages compared to other skills. In contrast, boys’ disadvantage in English and related subjects may have less significance for wage earning potential.

However, the fact that girls are much less likely to choose to study Maths A-Level (39 percent of entries) or Physics A-Level (21 percent of entries) suggests that the different subject choices made by boys and girls may be much more significant in relation to career paths and future earnings than the gender gap in attainment.

The link between the gender gap and improving opportunities for women in the labour market is not proven. However, if education is the key to improving remaining labour market inequalities, then addressing the gender gap in attainment may be arguably less important than tackling continuing and entrenched gender differences in subject choice (which impact on career paths and subsequent wage potential, particularly affecting women). Nonetheless, addressing low attainment at school (with boys more likely than girls not to reach established thresholds of attainment) remains a primary policy objective so that all pupils can achieve their potential.

³¹ Key Indicators of women’s position in Britain, Institute for Employment Studies/Women and Equality Unit, 2004.

³² Andrews, M. Bradley, S., Stott, D. & Taylor, J. (2006). The evolution and determinants of the educational gender gap in England, unpublished.

9 Pre-School Differences

9.1 Introduction

Having described gender differences from 4-18 years through analyses of Foundation Stage and Key Stage data, this chapter summarises research showing that gender differences are apparent very early in children's development. Developmental differences in infancy are described, followed by pre-school differences. These show that from very early on girls show better skills than boys in language and communication.

9.2 Key Findings

- Data from the Millennium Cohort Study suggest gender differences are apparent in early communicative gestures at 9 months old, with, for example, female infants more likely to wave goodbye. However, for the majority of measures, small or negligible gender differences were found.
- At pre-school, girls have better social and cognitive skills.
- Parents are more likely to read and teach songs and nursery rhymes with their daughters than their sons.
- Pre-school provision helped boost boys' early number concepts but had no differential impact on early literacy skills.

9.3 How Early Are Differences Observed?

Differences between boys and girls are evident very early on in development. Findings from The Millennium Cohort Study³³ found that girls aged 9 months were slightly more advanced than boys in some aspects of fine motor coordination. For example, 64 percent of girls will reach out and give an adult an object they are holding, compared to 55 percent of boys. Differences are also noticeable in communicative gestures: 45 percent of girls wave goodbye on their own when someone leaves, in comparison to 30 percent of boys. However, on many measures there are no differences or very small differences (e.g. gross motor skills; temperament). Recent theories of gender differences point to variation in testosterone exposure (during gestation and shortly after birth) as a cause of early gender differences such

³³ The Millennium Cohort Study is a large-scale survey of the new century's babies, and the families who are bringing them up, for the four countries of the United Kingdom. Its first sweep was carried out during 2001-2002 and contains information about 18819 babies in 18553 families, collected from parents when the babies were aged nine months. Dex, S. & Joshi, H. (2004) Millennium Cohort Study First Survey: A User's Guide to Initial Findings.

as a one-day-old girl looking at a face longer than at a mechanical mobile while a boy will prefer the mobile³⁴.

9.4 Differences at Pre-School

Findings from the longitudinal study, Effective Provision of Pre-School Education³⁵, which followed a cohort from age 3 to 7, indicated there were significant gender differences in young children's intellectual and social behavioural development at entry to pre-school.

Girls generally showed better social development than boys, especially in co-operation/conformity and independence and concentration. Girls also showed higher attainment on all cognitive outcomes.

Girls made greater gains in pre-reading, early number concepts and non-verbal reasoning than boys over the pre-school period.

The researchers also found that the pre-school home learning environments differed for boys and girls. Significantly more girls' parents reported activities such as reading, teaching songs and nursery rhymes. It was not possible to establish whether these self-reported differences in parenting reflected different expectations of boys and girls, and/or gender differences in the behaviours and interests of pre-school children.

Notwithstanding, some aspects of the home learning environment measured during the pre-school period showed significant independent positive effects on attainment and social behaviour at age 7 years (end of Key Stage 1). Therefore some of the gender differences in cognitive and social/behavioural outcomes at primary school entry and beyond may in part be attributed to differences in the quality of home learning environment.

In terms of the effect of pre-school provision, the study found that boys particularly showed greater progress in early number concepts if they attended high quality pre-school provision. Given that, as a group, girls made greater cognitive gains and had higher attainments at entry to pre-school in most areas, the positive impact of pre-school quality for boys' progress in early number concepts is of special interest. Although this suggests that raising the quality of pre-school provision may help promote boys' attainment levels in early maths skills, the fact that it did not boost early literacy skills is disappointing for addressing the area of greatest gender disparity.

³⁴ The Mismeasure of Woman (2005), The Economist.

³⁵ The Effective Provision of Pre-School Education (EPPE) project is a longitudinal study of a national sample of over 3000 young children and their parents examining the children's development (intellectual and social/behavioural) between the ages of 3 and 7 years. Children attended a range of pre-school settings (141) (local authority day nursery, integrated centres, playgroups, private day nurseries, maintained nursery schools and maintained nursery classes plus a group who had no or minimal pre-school experience).
Sylva, K., Melhuish, E., Sammons, P., Siraj-Blatchford, I. & Taggart, P. (2004) *Effective Provision of Pre-School Education (EPPE) Project: Final Report – A Longitudinal Study* Funded by the DFES 1997-2004.

10 Cognitive Differences

10.1 Introduction

Chapters 3-5 looked at attainment as measured by school assessments. Gender differences in early development have also been described. School assessments are designed to assess learning rather than underlying ability so this chapter examines the evidence on whether there are gender differences in assessments of mental ability or IQ which aim to assess underlying ability or potential.

10.2 Key Findings

- Research shows small or negligible overall gender differences on IQ tests and tests of reasoning.
- Girls do better on verbal reasoning tests.
- Boys show greater variability on their test scores i.e. there are more boys in both the extreme low and extreme high range of scores.
- The relatively small gender differences in verbal reasoning does not seem to predict the large gender differences found in English and other humanity subjects in National Curriculum Assessments.

10.3 Gender Differences in IQ Tests

There has been much debate about the extent or even existence of sex differences in IQ tests and tests of reasoning (Strand, Deary & Smith 2006³⁶). Strand et al. (2006) argue that much research has shown small or negligible differences between the sexes.

Their own analysis supports this. They examined verbal, quantitative and non-verbal reasoning data in a large UK sample of 11-12 year olds (Cognitive Abilities Test (CAT) scores). The differences between boys and girls were very small for non-verbal and quantitative reasoning. For verbal reasoning, girls did perform better – they were an average of 2.2 standard age score points ahead of boys. However, Strand et al. caution that this is still a relatively small difference³⁷. Strand et al. acknowledge that construction of these tests do undergo a procedure that eliminates items that could create gender bias and therefore can reduce overall score differences.

³⁶ Strand, S., Deary, I.J. & Smith, P. (2006). Sex differences in Cognitive Abilities Test scores: A UK national picture, *British Journal of Educational Psychology*, 76, 463-480.

³⁷ An effect size of only 0.15.

A second finding of Strand et al., in line with other studies, is that boys tend to show greater variability in their test scores i.e. that there are more boys than girls in both the extreme low and extreme high range of possible scores (this was least pronounced for verbal reasoning).

The CAT scores used in this study correlate strongly with subsequent Key Stage 3 and Key Stage 4 attainment. However, the small gender differences observed in CAT are not in line with some of the large gender differences in Key Stage tests. The relatively small gender difference in verbal reasoning found in this and other studies does not seem to predict the large gender differences in English and other humanity subjects found in National Assessments. Therefore, gender differences must reflect factors not measured through CAT, like the mode of assessment, a pupil's attitudes or subject choices.

Strand et al's finding that boys show greater variability in reasoning scores may partly explain boys' greater representation within populations of special educational needs or those failing to achieving any GCSE passes but is not reflective of gender patterns at the higher end of attainment where the findings generally show girls doing better (except for Maths Key Stages 1-3).



11 International Evidence

11.1 Introduction

This chapter reviews evidence from the Programme for International Student Assessment (PISA) which provides interesting data on the gender gap across countries in the OECD (Organisation for Economic Co-Operation and Development) and their partners.

11.2 Key Findings

- Overall, PISA found that girls generally outperformed boys in reading while boys tended to outperform girls in maths. The differences, however, between boys and girls were much greater for reading than for maths, which were relatively small.
- In Maths, boys were significantly ahead of girls in half the participating countries. In literacy, girls scored significantly better than boys in all but one participating country.
- There were no systematic gender differences in Science.
- Looking at the gender gap for England, the findings show that there was no statistical difference between boys and girls in maths. Alongside the majority of countries, the gender gap in literacy was statistically significant for England but was smaller than the OECD average.
- Gender differences in problem solving were mainly minor, and in most cases not statistically significant. However, boys showed a greater range of performance in problem solving than girls: more boys were among both the higher and the lower performers. In fact, males had a greater range of performance in every participating country apart from Indonesia.
- The PISA study has also highlighted differing trends in learning style. Girls were more likely to control their learning (i.e. review what they had learned; review what they still need to learn) in all but four OECD countries.
- Motivation also shows contrasting gender differences. In most countries, girls claimed more effort and persistence and expressed significantly greater interest in reading. Boys showed significantly more interest in Maths in most countries – by small degrees in some countries, but by much more in others.

11.3 Background to PISA

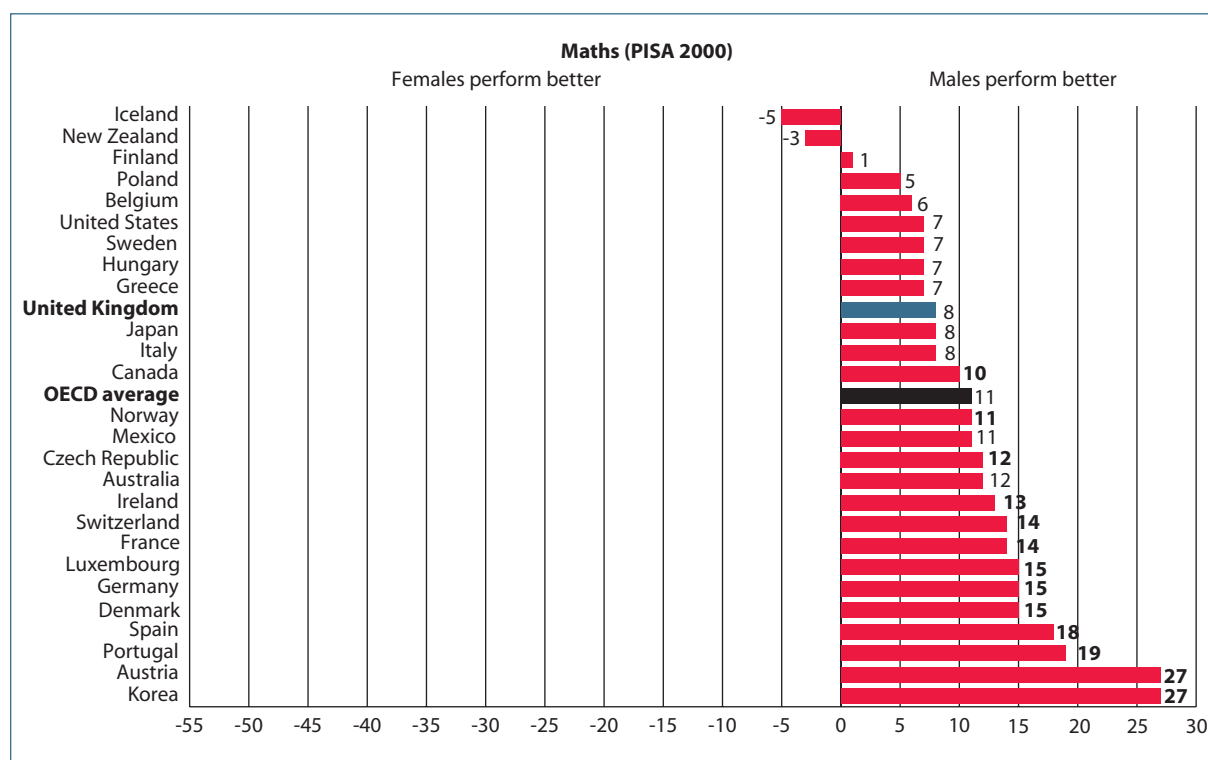
PISA (Programme for International Student Assessment) assesses 15 year old students across a range of skills in a large number of countries. In 2000, 41 countries, including the UK, took part; in 2003, 43 countries took part³⁸. The 30 member states of the OECD (Organisation for Economic Co-operation and Development) usually take part as well as other partner countries. The survey covers maths (the main focus in 2003), reading, science and problem solving. This section will review both 2000 and 2003 findings³⁹.

11.4 Maths

Small gender differences, consistent across OECD countries

In PISA 2000, in half the countries, boys were ahead in Maths by an average of 11 points (this is a smaller difference than reading – see below). In the other half, there was no significant gender difference. The United Kingdom had a male advantage of 8 points, which was not significant.

Figure 11-1 International Comparison of Maths Scores by Gender (PISA 2000)



Statistical differences are marked by bold numbering

³⁸ Individual results from England (2003) were excluded from the OECD main report as response rates were too low.

³⁹ *Knowledge and Skills for Life: First Results for the OECD Programme for International Student Assessment, 2000*, OECD.
Learning for Tomorrow's World: First Results from PISA 2003, OECD.

These findings were replicated in the 2003 dataset. Gender differences tended to be small for maths, and the pattern of performance was fairly consistent across OECD countries, with the largest gender difference being in the maths/space and shape scale⁴⁰ where there was a small gender gap in 26 of the 30 OECD countries. There was also consistently better performance of boys in the maths/uncertainty scale (measuring probability and statistics) in 24 of the 30 OECD countries. Interestingly, Iceland was the only exception where girls performed consistently better than boys in Maths.

More boys amongst higher performers

The majority of countries had more boys among top performers, which resulted in the slight overall advantage for boys over girls in average terms. However, boys and girls tended to be equally represented among the low-performers.

Gender differences were larger within schools than they were overall. Girls were more likely to attend the higher performing, academically oriented tracks and schools at a higher rate than boys but, within schools, girls often performed significantly below boys.

Gender differences in maths not inevitable

While gender differences were found in many countries, several countries showed no overall differences, which suggests that some countries do provide a learning environment that benefits both genders equally, while other countries do not. Indeed, according to the PISA 2000 results, England was one of the countries where there was no significant difference between boys and girls.

Girls report lower interest and enjoyment in maths

Girls consistently reported much lower interest in and enjoyment of mathematics, lower self-related beliefs and much higher levels of helplessness and stress in mathematics classes, despite overall gender differences in performance being small.

11.5 Reading

Large gender difference across all countries

Girls showed significantly higher average reading performance than boys in every country in PISA 2000 and 2003 (except in the partner country Liechtenstein in 2003). The female advantage in reading is generally greater than the male advantage in mathematics: on average it is 34 points, or half a proficiency level (this was 32 points in PISA 2000). However, the difference ranges from 58 points in Iceland to 21 points in Korea, Mexico and the Netherlands and 13 points in the partner country Macao-China.

The gender gap for the UK (in 2000) was smaller than the OECD average. For some countries who perform very well overall, the gender gap was smaller than average (Korea); for others, the gender gap was significantly larger than average (Finland).

In the majority of countries, boys were significantly more likely than girls to be among the lowest performing students. In 12 OECD countries, boys were at least twice as likely as girls to score one standard deviation below the average; in Finland and Iceland, this was three or more times as likely.

⁴⁰ This requires students to recognise similarities and differences in the shapes of objects when presented in different representations and in different dimensions, as well as the concepts of relative position and movement.

Figure 11-2 International Comparison of Literacy Scores by Gender (PISA 2000)

Statistical differences are marked by bold numbering

Findings from PISA 2000 (where reading was the focus) indicate that the greater gender differences in reading were on tasks requiring critical evaluation and relating of text to personal experience, knowledge and ideas (an average of 45 points difference on the reflection and evaluation scale in favour of girls, compared to 29 points difference on the interpretation scale and 24 points on the retrieving information scale).

In all OECD countries, boys are more likely than girls to be among the lowest performing students in reading.

Gender differences were reported on young people's enjoyment of reading. On average across OECD countries, 46 percent of boys said they read only if they had to, compared to 26 percent of girls. Forty-five percent of girls reported that they read for enjoyment for more than 30 minutes each day compared to 30 percent of boys.

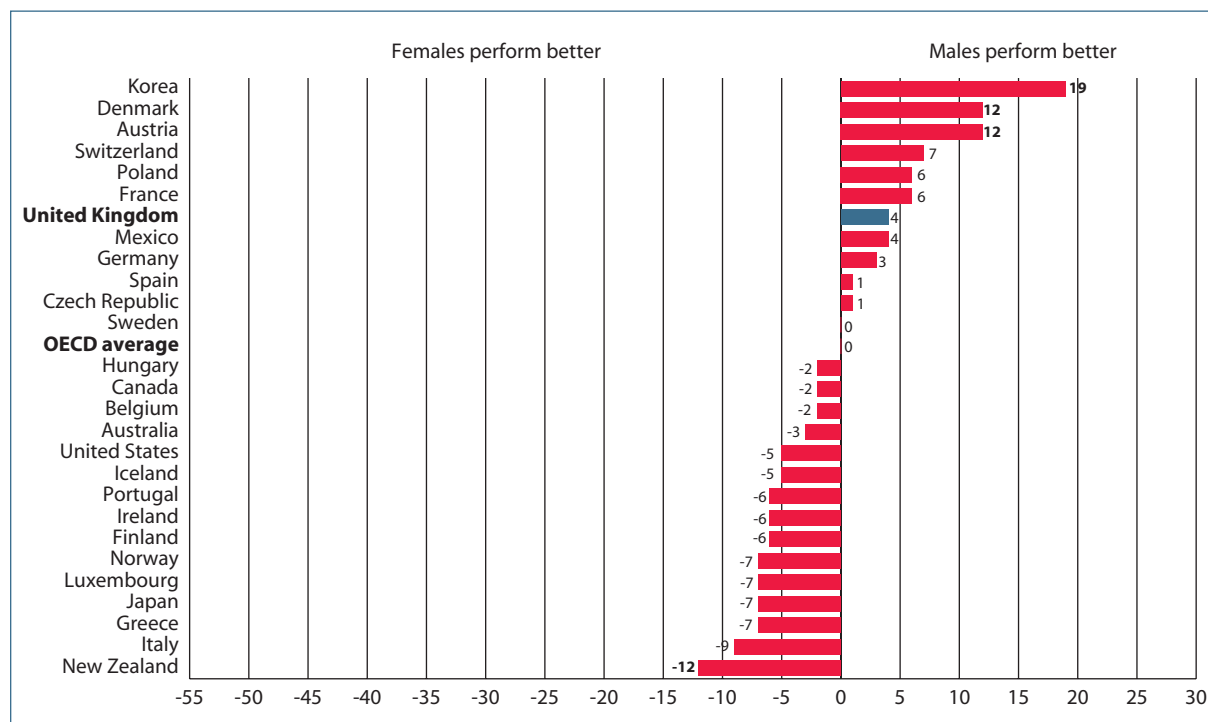
Gender differences also emerged for type of reading undertaken. Girls were more likely than boys to read fiction (37 percent of girls several times per month or per week compared to 19 percent of boys). Boys were more likely than girls to read newspapers (68 percent of boys several times per month or per week compared to 24 percent of girls) and comic books (35 percent of boys compared to 24 percent of girls).

11.6 Science

No significant gender differences

There were no systematic differences between the performances of males and females in science in PISA 2003. In the minority of countries where gender differences existed, they were small. Moreover, similar proportions of males and females achieved particularly high and particularly low results in science.

Figure 11-3 International Comparison of Scientific Literacy by Gender (PISA 2000)



Statistical differences are marked by bold numbering

11.7 Problem Solving

Boys have a greater range of performance than girls – more likely to be either very good or very poor at problem solving

In PISA 2003, gender differences in problem solving were mainly minor, and in most cases not statistically significant. However, boys showed a greater range of performance in problem solving than girls: more boys were among both the higher and the lower performers. In fact, males had a greater range of performance in every participating country apart from the partner country Indonesia.

These results imply that both boys and girls bring particular strengths to problem solving. Problem solving may serve as an indicator of the extent to which gender differences exist beyond the context of a curriculum subject. In countries with a relatively strong gender advantage either for boys in mathematics or girls in reading, there sometimes remains a smaller but statistically significant gender difference in a similar direction in problem solving.

On the other hand, in Italy and Greece, for example, both the male advantage in mathematics and the female advantage in reading were relatively large, but problem-solving performance was the same, suggesting that the gap was due to gender-typical characteristics of particular curriculum areas.

12 Special Educational Needs

12.1 Introduction

This chapter examines data on the different identification rates of special educational needs for boys and girls.

12.2 Key Findings

- Boys are more likely than girls to be identified with special educational needs and more likely to attend special schools. Boys make up 70 percent of those identified with special educational needs.
- Boys are nine times as likely as girls to be identified with autistic spectrum disorder.
- Boys are four times as likely as girls to be identified as having a behavioural, emotional and social difficulty (BESD).
- Gender is a better predictor than social class and ethnicity of being classified as having BESD.
- Boys from Black Caribbean, White/Black Caribbean and any other Black background are the groups proportionately more likely to be identified with BESD.

12.3 Gender Differences in Identification of Special Educational Needs (SEN)

There are gender differences in the proportion of pupils identified with special educational needs. The most recent figures (2006)⁴¹ show that:

- Twelve percent of boys were identified as having a special educational need (either a statement or SEN without a statement) compared to five percent of girls.
- Boys make up 70 percent of those identified with special educational needs.
- In primary and secondary schools the incidence of pupils identified with SEN without statements was greater for boys (around one in every five boys) than it was for girls (almost one in every eight girls).
- The incidence of pupils with statements of SEN was nearly three times higher for boys than it was for girls. In 2006, almost 100,600 boys in primary and secondary schools had statements of SEN (around one in every 37) compared with 38,200 girls (around one in every 100). Sixty four percent of pupils with SEN (no statement) and 73 percent of pupils with SEN (statement) were boys.

⁴¹ SFR 23/2006 Special Educational Needs in England, January 2006, issued June 2006.

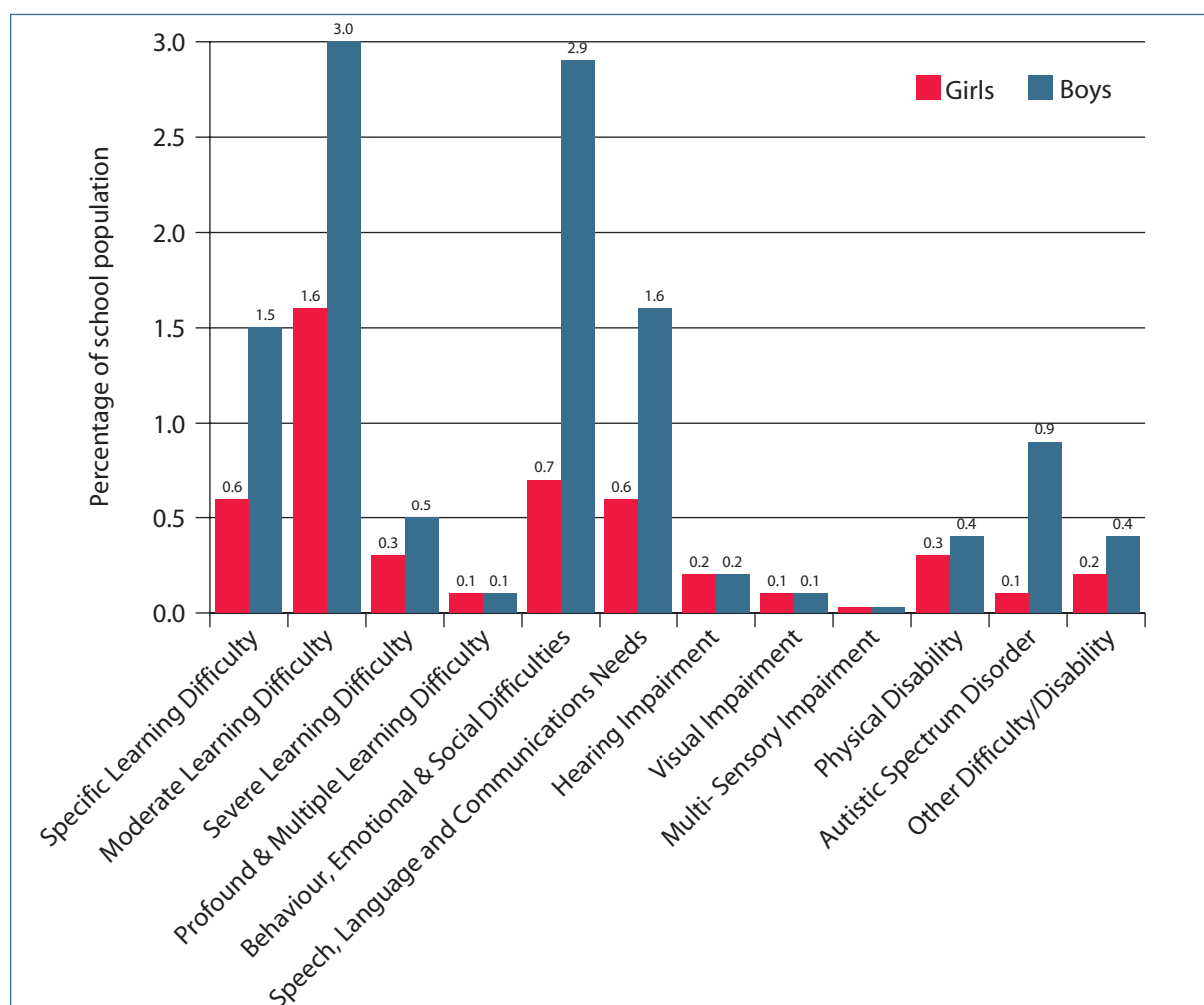
- There was also a much higher proportion of boys than girls in special schools: seventy percent of pupils attending special schools were boys⁴².

There were also gender differences when looking at the type of special educational need. As Figure 12-1 illustrates, the most striking findings are that boys were more likely to be classified as having:

- An autistic spectrum disorder (9 times as likely as girls)
- A behavioural, emotional and social difficulty (4 times as likely as girls)
- A specific learning difficulty (2.7 times as likely as girls)
- A speech, language and communication need (2.5 times as likely as girls).

There was no over-representation of boys in sensory or physical types (e.g. hearing impairment or physical disability).

Figure 12-1 Incidence of SEN Type by Gender Across Primary, Secondary and Special Schools (2006)



Note: Includes pupils with statements of SEN and pupils at School Action Plus
Source: DFES PLASC data

⁴² SFR 19/2006 Pupil Characteristics and Class Sizes in Maintained Schools In England, January, 2006 (provisional), issued April 2006.

12.4 Is There a Gender Bias in Identification of SEN?

The data show gender differences but it is not clear whether this is due to differences in incidence of SEN or differences in the way boys and girls are identified and referred. Dockrell, Peacey & Lundt (2003)⁴³, in a review of the literature, suggest that girls may indeed be disadvantaged in terms of not being identified as having a special educational need i.e. the greater male incidence of SEN in the figures may be a result, not only of the nature of the population, but also gender bias in teacher and professional referral.

12.5 Interaction with Social Class and Ethnicity

It is also important to note that other factors such as social class and ethnicity are associated with SEN and can interact with gender.

Lindsay, Pather & Strand (2006)⁴⁴ examined the relative association of different factors with the identification of SEN. They used stepwise logistic regression to examine which factors (gender, ethnicity, social class, year group) were most clearly associated with SEN overall and with the two most frequent SEN types: moderate learning difficulty (MLD) and behaviour, emotional and social difficulties (BESD).

For overall SEN and for BESD, gender was the most important factor and best predictor of whether a child was identified with SEN/BESD (i.e. social class and ethnicity weren't as good predictors). For MLD, FSM was a better predictor than gender (and ethnicity).

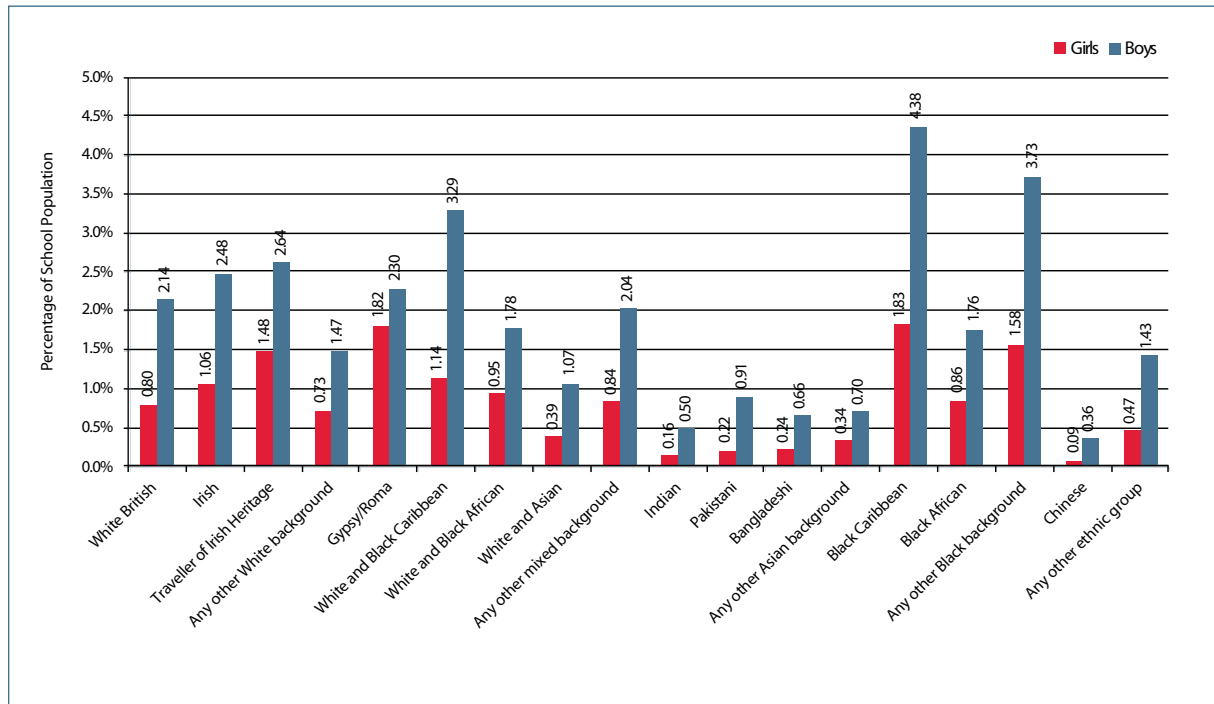
Nonetheless, it should be noted that boys from particular ethnic groups may be more likely to be identified with a particular type of SEN (see Figures 12-2 and 12-3). In relation to the two main categories of MLD and BESD, boys from Black Caribbean, White/Black Caribbean and any other Black background were the groups most likely to be identified with BESD and, in addition, were the groups with the largest gender gaps. Apart from the two traveller groups (where numbers are very small), Black Caribbean boys were also the most likely to be identified as MLD, and, again, have the largest gender gap.

In summary, boys were more likely to be identified with BESD and gender is the best predictor of this classification. The next chapter continues to explore behavioural issues.

⁴³ Dockrell, J., Peacey, N. & Lundt, I. (2003). *Literature Review: Meeting the Needs of Children with Special Educational Needs*, the Audit Commission.

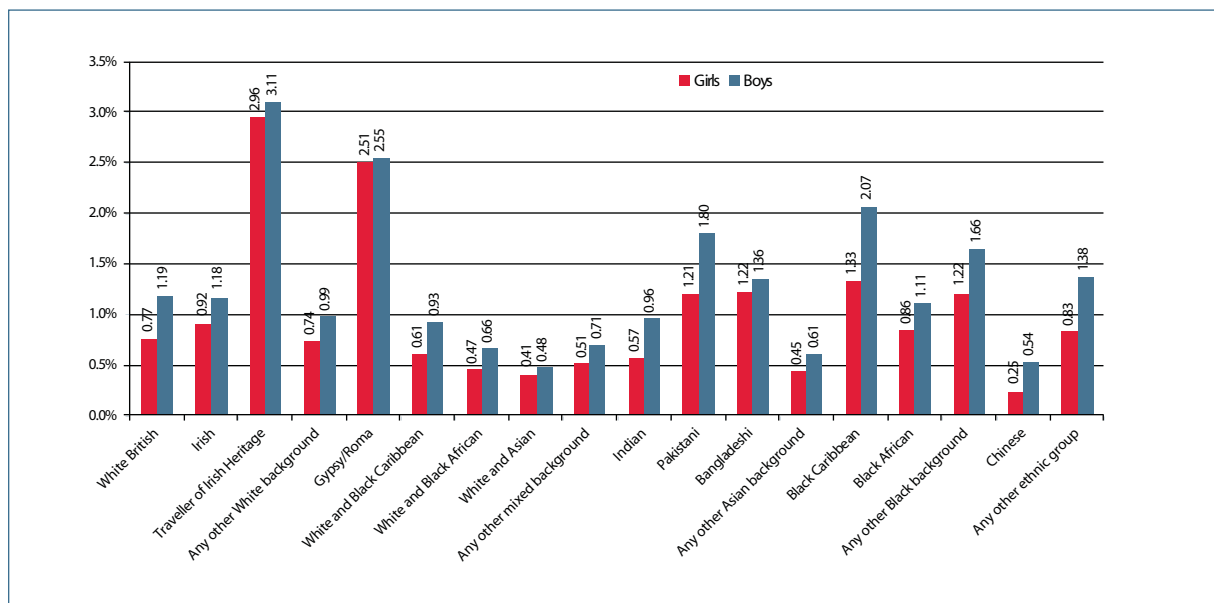
⁴⁴ Lindsay, G., Pather, S. & Strand, S. (2006). *Special Educational Needs and Ethnicity: Issues of Over-Representation and Under-Representation*, DfES RR757.

Figure 12-2 Percentage of Pupils Identified with Behavioural, Emotional and Social Difficulties by Gender and Ethnicity (School Action Plus, Secondary School, 2004)



Source: DfES unpublished statistics from PLASC

Figure 12-3 Percentage of Pupils with Moderate Learning Difficulty by Gender and Ethnicity (School Action Plus, Secondary School, 2004)



Source: DfES unpublished statistics from PLASC

13 Behaviour and Disaffection

13.1 Introduction

This chapter summarises data on gender differences for exclusions, truancy, bullying and youth offending.

There appear to be no great differences between boys and girls in their attitude to school. As part of the Longitudinal Study of Young People in Education (LSYPE) survey⁴⁵, young people were asked to rate twelve items related to attitudes to school (such as: I am happy when I am at school; School is a waste of time for me; School work is worth doing). A composite score found no meaningful difference between boys and girls. An examination of the lowest scoring 10% (the anti-school group) also found no gender differences.

Disaffection is likely to manifest differently for boys and girls. An obvious example is that a girl's disaffection with school and education might manifest itself through her getting pregnant: there is a strong association between low educational attainment and higher teenage conception rates⁴⁶. For boys, the pathway may be through crime.

13.2 Key Findings

- There are no gender differences in pupils' attitudes towards school but there is evidence that boys and girls who become disaffected tend to take different pathways.
- Boys account for eighty percent of permanent exclusions and three quarters of fixed period exclusions.
- There has been an increase in the proportion of girls receiving permanent exclusions over the last seven years: in 1998, girls accounted for 16 per cent of all permanent exclusions; the most recent figures show that they now account for 21 per cent of all exclusions. This is due to a decline in the percentage of boys receiving exclusions while the percentage of girls receiving exclusions has remained relatively stable.
- There is little variation in the exclusion rates of boys and girls across ethnic groups. Boys from White, Black and Mixed backgrounds are excluded (both fixed period and permanent) at approximately 2.6-3.5 times the rate of girls. There is a greater gender disparity for Asian pupils.

⁴⁵ Next Steps, Longitudinal Study of Young People (LSYPE), DfES, unpublished (2004 data).

⁴⁶ Teenage Pregnancy Next Steps: Guidance for Local Authorities and Primary Care Trusts on Effective Delivery of Local Strategies, DfES 2006.

- FSM pupils are three times more likely to receive an exclusion (fixed period or permanent) than non-FSM pupils. The increased rate is similar for both FSM boys and FSM girls. As boys overall have a higher rate of exclusions, the rate for FSM boys is high: the proportion of fixed period exclusions is 18 percent for FSM boys compared to 7 percent for non-FSM boys. The comparable figures for girls are 6 percent (FSM girls) and two percent (non-FSM girls).
- Girls have slightly higher rates of authorised absence than boys but there are no gender differences in unauthorised absence.
- Higher than average levels of absence (authorised and/or unauthorised) are associated with reduced attainment at Key Stage 3 and GCSE, with a particular impact on boys.
- Girls are more likely than boys to have been the victim of psychological bullying while boys are more likely than girls to have been the victim of physical bullying.
- Boys are more likely to have committed a criminal offence than girls (33 percent compared to 21 percent).

13.3 Exclusions

There is a greater proportion of permanent and fixed period exclusions reported for boys. Boys account for eighty percent of permanent exclusions and three quarters of fixed period exclusions. Half of all permanent exclusions are applied to boys for carrying out either a physical assault against a pupil or adult, or for persistent disruptive behaviour (see Figures 13-1 and 13-2).

There are also interesting patterns by ethnic group, FSM status and gender (see Figure 13-3 and Figure 13-4):

- In 2005, the rate of fixed period exclusion for Mixed boys was similar to that for Black boys (around 11 percent). This was slightly higher than that for White boys (some eight percent) which was around twice that for Asian boys (just over four percent).
- Boys are three and a half times more likely than girls to receive a permanent exclusion and three and a half times as likely to receive a fixed period exclusion. These rates are broadly similar across ethnic groups⁴⁷ except for Asian pupils where the permanent exclusion rate for boys was 11 times that for girls (in the context of a low overall rate). For fixed period exclusions it was around 5 times higher.
- FSM pupils are three times more likely to receive an exclusion (fixed period or permanent) than non-FSM pupils. The increased rate is similar for both FSM boys and FSM girls. In line with boys' higher rate of exclusions, the rate for FSM boys is high: the proportion of fixed period exclusions is 18 percent for FSM boys compared to 7 percent for non-FSM boys. The comparable figures for girls are 6 percent (FSM girls) and two percent (non-FSM girls). Odds ratios confirm that the increased exclusion rates for boys (compared to girls) are similar across FSM category⁴⁸.

⁴⁷ Data are only available for "broad" ethnic groups: White, Black, Mixed, Asian.

⁴⁸ The odds ratio for receiving a fixed period exclusion for FSM boys was 3.7 (boys showing a greater likelihood) and for non-FSM boys the odds ratio was slightly higher at 4.

Figure 13-1 Percentage of Permanent Exclusions by Reason for Exclusion and Gender (2005)

	Percentage of permanent exclusions		
	Boys	Girls	Total
Physical assault against a pupil	15.6	3.4	19.0
Physical assault against an adult	11.1	2.3	13.5
Verbal abuse/threatening behaviour against a pupil	3.7	1.0	4.8
Verbal abuse/threatening behaviour against an adult	9.3	2.3	11.7
Bullying	0.9	0.5	1.4
Racism	0.3	0.1	0.4
Sexual misconduct	1.5	0.1	1.5
Drug and alcohol related	3.8	1.3	5.0
Damage	1.8	0.5	2.3
Theft	2.0	0.4	2.4
Persistent disruptive behaviour	23.7	7.0	30.7
Other	6.0	1.4	7.4
Total (Excludes non-maintained special schools)	79.8	20.2	100.0

Source: Termly Exclusions Survey 2004/05

Figure 13-2 Percentage of Fixed Period Exclusions by Reason for Exclusion and Gender (2005)

	Percentage of fixed period exclusions		
	Boys	Girls	Total
Physical assault against a pupil	16	4	21
Physical assault against an adult	4	1	5
Verbal abuse/threatening behaviour against a pupil	3	1	4
Verbal abuse/threatening behaviour against an adult	17	6	23
Bullying	1	1	2
Racism	1	0	1
Sexual misconduct	1	0	1
Drug and alcohol related	2	1	3
Damage	3	1	3
Theft	2	0	2
Persistent disruptive behaviour	20	7	27
Other	7	2	9
Total	76	24	100

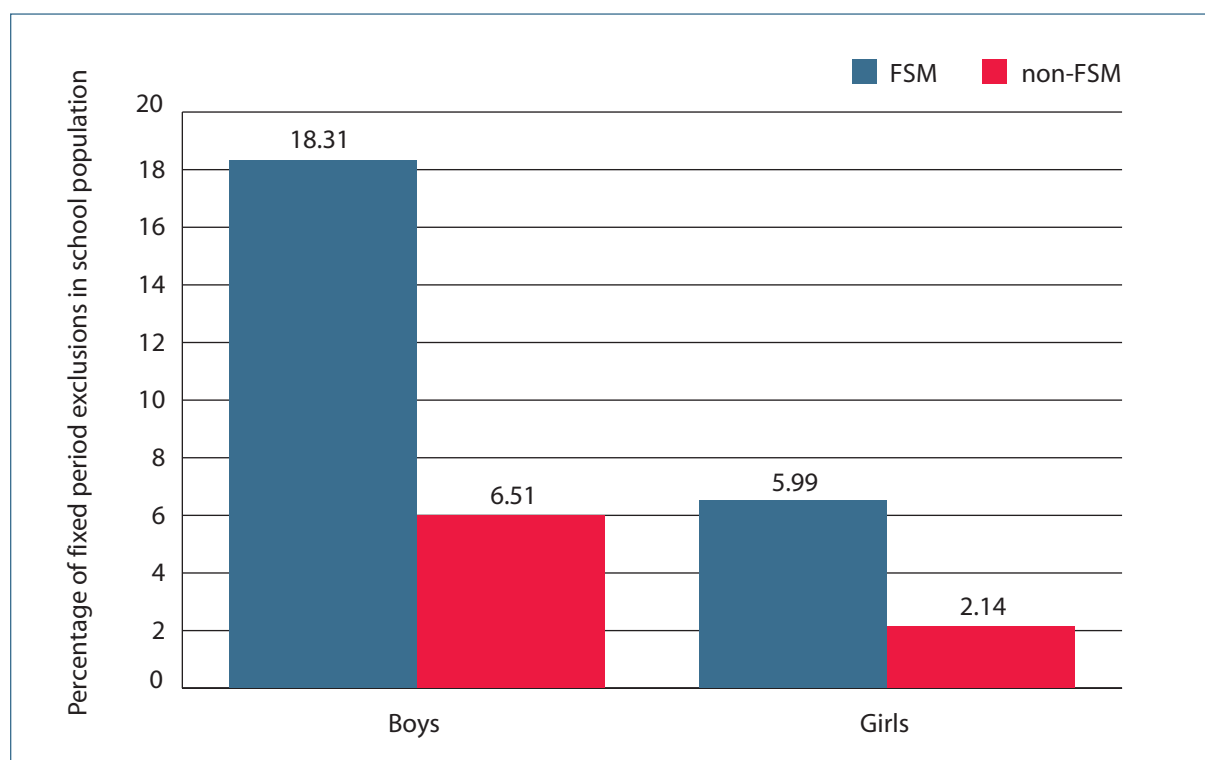
Source: Termly Exclusions Survey 2004/05

Figure 13-3 Percentage of Permanent and Fixed Period Exclusions by Ethnic Group and Gender (2005)

	White	Mixed	Asian	Black	Other	Total
Permanent Exclusions						
Boys	0.21	0.4	0.11	0.41	0.14	0.21
Girls	0.06	0.12	0.01	0.11	0.01	0.06
Rate (boys vs. girls)	3.5	3.3	11.0	3.7	14.0	3.5
Fixed Period Exclusions						
Boys	8.37	11.02	4.14	11.43	3.91	8.2
Girls	2.81	4.19	0.77	3.88	1.06	2.73
Rate (boys vs. girls)	3.0	2.6	5.4	2.9	3.7	3.0

*Note: Percentage of school population of same ethnic group and gender
Source: SFR 24/2006 Permanent and Fixed Period Exclusions from Schools and Exclusion Appeals in England 2004/05, issued June 2006*

Figure 13-4 Proportion of Fixed Period Exclusions by Gender and FSM status (2005)



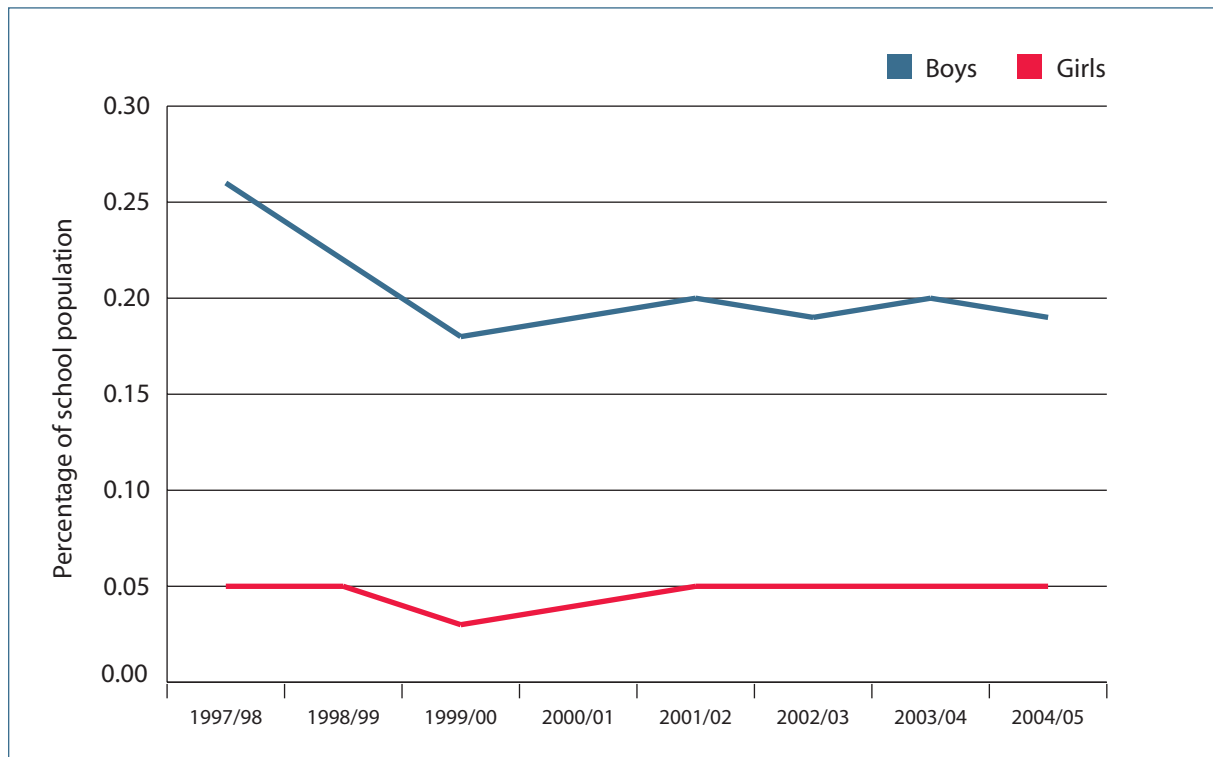
Source: DfES Termly Exclusions Survey

The focus on boys' higher exclusion rates should not lead us to ignore girls' exclusions. While the proportion of male exclusions in the school population has generally declined since 1998, there has been little change in the proportion of female exclusion (apart from a brief dip in 2000 and 2001) (see Figure 13-5). The most recent figures show that girls received 1,850 permanent exclusions (compared to 7,150 for boys) and 88,790 fixed period exclusions (compared to 276,700 for boys). Because of the decline in male exclusions, the proportion of female to male exclusions has increased. In 1998, girls accounted for 16 per cent of permanent exclusions; the most recent figures show that they now account for 21 per cent of

exclusions (2005) (see Figure 13-6)⁴⁹. FSM girls, like FSM boys, are three times as likely to receive a fixed period or permanent exclusion compared to their non-FSM counterparts.

In addition, researchers have drawn attention to self-exclusion and unofficial exclusions which are not picked up by official statistics and which will affect girls as well as boys. As behaviour problems are often construed as a male problem, it is argued that girls' difficulties become "invisible" and that girls' behavioural problems are not dealt with equally (Osler et al., 2002)⁵⁰.

Figure 13-5 Time Series Showing Percentage of School Population with a Permanent Exclusion by Gender (1998-2005)

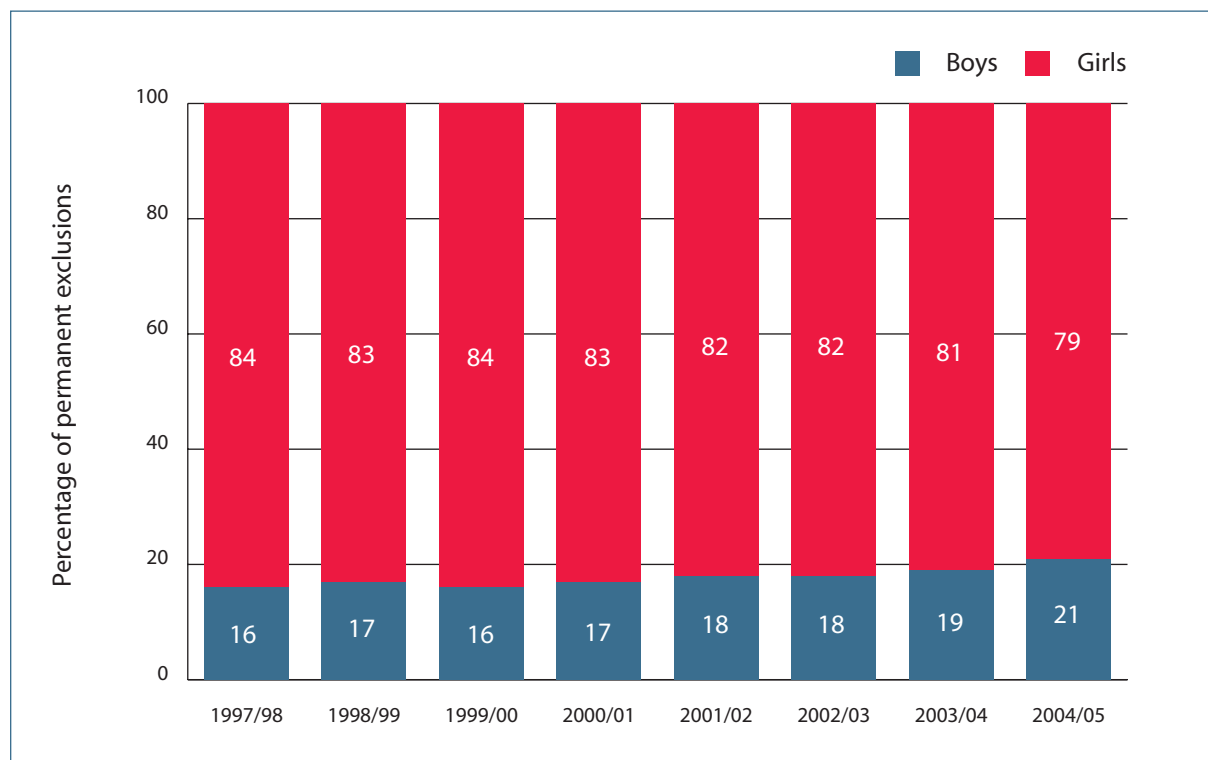


Source: SFR24/2006 *Permanent and Fixed Period Exclusions from Schools and Exclusion Appeals in England 2004/05*, issued June 2006

⁴⁹ Time series data on fixed period exclusions are not available.

⁵⁰ Osler, A., Street, C., Lall, M. & Vincent, K. (2002). *Not a problem? Girls and School Exclusion*. National Children's Bureau.

Figure 13-6 Time Series of Ratio of Boys to Girls with a Permanent Exclusion (1998-2005)



Source: SFR24/2006 Permanent and Fixed Period Exclusions from Schools and Exclusion Appeals in England 2004/05, issued June 2006

13.4 Attendance

Girls have slightly higher rates of authorised absence than boys but there are no gender differences in the rates of unauthorised absence (see Figure 13-7).

Figure 13-7 Percentage of School Absence by Gender (2005/06)

	% of half days missed: Authorised absence	% of half days missed: Unauthorised absence	% of half days missed: Overall absence
Girls	6.96	1.42	8.38
Boys	6.68	1.42	8.11
All pupils	6.82	1.42	8.24

Includes: Maintained Secondary Schools, City Technology Colleges and Academies

Source: SFR11/2007 Pupil Absence in Secondary Schools in England, 2005/06, issued March 2007

Data from the evaluation of the Excellence in Cities (EiC) programme⁵¹ recorded attendance rates at pupil level⁵², and is a large scale source of published attendance data with information on gender.

Authorised absence was higher amongst girls (27.6 half days) than boys (26.1 half days). Within the cohorts, these differences were statistically significant amongst boys and girls in Year 9 and Year 10, although not in Year 7 and Year 8.

⁵¹ Morris, M. & Rutt, S. (2005) *An Analysis of Pupil Attendance Data in Excellence in Cities (EiC) Areas and Non-EiC EAZs: Final Report*. DfES.

⁵² Data were available on 100,000 young people in over 400 EiC Secondary schools in 2002 and 2003. It was not a nationally representative sample as the EiC policy was targeted at deprived areas.

There was no significant difference in unauthorised absence between girls (5.05 half days) and boys (5.07 half days). However, within the cohorts, girls in Year 9 and girls in Year 10 had significantly higher unauthorised absence than boys in those year groups.

The reasons for girls' higher authorised absence are unclear and there are no data at present that record reason for absence. However, one common reason for absence, that a child has caring responsibilities, appears to affect girls more than boys⁵³ and this may be part of the explanation for the different pattern.

Attainment data from the EiC dataset also allows an analysis of the relationship between attendance and attainment: is there an association between poor attendance and poor attainment and is this association different for boys compared to girls?

Higher than average levels of absence (authorised and/or unauthorised) in EiC areas were associated with reduced attainment at Key Stage 3 and GCSE, with a particular impact on boys.

Girls whose mean attendance was the same as the mean for the cohort appeared to have a 48% probability of achieving five A* to C grades. Boys, in contrast, seemed to need an attendance that was some 20 half days (or two weeks) higher than the mean to have the same probability of achieving the same result at GCSE.

However, it is not known from these associations whether the increased likelihood of low levels of attainment with higher levels of absence are the direct result of poor attendance, whether poor prior attainment has led to poor attendance or whether some other factor, not included in the modelling process, is having a significant impact.

For example, in the case of boys, apparent underperformance by comparison with girls with the same level of attendance, prior attainment and other characteristics, one would need to question whether this means that boys need more time in school in order to achieve the same results as their female peers, or whether, perhaps, other factors (particularly attitudinal factors) are contributing to this difference in outcome. In the analyses conducted for the national evaluation of EiC, one of the key factors associated with higher levels of performance was a positive attitude to education: girls were significantly more likely than boys to be associated with such attitudes (but note that this has not been corroborated by findings we report from LSYPE).

13.5 Bullying

In the Families and Children Survey (FACS)⁵⁴ of over 7000 11 to 16 year olds and their parents, proportionately more girls than boys reported being bullied. Twenty nine percent of girls reported being bullied once or twice in the last year compared to 24 percent of boys.

Data from the Longitudinal Study of Young People⁵⁵ found that girls are more likely than boys to have been the victim of psychological bullying for example, being upset by name calling (37% compared to 23%) or excluded from a group of friends (19% compared to 5%). Boys are more likely than girls to have been the victim of physical bullying, for example, being threatened with violence (23% compared to 18%) or to have experienced violence from other students (24% compared to 12%). A similar proportion of boys (4%) and girls (3%) have been forced to hand over possessions.

⁵³ Social Care Institute for Excellence Research Briefing 11 (2005): *The Health and Well-Being of Carers*.

⁵⁴ Willitts, M., Anderson, T., Tait, C. & Williams, G. (2005). *Children in Britain: Findings from the 2003 Families and Children Survey (FACS)*, DWP RR249.

⁵⁵ Next Steps, Longitudinal Study of Young People (LSYPE), DfES, unpublished (2004 data).

13.6 Youth Offending⁵⁶

- Boys are more likely to have committed a criminal offence⁵⁷ than girls (33 percent compared to 21 percent).
- Boys are more likely than girls to have received any type of disposal and more than one in five (22%) have received a pre-court disposal (compared with 17% of girls). The proportion of girls receiving a pre-court disposal increased significantly more than boys between 2004 and 2005 (from 12% in 2004 to 17% in 2005, compared with an increase among boys from 20% to 22%).
- Boys are more likely to have been the victims of a physical assault. The proportion of boys who have been the victim of physical assault has increased steadily since 2003 (from 15%, 18% in 2004 and 22% in 2005). As with boys, there has been a steady increase in the number of girls who have been physically attacked (6% in 2003, 8% in 2004 and 10% in 2005) and also in those who have been threatened by others (21% in 2003, 23% in 2004 and 25% in 2005).

⁵⁶ Statistics are from the Youth Survey of 11-16 year olds of approximately 5000 young people. Phillips, A. & Chamberlain, V. (2006) *MORI Five-Year Report: An analysis of Youth Survey Data*, Youth Justice Board.

⁵⁷ A criminal offence could be handling stolen goods, stealing, causing criminal damage or carrying a weapon.

14 Why is There a Gender Gap?

14.1 Introduction

There are many theories of why boys and girls differ in their educational outcomes. These include: biological or brain differences; differences of maturation; differences in attitudes to learning and school; boys' strong peer identification which creates alienation from academic achievement; the structure and content of curriculum and assessment. This chapter reviews some of this evidence.

14.2 Key Findings

- Girls and boys tend to use different styles of learning and respond differently to the materials and tasks given to them. The PISA study found that girls are more likely than boys to control their learning (i.e. review what they have learned; review what they still need to learn) in all but four OECD countries.
- Boys' level of reading comprehension is significantly affected by the content of what is being read and their interest in it, while girls' performance shows relatively little influence by the content.
- Motivation also shows contrasting gender differences. According to PISA findings, in most countries, girls claim more effort and persistence and express significantly greater interest in reading. Boys show significantly more interest in Maths in most countries – by small degrees in some countries, but by much more in others.
- Girls and boys seem to relate differently to schooling and learning and girls find it easier to succeed in school settings.
- Type of school does not appear to influence the gender gap: across schools in England, there are hardly any where boys make greater progress than girls.
- However, there is some evidence to suggest that there are a large proportion of schools where boys and girls make similar progress but these tend to be schools where school performance is weak (i.e. for both boys and girls). The corollary of this is that the gender gap is wider in better performing schools.
- Boys are more likely to be influenced by their male peer group which might devalue schoolwork and so put them at odds with academic achievement.
- The introduction of the National Literacy and Numeracy Strategies had an impact on the gender gap by raising the attainment of boys (more than girls) in English, and girls (more than boys) in Maths. However, the gap persists.
- The use of coursework in examinations may advantage girls but analysis does not find that this alone accounts for the gender gap.

- Other aspects of the curriculum and assessment structure are implicated but there is little research examining how this works in detail. One piece of evidence, however, found that reading assessments which focus on narrative may accentuate the gender gap compared to more factual-based assessment. A study has shown that boys performed significantly better on a reading comprehension task involving factual content compared to one based on narrative content. Girls' reading comprehension scores were less influenced by the content of the task.

14.3 Are Gender Differences Attributable to Early Development?

The chapter on pre-school differences showed that gender differences are apparent from a young age. However, Machin and McNally (2005)⁵⁸ argue that if it were possible to address these early differences, it still would not eliminate the gap at age 16. They demonstrate this by examining whether the gender gap at 16 could be accounted for by prior attainment at age 11 (i.e. whether the gender gap at 16 is explained by what happens in secondary school or whether it pre-dates secondary school). They found that the gender gap was little changed after taking account of prior attainment at age 11 and so conclude that the early teenage years are vitally important in explaining the observed gender gap at 16.

14.4 Do Boys and Girls Have Different Learning Styles?

14.4.1 Differences in Reading Preferences

Girls and boys use different styles of learning and respond differently to the materials and tasks given to them (Sukhnandan et al., 2000⁵⁹). Boys are influenced by their reading experience and by their preference for non-fiction with diagrammatic and pictorial representations (Millard, 1997⁶⁰). Girls are more likely to read fiction and this experience of narrative structure better equips them for the extended and reflective writing that is highly valued in school assessment practices. Further, boys' level of interest in a particular topic appears to directly influence their level of understanding of that text i.e. interest and motivation boosts boys' engagement with – and subsequent understanding of – a text (Oakhill & Petrides (2007)⁶¹. Girls, on the other hand, although showing clear preferences for certain type of texts, can remain motivated in assessments, with no impact on their comprehension of that text.

14.4.2 Girls Respond to School Work More Positively

Girls and boys seem to relate differently to schooling and learning and girls find it easier to succeed in school settings (Sukhnandan et al., 2000). Girls place a high value on the presentation of their work; they spend more time trying to improve what they produce (McDonald et al.⁶², 1999) they care more about the opinion of their teachers (Bray et al., 1997⁶³), they derive more enjoyment from their school life (Arnot et al., 1998⁶⁴), in contrast to boys' attitudes.

⁵⁸ Machin, S. & McNally, S. (2005). Gender and Student Achievement in English Schools, Oxford Review of Economic Policy, 21 (3).

⁵⁹ Sukhnandan, L., Lee, B. & Kelleher, S. (2000). *An Investigation into Gender Differences in Achievement: Phase 2: School and Classroom Strategies*, Slough: NFER.

⁶⁰ Millard, E. (1997) *Differently Literate: Boys, Girls and the Schooling of Literacy*.

⁶¹ Oakhill, J. & Petrides, A. (2007). Sex Differences in the Effects of Interest on Boys' and Girls' Reading Comprehension. *British Journal of Psychology*, 98, 223-235.

⁶² MacDonald, A., Saunders, L. & Benefield, P. (1999). *Boys' Achievement, Progress, Motivation and Participation: Issues Raised by Recent Literature*. Slough: NFER.

⁶³ Bray, R., Gardner, C. & Parsons, N. (1997). *Can Boys Do Better?* Leicester: Secondary Heads Association.

⁶⁴ Arnot, M., Gray, J., James, M., Rudduck, J. & Duveen, G. (1998). *Recent Research on Gender and Educational Performance*, Ofsted.

14.4.3 Girls Do More Homework

Pupils who do regular homework have higher attainment. Findings from the Longitudinal Study of Young People⁶⁵ found a clear relationship between time spent doing homework and attainment at Key Stage 3. The findings do not tell us whether doing homework is the factor that contributes to attainment or whether doing homework is a proxy for motivation or general ability.

Nonetheless, it is interesting to note that girls tend to do more homework than boys. In the Families and Children Survey (FACS) of over 7000 11 to 16 year olds and their parents, seventy eight percent of parents reported that their daughters did all or almost all their homework compared to 61 percent of sons⁶⁶. There was no reported difference between boys and girls in the proportion who were given help with their homework.

14.4.4 International Evidence Demonstrates Consistent Gender Differences in Learning Style

PISA 2000⁶⁷ provided a great deal of information about gender differences in learning styles, collected through a questionnaire completed by students in 26 countries (including Scotland but not England) examining students' approaches to learning. The questionnaire examined aspects of students' motivation, self-belief and use of various learning strategies and found clear gender trends.

Figure 14-1 Gender Differences in Learner Characteristics (PISA 2000)

Characteristics	In how many of 21 OECD countries is there a significant male-female difference?	OECD average effect size
Female advantage		
Interest in reading	Female advantage in all countries but Korea	0.53
Self-concept in reading	Female advantage in 18 countries	0.29
Control strategies	Female advantage in 16 countries	0.18
Effort and persistence	Female advantage in 14 countries	0.16
Preference for co-operative learning	Female advantage in 11 countries; male in Korea	0.10
Memorisation strategies	Female advantage in 10 countries; male in Norway	0.10
Academic self-concept	Female advantage in Italy; male in Denmark	0.02
Male Advantage		
Elaboration strategies	Male advantage in 7 countries	0.06
Interest in mathematics	Male advantage in 14 countries	0.20
Preference for competitive learning	Male advantage in 16 countries	0.21
Self-efficacy (i.e. believes in own ability)	Male advantage in 18 countries	0.22
Mathematical self-concept	Male advantage in 17 countries	0.25

Source: Artelt et al. (2003). *Learners for Life: Student Approaches to Learning: Results from PISA 2000*, OECD

⁶⁵ Next Steps, Longitudinal Study of Young People (LSYPE), DfES, unpublished (2004 data).

⁶⁶ Lyon, N., Barnes, M. & Sweiry, D. (2006). *Families with Children in Britain: Findings from the 2004 Families and Children Survey (FACS)*, DWP RR339.

⁶⁷ Artelt, C., Baumert, J., Julius-McElvany, N. & Peschar, J. (2003). *Learners for Life: Student Approaches to Learning. Results from PISA 2000*, OECD.

The biggest single difference between male and female students was that the latter are more likely to be interested in reading. While the extent of gender differences varies considerably from country to country, the overall trends are summarised here:

- Some learning strategies are more commonly applied by females: most notably, they state they are more likely than males to control their learning (i.e. check what they have learned; review what they still need to learn) in all but four OECD countries. Yet when it comes to the other comprehension-oriented strategy, elaboration (i.e. how knowledge acquired in one context relates to new materials), the only cases where there are significant differences favour males, though in no case is the difference great. Thus while females are generally better at working out what they need to know, this advantage does not extend to information processing skills.
- Motivation shows contrasting gender differences. In most countries, girls express significantly greater reading interest and claim more effort and persistence. On the other hand, boys show significantly more interest in mathematics in most countries – by small degrees in some countries, but by much more in others.
- Students' self-related beliefs show similar patterns, with females generally confident in their verbal abilities and males in their mathematical abilities. A particular advantage for male students, their biggest strength outside the mathematics domain, is their confidence in being able to succeed in tasks, even where they find them difficult. Even though the extent of this advantage is modest, its incidence is widespread: it is identifiable at a statistically significant level in all but three OECD countries.
- Males and females have different learning preferences: in most countries males are more likely than females to be positive about competitive learning situations. In about half of countries, females are more likely than males to say that they like learning co-operatively; in the rest there is no difference, except in Korea where males favour co-operative learning more.

It is worth noting that such gender differences vary considerably from one country to another.

14.5 What is the Impact of Learning Style on Attainment Outcomes?

The previous section reported on overall gender differences in learning style, but do these differences have any differential impact on attainment? It is assumed that a successful learning style can have a positive effect on student performance. Students who can regulate their own learning in an effective manner are assumed to set realistic goals, to select learning strategies and techniques appropriate to the demands of the task at hand, to shield themselves from competing intentions and to maintain motivation when learning (Artelt et al., 2003).

Data from PISA describes a relationship between style and learning outcome with a high degree of consistency within each country in the association between positive learning approaches and strong performance. Here, students' attitudes – their self-confidence and level of motivation – play a particularly important role alongside effective learning behaviour: the adoption of strong learning strategies. Strong attitudes are shown to be important for performance both in making it more likely that students will adopt fruitful strategies and in their own right independently of whether these strategies are actually adopted.

Students' approaches to learning impact on performance over and above the effect of family background. This is most obvious for motivational variables such as interest in reading and is also evident for students' beliefs in their own efficacy in some countries. Additionally, the data show that a large amount of the variability in performance associated with student background is also associated with the fact that students from more advantaged backgrounds tend to have stronger characteristics as learners.

However, only a fraction of the differences in student performance (about a fifth) are related to the variations in approaches to learning measured in PISA. The abilities being assessed depend also on a range of other factors including prior knowledge, capacity of the working memory and reasoning ability.

Two important findings on the association between learning style and outcome were reported relating to gender:

- Of the learning strategies assessed, controlling one's learning has the closest relationship with performance and is used more by female than male students.
- Elaboration strategies are also related to performance, but tend (in countries where there are differences) to be used more by male students. This male tendency to process information and female tendency to think about what is being learned and relate it more to their goals shows that different learners have different strengths.

14.6 Does Type of School Make a Difference?

The gender gap appears to be fairly pervasive across schools. Burgess et al. (2004)⁶⁸ and Gray et al. (2004)⁶⁹ both found only very small proportions of schools where boys were making better progress than girls between Key Stage 3 and Key Stage 4 (the studies both used multi-level modelling of over 2500 schools from the National Pupil Database, 2001). However, Gray et al. identified a sizeable proportion of schools where boys and girls were making similar progress. This proportion is dependent on the criteria for measuring the difference between boys and girls, hence a more stringent (and conventional) criteria found that, in 48 percent of schools, boys and girls were making roughly similar progress, and according to a less stringent criteria, only 21 percent of schools were doing equally well for both sexes.

Further, Gray et al. (2004) found that these patterns were related to the overall standards of a particular school. Schools were ranked as performing above, around or below expectations. There were proportionately more schools ranked as performing below expectations that had no gender gap than those that had a gender gap (according to the stringent criteria). Gray et al. argued that the schools where boys and girls were making equal progress were often schools where overall performance was weak i.e. the performance of both boys and girls was perceived to be a problem.

This is in contrast to Burgess et al.'s (2004) conclusions. They argued that the gender gap cannot be explained sufficiently by any of the school factors they examined. They found that the gender gap was not affected by whether a school was a good or poor performer, or was an "effective" or "ineffective" school in terms of the progress its pupils made. In addition, gender differences were not explained by a school's gender mix, its admissions policy, religious denomination, size or its social mix (in terms of proportion of pupils with FSM).

⁶⁸ Burgess, S., McConnell, B., Propper, C. & Wilson, D. (2003). *Girls Rock, Boys Roll: An Analysis of the Age 14-16 Gender Gap in English Schools*, CMPO Discussion Paper No. 03/084.

⁶⁹ Gray, J., Peng, W., Steward, S. & Thomas, S. (2004). *Towards a Gender-Related Typology of School Effects: Some New Perspectives on a Familiar Problem*, *Oxford Review of Education*, 30, 4, 529-550.

The researchers conclude that gender differences cannot be accounted for by within-school policy or practice.

These contrasting conclusions based on the same complex dataset suggest that further research is still needed to understand how the gender gap varies across schools. Gray et al. also acknowledge that the nature, as well as the extent, of the gender problem is influenced by the type of statistical assumptions applied. Nonetheless, both studies show that there are very few schools where boys make better progress than girls, and for the majority of schools, girls make greater progress between Key Stage 3 and Key Stage 4.

14.7 How Does Teacher-Pupil Interaction Impact on the Gender Gap?

A number of studies have identified the different ways teachers interact with boys and girls. Howe (1997⁷⁰) found that such differences in interactions emerge very early, even in pre-school. Boys make more contributions during classroom interactions and so receive a greater share of the teacher's time. Additionally, their contributions are more likely to be evaluated – both positively and negatively – by teachers and peers during the classroom interaction. Girls request help from others to a greater extent than boys and they compensate for the reduced time they have with teachers by approaching teachers individually, to ensure that their questions are answered. Arnot et al. describe a male public learning strategy compared to a female private learning strategy.

However, there is no evidence that these different teacher-pupil interactions result directly in differential educational achievement.

14.8 Aspects of Masculine Identity Can Be Seen as Incompatible with Academic Success

Boys are more likely to be influenced by their male peer group which might devalue schoolwork and so put them at odds with academic achievement. It is argued that girls do not experience a conflict of loyalties between friends and school to the same extent as boys (Forde et al., 2006⁷¹).

Forde et al (2006) summarise theories of how boys try to maintain their sense of masculinity in a school setting. Boys feel compelled to conform to a dominant view of masculinity which conceptualises academic work as feminine and therefore being seen to work in school can be seen as a problem. In conflict with this identity, is the culture of school where academic achievement is the main criterion for judging the 'worth' of a pupil. In order to protect their self-worth and their masculinity, boys will commonly adopt four strategies: procrastination; withdrawal of effort and rejection of academic work; avoidance of the appearance of work; and disruptive behaviour.

According to this view, disruptive behaviour will have a number of benefits (Jackson 2002 cited in Forde et al., 2006): it will increase a boy's status with his peer group; it can deflect attention away from academic performance and on to behaviour; any failure to achieve can be attributed to poor behaviour rather than to lack of ability; and it can sabotage the academic efforts of other boys.

⁷⁰ Cited in Arnot, M., Gray, J., James, M., Rudduck, J. & Duveen, G. (1998). *Recent Research on Gender and Educational Performance*, Ofsted.

⁷¹ Forde, C., Kane, J., Condie, R., McPhee, A. & Head, G. (2006). *Strategies to Address Gender Inequalities in Scottish Schools: A Review of the Literature*, Scottish Executive Social Research.

14.9 Do Parents Have Different Educational Expectations of Their Sons Compared to their Daughters?

There is some evidence that parents' educational expectations differ for sons vs. daughters. However, there is no evidence that such expectations result in differing achievement. For example, in the Families and Children Survey (FACS)⁷² of over 7000 11 to 16 year olds and their parents, differences were found between parents' aspirations for girls and boys; 72 percent of boys' parents wanted them to stay on at school compared to 87 percent of girls' parents. Conversely parents were more likely to want sons to go on a training course or apprenticeship: 19 percent of boys vs. 8 percent of girls. Parents of girls were also more likely than parents of boys to hope their child would attend university (60 and 49 percent, respectively). These differences are also reflected in the child's aspirations with 22 percent of boys saying they would like a full time job at 16 compared to only 15 percent of girls; 22 percent of boys saying they would like to study full time, compared to 27 percent of girls. These data do not show causality i.e. there is no evidence here that parents' differing expectations play a causal role in the differential attainment of boys and girls.

14.10 How Does Social Class and Other Aspects of Pupil Identity Interact with Gender?

Section 14.8 describes a view of masculinity and how it might clash with the school culture to create specific responses to school work and disruptive behaviour. However, Forde et al (2006) caution that individuals will have intersecting identities: gender identities are likely to interact with other aspects of social identity, including class, culture, ethnicity and sexuality. While the data presented in Chapter 6 did not find a large interaction effect of FSM by gender, attitudes towards school are likely to be a complex result of responses to class, gender and ethnicity. For example, for White working class boys, academic achievement might be perceived not only as conflicting with their masculine identity but also be seen as an act of disloyalty to their wider community.

Mac an Ghail (1988)⁷³ describes how Black boys and girls might respond differently to institutional racism. Black girls will comply with formal rules but will withhold any real engagement with the organisation while Black boys will challenge the school culture more directly and will therefore be more likely to be excluded.

14.11 Does Teaching Practice Affect the Gender Gap?

Machin and McNally (2005)⁷⁴ examined the effect of the National Literacy Project (NLP) and the National Numeracy Project (NNP) on the relative attainment of boys and girls⁷⁵ and found that the new teaching methods introduced in 1997 did appear to have an effect on the gender gap, by raising the attainment of boys in English, and girls in Maths.

⁷² Lyon, N., Barnes, M. & Sweiry, D. (2006). *Families with Children in Britain: Findings from the 2004 Families and Children Survey (FACS)*, DWP RR339.

⁷³ Cited in Forde, C., Kane, J., Condie, R., McPhee, A. & Head, G. (2006). *Strategies to Address Gender Inequalities in Scottish Schools: A Review of the Literature*, Scottish Executive Social Research.

⁷⁴ Machin, S. & McNally, S. (2005). Gender and Student Achievement in English Schools, *Oxford Review of Economic Policy*, 21 (3).

⁷⁵ They compared attainment in English and Maths in 400 primary schools which implemented the Projects before the national roll-out relative to similar schools where they had not yet been introduced.

While both strategies were effective for both boys and girls, the magnitude of the impact was greater for the gender that was generally weaker in a particular subject. For English, the 'literacy hour' had a greater relative impact on boys (raising the required standard by 4.2 percentage points compared to 2.1 percentage points for girls) while the 'numeracy hour' had a greater relative impact on girls (3.8 percentage points for girls compared to 2.5 percentage points for boys).

The strategies were introduced primarily to raise standards (rather than close the gender gap). These findings indicate that, using a highly structured approach to teaching, standards did improve and improvement was greatest for the weaker students i.e. greater for boys in English and girls in Maths – therefore teaching practice is a factor in differential attainment between the sexes. However, the persistent gender gap shows that such changes in teaching approaches have not been sufficient to close the gap. Moreover, it is likely to be the case that teaching practice can raise standards for higher achieving pupils, which would perpetuate achievement gaps.

14.12 Are Changes in the Examination System Responsible for the Gender Gap?

The onset of a gender gap in 1988 (as illustrated in Figure 3-7 of 5 or more O-Levels/GCSEs), the year when GCSEs were introduced, points to the change in the examination system as a major reason for this gap. Although this masks significant differences between subjects, the gender gap has increased in some subjects, notably, in English where the average gap has widened from an average 9 percentage point gap in the 1980s to a 16 percentage point gap in the 1990s.

14.12.1 Coursework

GCSEs include a large proportion of coursework or continuous assessment and it has been argued that this change might be responsible for girls' advantage in many GCSE subjects. Powney (1996⁷⁶) reported that boys do better with multiple choice questions and girls with essays and coursework. One explanation for this could be that girls do less well in timed examinations due to higher levels of anxiety (Gipps & Murphy, 1994⁷⁷) and that girls have better concentration over a longer period of time, giving them an advantage for coursework. Stobart et al. (1992)⁷⁸ found a direct relationship between the relative improvement of girls' achievement and the weighting and type of coursework required in different subjects (the researchers compared the gender gap for GCSE subjects with varying amounts of coursework with the same O-Level subjects where there was no coursework).

However, Elwood argues strongly (2005⁷⁹) that it is unlikely that coursework is the only reason for the gender gap. By using a 'weights' analysis, she challenges the notion that coursework is the key component by showing that coursework has less influence than the examination component on the final grade. She found that coursework has less influence on girls' results than on boys', but, as coursework has more influence on boys' results, she does acknowledge that this could be part of the reason that boys are less successful, but that it cannot be the sole factor.

⁷⁶ Powney, J. (1996). *Gender and Attainment – a review*. Edinburgh: Scottish Council for Research in Education.

⁷⁷ Gipps, C. & Murphy, R. (1994). *A Fair Test? Assessment, Achievement and Equity*. Buckingham: Open University Press.

⁷⁸ Stobart, G., Elwood, J. & Quinlan, M. (1992). Gender Bias in Examinations: How Equal Are the Opportunities? *British Educational Research Journal*, 18(3).

⁷⁹ Elwood, J. (2005). Gender and achievement: What Have Exams Got to Do With It? *Oxford Review of Education*, 31 (3), 373-393.

As there have been past changes to the proportion of GCSE coursework, it is possible to examine whether such changes affected the gender gap (Elwood, 1995⁸⁰; QCA 2006⁸¹). For example, as reported by QCA, in GCSE English, by the early 1990s, for about two-thirds of students English was assessed by 100% coursework. Changes were subsequently made that reduced the coursework component to 40%. The first results for the new specifications were issued in 1994. If the hypothesis that coursework advantages girls is true, one would expect the gender gap to have narrowed as a result of these changes. On the contrary, the gender gap increased from 16 to 17 percentage points (in girls' favour). In the 2000s, the gap has been between 15-16 percentage points, showing the reduction of the coursework component can have had very little impact on the gap.

GCSE maths has also varied in its ratio of coursework to examinations. For the first three years of GCSE maths exams, coursework was optional and large numbers of centres did not choose it. From 1991 to 1993, it was a compulsory element weighted at a minimum of 20% and from 1994 it became optional again. The QCA report says that there is no reflection of these changes in the pass rate between 1990 and 1991 or between 1993 and 1994. However, the gender gap did reduce between 1991 and 1993 (boys were 4 percentage points ahead in 1991 and only 1 percentage point ahead in 1993). While this seems to reflect a longer term trend beginning in 1986, it is still open to debate whether coursework has helped girls close the gap in Maths.

The evidence on coursework suggests that it may give girls' some advantage. Nonetheless, it can't account for the gender gap in its entirety. Perceptions of girls' perceived advantage in coursework is high amongst teachers. Over half (53%) of teachers felt that there was a difference between boys' and girls' ability to do coursework (Bishop et al, 1996⁸²).

14.12.2 Item Content

Researchers have found differences in boys' and girls' responses to particular types of written tasks. Girls are likely to perform better than boys on tasks which involve open-ended writing, particularly when this involves personal response. The gap narrows if the responses are fixed-choice or short-answer (Gipps and Murphy, 1994⁸³). Even within multiple-choice tests, traditionally seen as favouring boys, there are differential response patterns. Carlton (2000⁸⁴) has shown that in such tests females perform better than males, matched for ability, on questions in which the content is a narrative or is in a humanities field and when the content deals with human relationships. As the context of an item grows larger the relative performance of females also improves.

A recent study by Oakhill and Petrides (2007)⁸⁵ found that boys' level of reading comprehension is significantly affected by the content of what is being read and their interest in it, while girls' performance shows relatively little influence by the content. Oakhill and Petrides explored the finding that boys' scores in reading comprehension appeared to increase by 14 percent between 1998 and 1999 on national curriculum assessments: the 1998 paper was an extract from a novel about children evacuated during the second world war

⁸⁰ Elwood, J. (1995). Undermining Gender Stereotypes: Examination and Coursework Performance in the UK at 16, *Assessment in Education*, 2(3), 283-303.

⁸¹ *A Review of GCSE Coursework*, Qualifications and Curriculum Authority, 2006.

⁸² Cited in Arnot, M., Gray, J., James, M., Rudduck, J. & Duveen, G. (1998). *Recent Research on Gender and Educational Performance*, Ofsted.

⁸³ Cited by Gipps, C. & Stobart, G. (2004). Fairness in Assessment in *Perspectives on Pupil Assessment*, General Teaching Council Conference.

⁸⁴ Cited by Gipps, C. & Stobart, G. (2004). Fairness in Assessment in *Perspectives on Pupil Assessment*, General Teaching Council Conference.

⁸⁵ Oakhill, J. & Petrides, A. (2007). Sex Differences in the Effects of Interest on Boys' and Girls' Reading Comprehension. *British Journal of Psychology*, 98, 223-235.

while the 1999 paper was about spiders. The researchers readministered these tests to a new group of children and found that boys showed a clear preference for the spiders assessment and girls to the evacuation assessment. The girls' performance was not related to their expressed preference (they performed similarly on both assessments), while it was related for the boys who performed significantly better on the spiders assessment. Nonetheless, girls did better than boys on both assessments (the gender gap being narrower for the spiders assessment). The researchers hypothesise that, because girls generally engage in more out-of-school reading than boys, they may have developed an interest in a wider range of genres and topics which makes them less influenced by their preference for a particular type of topic or text compared to boys.

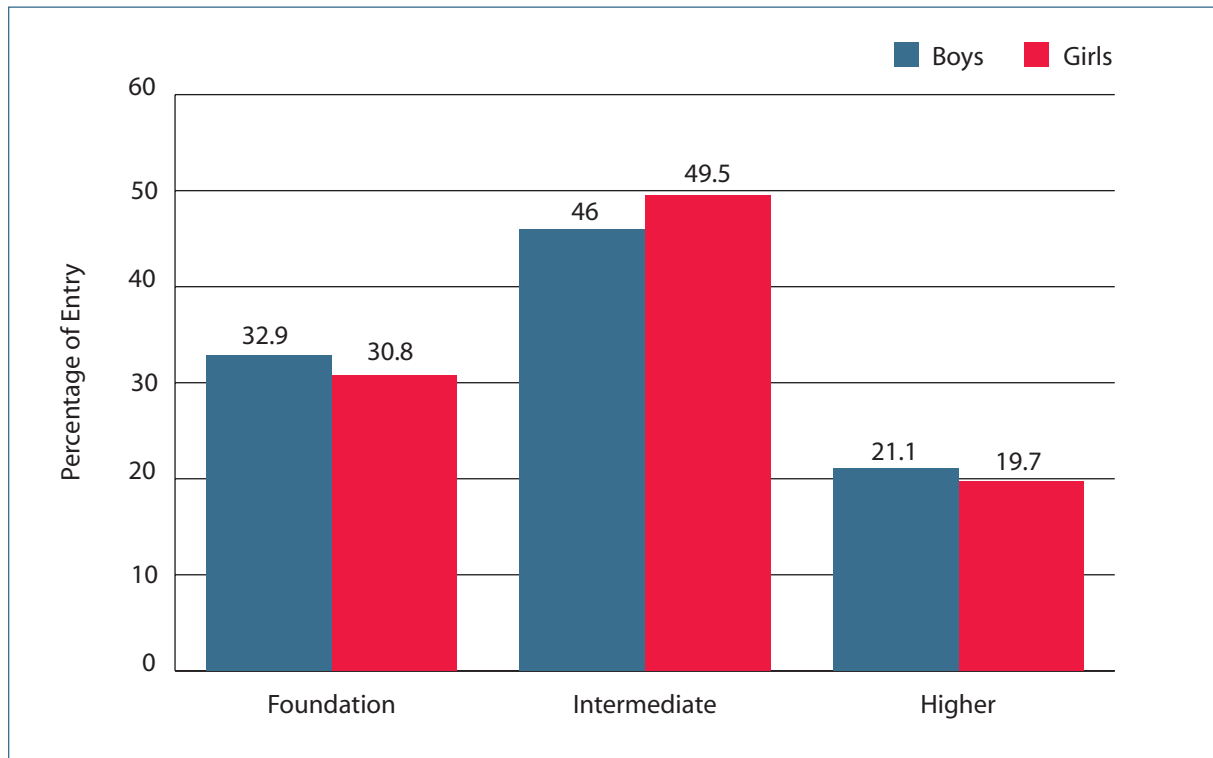
The implication of this research is that the size of the gender gap on reading comprehension tasks can vary depending on the content of the assessment. If the test includes elements that, in general, interest boys, the gender gap would be narrower.

14.12.3 What Role Does a Tiered Entry Scheme Have?

Elwood (2005) has found that girls and boys are differentially entered for different tiers in Maths (this may be a reflection of prior attainment but may also be influenced by teachers' expectations). She also argues that the tiered entry scheme can have a significant effect on the gender gap.

A teacher will decide which tier of a subject a pupil should be entered for, which has implications for the possible range of marks a pupil can achieve. The teacher will make this decision based on prior attainment but it is recognised that such decisions are "*a value-laden activity*" (Elwood, 2005⁸⁶). Figure 14-2 shows that proportionately more boys than girls are entered for the Foundation (lower) tier in Maths (with a maximum grade D), more girls for the Intermediate tier, and more boys for the Higher tier.

⁸⁶ Elwood, J. (2005). Gender and Achievement: What Have Exams Got to Do With It? *Oxford Review of Education*, 31 (3), 373-393.

Figure 14-2 Entry by Tier and Gender for GCSE Maths (2000)

Source: Elwood (2005)

Being entered for the Foundation tier is argued to have a different impact on boys than girls (Stobart et al., 1992):

- Low ability girls are generally better motivated than low ability boys.
- Boys tend to feel that the lower tier is not worth it. Girls are often more content to take a lower tier.

Stobart et al. have also argued that the larger female entry in the intermediate tier represents an underestimation of girls' mathematical abilities by teachers who perceive girls to be less confident and more anxious of failure in maths than boys and more adversely affected by final examinations. The intermediate tier offers grade C while avoiding the risk of being unclassified if performance drops below this grade on the higher tier. Elwood (2005) found that, for GCSE Maths (2003 results), girls achieved 2% more A*–C grades than boys in GCSE maths; however tiering arrangements indicate that more of girls' top grades came from the intermediate tier.

15 Strategies for Raising the Attainment of Boys

15.1 Introduction

This chapter examines strategies that have been identified in the research literature that are seen as effective in raising the achievement of boys. It draws heavily on the research of Younger and Warrington (2005)⁸⁷ who conducted a four year study examining how to raise boys' achievement, working with over fifty primary, secondary and special schools. They identified four approaches to raising achievement: pedagogic, individual, organisational and socio-cultural and this chapter is structured using these four themes. The chapter concludes with a discussion of the effectiveness of role models.

An important point raised by Younger and Warrington is that strategies to raise boys' achievement, if successful, are also likely to raise girls' achievement, and thus perpetuate the gender gap. They argued that any strategy to raise boys' achievement should not be done in a way that could be detrimental to girls' social or academic progress.

15.2 Key Findings

- Combating images of laddish masculinity and establishing a strong school ethos are seen as central to raising boys' attainment. In order for specific strategies to be successful, pupils with this sort of self-image need to be offered support and their achievements valued.
- Strategies to raise boys' achievement, if successful, are also likely to raise girls' achievement, and thus perpetuate the gender gap. It has been argued that any strategy to raise boys' achievement should not be done in a way that could be detrimental to girls' social or academic progress.
- There is not a case for boy-friendly pedagogies – pedagogies which appeal to and engage boys are equally girl-friendly.

⁸⁷ Younger, M., Warrington, M. with Gray, J., Rudduck, J., McLellan, R., Bearne, E., Kershner, R. & Bricheno, P. (2005). *Raising Boys' Achievement*, RR. 636, Department for Education and Skills.

15.3 Pedagogic Approaches

Younger et al. examined pedagogic approaches that focused on raising standards of literacy in primary schools, an area traditionally associated with boys' achieving less well. They identified the following successful strategies:

- A variety of interactive classroom activities are adopted, with a 'fitness for purpose', so that both short, specific focused activities and more sustained, ongoing activities are used, as and when appropriate.
- Acknowledgement is given to the central importance of talk, to speaking and listening as a means of supporting writing.
- Teachers are prepared to take risks to bring more creativity and variety to literacy.
- More integrated use is made of ICT so that high quality presentation of work can be more easily achieved, and drafts amended more easily.

Schools also worked on learning and teaching styles. The researchers found little evidence that boys and girls had different learning styles from each other but they did find that it was helpful to discuss different learning styles (without simply encouraging a preferred learning style) for example:

- By giving presentations to teachers and students about different modes and styles of learning.
- By teaching students that, as individuals, they have different learning styles, some of which (e.g. visual, auditory or kinaesthetic) may be more prominent than others, but that to be effective learners, they must be able to access different learning styles at different times.
- By encouraging teachers to plan lessons which encompass different learning styles, and thus become more creative in their teaching, planning and assessing.

15.4 Individual Approaches

Target-setting and mentoring were two useful strategies to promote change at an individual level. Effectiveness was based on these pre-conditions being met:

- Target-setting should be both realistic and challenging, not simply based on historic data within the school, but based upon higher expectations and detailed analysis of contextualized value-added data at the individual level.
- Teachers within subject departments need time and support on a regular and frequent basis, to set targets for individuals within their classes, and to engage in professional dialogue about learning at the level of the individual child.
- Mentoring needs to be developed within an ethos which accepts that mentors will mediate and negotiate with subject teachers on behalf of 'their' student, and subsequently challenge 'their' student to achieve more.
- The mentor needs to be credible to individuals, collaborative in approach and supportive. The mentor should offer strategies, advice and encouragement, but crucially, also be assertive and demanding, so that disengaged students have the opportunity to protect their own image and use their mentor's pressure to excuse their own involvement in academic work.

15.5 Socio-Cultural Approaches

Younger et al. (2005) see it as important to address the issue of some boys' disruptive behaviour which appears to be a result of protecting their macho image. These boys are frequently key players in affecting the tone and engagement of the whole year group, and they sometimes hold considerable sway amongst their peer group.

They describe some initiatives that were seen to be effective:

- Citizenship initiatives in primary schools, linked to Schools Councils, teambuilding clubs, circle time and a 'You Can Do It' programme.
- A central focus on the Arts across primary schools, with artists-in-residence schemes, poetry weeks, dance sessions run by professional dancers, and drama productions which allocated lead roles to disengaged boys.
- Paired reading schemes between year 3 and year 5 pupils, with the explicit rationale of promoting self-esteem amongst the year 5 'experts'.
- A key leader and key befriender scheme in secondary schools, targeting and supporting particularly those students (usually more boys than girls) whose physical presence, manner and behaviour exerted considerable power and influence within the peer group.

For the key leader / key befriender scheme in secondary schools to be effective, the following pre-conditions were needed:

- It has been possible to identify accurately the key leaders in the year group, who will also respond positively to initiatives the school puts in place.
- Key bendifenders are willing to work with disengaged and challenging individual students, and who are credible, able to establish rapport, use persuasion and model non-stereotyping attitudes and behaviour.
- The school has been able to mould expectations and change aspirations, through the creation of a school 'house' style, with emphasis on uniform, on regular attendance and responsive behaviour monitoring, and on the school day as a time of learning rather than social activity.

In the primary contexts, the following pre-conditions were necessary:

- Head teachers acknowledged under-achievement and used familiar curricular activities creatively and imaginatively to target it.
- Teachers were willing to take risks to engage individual pupils in roles where they were actively supported to make choices and to achieve success.
- Staff were fully committed to create opportunities to give pupils space to articulate their feelings and emotions.
- Pupils were challenged but there were also activities in which, individually, they could excel.

15.6 Whole School Organisational Approaches – Single Sex Classrooms

The evidence on the benefits of single sex classrooms is inconsistent and inconclusive, especially in showing any impact on attainment. Single sex classrooms have often been introduced for a number of different reasons and so it is difficult to reach an overall conclusion on their merits.

15.6.1 Purposes of Single Sex Teaching

Warrington and Younger (2004⁸⁸) described the reasons why single sex teaching can be adopted:

- To encourage able girls to become more involved in lessons and to boost confidence in scientific abilities (i.e. an equal opportunities strategy).
- To encourage boys to work more collaboratively and to develop the social skills necessary for working in mixed groups in subsequent years.
- To address the underachievement of boys, and specifically in some schools, the gender gap in English and/or modern languages.
- To limit the effect of boys' bad behaviour and lessen boys' need to be 'laddish'.

15.6.2 Measuring Impact

As a result of the diverse reasons for implementing this strategy, researchers have measured a number of outcomes. In addition, as the strategies have often been measured after only a short implementation period, it is difficult to measure impact especially in terms of improvements in attainment. Often it is teachers' and pupils' perceptions that are measured.

15.6.3 Pupils' Responses to Single Sex Grouping

The evidence on pupils' responses to single sex grouping is mixed. Younger et al. (2005)⁸⁹ found that boys and girls may feel more at ease in single sex classes, feel more able to interact with learning and feel free to show interest in the lesson without inhibition. It was felt that there can be positive effects on achievement for boys in modern languages and girls in science and maths.

However, Sukhanandan et al. (2000)⁹⁰ (who conducted 8 case studies) found that boys and girls responded differently. Boys (and teachers) felt that the use of fast paced, highly structured lessons with short-term tasks made lessons more enjoyable and interesting. In addition, boys' levels of distraction were reduced and there was greater self-confidence in lessons. Male role models helped to challenge boys' stereotypical perception of the 'feminine' nature of language subjects. Girls, on the other hand, accrued less benefit from the arrangements, and this may reflect the observation in other research in this area, that boys' single sex lessons are adapted and tailored more than girls' single sex lessons. Indeed, Younger et al. (2005) argued that the issue of effective teaching styles for boys were "*simply discussion about the essence of high quality teaching*" (p.86) and that there is no "*evidence... that such strategies support the learning of boys more than girls... we do not accept the claim that girls' classes require a less active, less structured, less interactive, less varied pedagogy than boys' classes*" (p.86).

15.6.4 Confounding Effects

Smithers and Robinson (2006)⁹¹ develop this point. Attempting to deal with the underachievement of boys by focusing and tailoring teaching methods may be a question of what makes a well-taught lesson rather than an issue of separating the sexes. They argue that these sorts of studies are vulnerable to a 'Hawthorne Effect', which is a kind of placebo effect:

⁸⁸ Cited in Forde, C., Kane, J., Condie, R., McPhee, A. & Head, G. (2006). *Strategies to Address Gender Inequalities in Scottish Schools: A Review of the Literature*, Scottish Executive Social Research.

⁸⁹ Younger, M., Warrington, M. with Gray, J., Rudduck, J., McLellan, R., Bearne, E., Kershner, R. & Bricheno, P. (2005). *Raising Boys' Achievement*, RR. 636, Department for Education and Skills.

⁹⁰ Sukhnandan, L., Lee, B. & Kelleher, S. (2000). *An Investigation into Gender Differences in Achievement: Phase 2: School and Classroom Strategies*, Slough: NFER.

⁹¹ Smithers, A. & Robinson, P. (2006). *The Paradox of Single-Sex and Co-Educational Schooling*, University of Birmingham: Carmichael Press.

doing something different in a school (which involves focusing on pedagogy) creates more positive responses than maintaining the status quo. Teachers involved in these studies may be enthused. Indeed, often experienced and effective teachers are often appointed to boys' only classes, suggesting that, as Younger et al. argue, the perceived benefits are more about the quality of teaching and the teacher than to do with the single sex environment.

15.6.5 Disadvantages of Single Sex Teaching

Researchers have also noted some disadvantages of single sex teaching. Sukhnandan et al. (2000) argue that tailoring lessons to the different learning styles of boys and girls can be problematic:

"... 'matching' the learning styles of boys and girls can be perceived as an approach that simply reinforces the different learning styles of boys and girls by exploiting the areas where they are strong and by ignoring their areas of weakness. Although this may lead to increased pupil achievement in terms of examination performance, it may have detrimental effects on pupil achievement at a broader level." (p.28).

Additionally, Younger et al. (2005) found that some boys-only classes became challenging to teach, with boys' behaviour worsening and laddish behaviour increasing:

"...in some schools, boys-only classes have become very challenging to teach, or stereotyping of expectation has established a macho regime which has alienated some boys." (p.7).

15.6.6 Summary on Single Sex Teaching

There are some perceived advantages to teaching boys and girls separately, but the evidence is mixed and the impact on attainment is not known. Riordan (2002 cited by Smithers and Robinson, 2006) argued that the academic culture and ethos of the school is the key to success and that it is doubtful whether single sex classes within a co-educational school could be expected to have a major impact, especially as mixing or separating the sexes in schools does not appear to have any consistent effects.

15.7 Role Models

The increasing gender imbalance in the school workforce (see Chapter 17 which shows the continuing decline in the proportion of male to female teachers in both primary and secondary school) has raised concern that male role models are not available to boys. The fact that policy efforts have been made to address this imbalance (e.g. the Teacher Training Agency requested its providers to set recruitment targets of men onto teaching training courses, TTA 2002) reflects the theory that having more male teachers could help to raise the attainment (and/or improve the behaviour) of boys.

However, this approach has been criticised as simplistic. Interviewing over 300 pupils aged 7-8, Francis et al (2006)⁹² found that 65 percent of pupils and a similar proportion of teachers rejected the idea that the gender of the teacher mattered (for the pupil responses, an equal proportion of boys and girls thought this). Together with Ashley (2002⁹³), they found that children looked to the qualities and ability of a teacher, rather than their gender. Moreover, there is very little evidence to date as to whether a teacher's gender does or does not play a

⁹² Francis, B., Skelton, C., Carrington, B., Hutchings, M., Read, B. & Hall, I. (in press). A Perfect Match? Pupils' and Teachers' Views of the Impact of Matching Educators and Learners By Gender. *Research Papers in Education Journal*.

⁹³ Cited in Forde, C., Kane, J., Condie, R., McPhee, A. & Head, G. (2006). *Strategies to address gender inequalities in Scottish schools: A review of the literature*. Scottish Executive Social Research.

significant role in their pupils' attainment (mainly because it is very hard to measure a causal relationship between a teacher's gender and a pupils' attainment, in the context of so many other competing variables).

Qualitative research by Myhill and Jones (2006)⁹⁴ found that pupils often perceived female teachers as being less influenced by gender expectations than male teachers. First, they found that both boys and girls felt that teachers treated boys more harshly than girls. This finding is in line with other research suggesting that teachers have low expectations of boys' academic potential and such low expectations could contribute to their low achievement. Interestingly, Myhill and Jones found that the older children interviewed (Year 8 up to Year 10) expressed the view that the gender of the teacher influenced the way teachers treated boys and girls. Male teachers were seen as treating boys more harshly, while female teachers treated boys and girls more equally. This finding does suggest caution in simply asserting that having male role models in the classroom is a good thing for boys.

⁹⁴ Myhill, D.A. & Jones, S. She Doesn't Shout at No Girls. Pupils' Perceptions of Gender Equality in the Classroom. *Cambridge Journal of Education*, 36, 1, 63-77.

16 Single Sex Education

16.1 Introduction

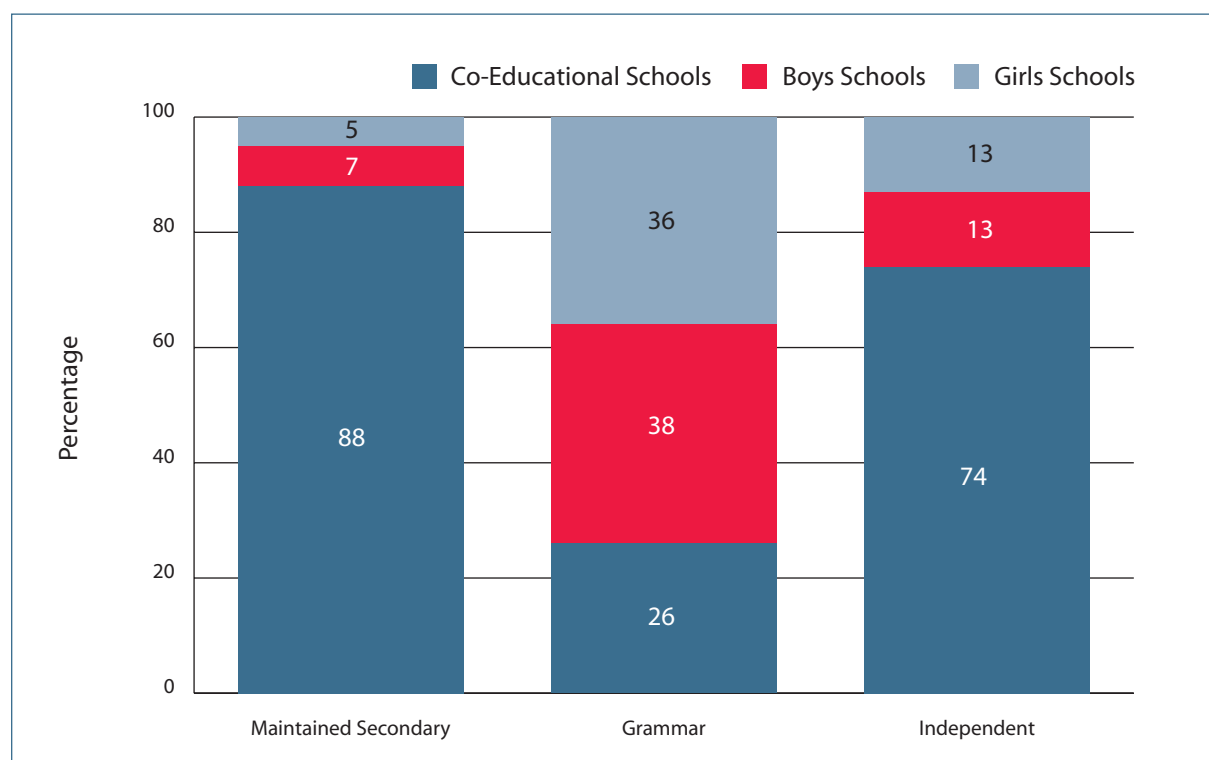
This chapter briefly reviews the evidence on whether single sex education has a differential impact on boys' and girls' attainment compared to co-educational schools. Research on the impact of single sex schools on pupils' preferences and subject choices is also discussed.

16.2 Key Findings

- The “jury is still out” on the impact of single sex schooling on educational attainment. Several international reviews and systematic reviews have failed to identify consistent or strong findings for single sex education.
- There is some evidence that girls' and boys' attitudes to subjects are influenced by whether a pupil attends a single sex school. Boys and girls attending single sex schools are less likely to hold gender stereotypical views about science subjects compared to pupils attending co-educational schools.

16.3 Background

Chart 16.1 shows the differences in the proportion of single sex schools by school type. Only 12 percent of secondary schools (410) are single sex (there are only 7 single sex primary schools) and of these single sex secondary schools, a third are grammar schools. The majority of single sex schools are in the independent sector (57 percent of girls' schools and 60 percent of boys' schools). In total, 75 percent of grammar schools and 26 percent of independent schools are single sex.

Figure 16-1 Proportion of Schools by School Type (2006)

16.4 Impact on Attainment

Smithers and Robinson (2006)⁹⁵ concluded the “*jury is still out*” on the impact of single sex schooling on educational attainment. Several international reviews and systematic reviews have failed to identify consistent or strong findings for single sex education.

Much research examining this issue fails to control for variables that have an impact on attainment e.g. prior attainment; social class and ethnicity. Where such factors are controlled for, the effect of the type of school (single sex or co-educational) is either relatively small or non-existent, and likely to be much less crucial than these other variables.

For example, Spielhofer et al. (2002)⁹⁶ found a modest advantage for girls of single sex education. They examined national GCSE data controlling for the pupils’ prior attainment at Key Stage 2 (sample size of around 370,000 pupils). They found that girls in single sex comprehensive schools achieved about a quarter of a grade better at GCSE than girls in co-educational schools, and the effect was most noticeable for girls with lower prior attainment. They also found that boys in single sex grammar schools also achieved slightly better than their counterparts in co-educational schools. However, they did not control for socio-economic status or ethnicity.

Sullivan (2006)⁹⁷, using the large longitudinal dataset of the National Child Development Survey (17 thousand children born in 1958) found, having controlled for confounding variables, single sex schooling only had a modest positive impact on attainment at 16 (5+ A-C O-Levels), and no impact on boys. There was no impact on later achievement at A-levels or gaining a university degree.

⁹⁵ Smithers, A. & Robinson, P. (2006). *The Paradox of Single-Sex and Co-Educational Schooling*. University of Buckingham.

⁹⁶ Spielhofer, T., O'Donnell, L., Benton, T., Schagen, S. & Schagen, I. (2002). *The Impact of School Size and Single-Sex Education on Performance*, LGA Research Report 33, Slough: NFER.

⁹⁷ Sullivan, A. (2006). *Single-Sex and Co-Educational Schooling: Lifecourse Consequences?* Centre for Longitudinal Studies, Institute of Education.

Mael et al. (2005⁹⁸) conducted a review of 43 statistical studies comparing single sex and co-educational schooling. They found mixed results with 15 having a positive impact and 27 mixed or no differences.

However, Smithers and Robinson's critique of those studies showing a positive impact draws attention to the fact that often other factors were found to be of more importance (e.g. mother's educational level; cognitive ability) or that single sex schooling works, not because the sexes are segregated but for what the separation says about the school.

Additionally, Baker et al (1995⁹⁹) found that the higher achievement of single sex schools tends to be found only in national educational systems where such schools are relatively rare. They compared single sex schools in four countries with differing proportions of single sex schools and found that the smaller the proportion of single sex schools the larger the differential in attainment i.e. that where single sex schools are rare, the school could be seen as more sought after and therefore result in a more selective intake, bringing, in turn, higher academic results.

16.5 Impact on Subject Choice

This section briefly reviews the evidence on whether single sex schooling helps redress the gender imbalance in the subjects boys and girls choose to study.

It is the case that pupils in single sex schools are more likely to be entered for the separate sciences compared to pupils in co-educational schools (Spielhofer et al. 2002¹⁰⁰). Both boys in single sex schools and girls in single sex schools are three times as likely to be entered for the separate science subjects than pupils in co-educational schools. There is therefore not a particular advantage for girls over boys attending single sex schools.

As well as these differences between co-educational and single sex schools in science entries, there is also some evidence that girls' and boys' attitudes to subjects are influenced by whether a pupil attends a single sex school, with differences between boys' and girls' schools. Stables (1990)¹⁰¹ surveyed 2300 13-14 year old pupils attending single sex and co-educational schools. He found statistically significant differences between the school types' attitudes to science. Boys and girls attending single sex schools held less gender stereotypical views on science than those attending co-educational schools: boys in single sex schools were more likely to say they liked biology and girls in single sex schools were more likely to say they liked physics and chemistry.

Age of pupil is a factor in expressing subject preferences. Colley et al. (1994)¹⁰² found that 11-12 year old children in single sex schools were less likely than their counterparts in co-educational schools to express stereotyped subject preferences. However, at 15-16, the type of school a pupil attended did not affect subject preference.

While this is thus some evidence of single sex schooling affecting subject preferences (though not necessarily subsequent subject choice), the overall differences between girls' and boys' preferences is much greater than the difference between pupils in single sex compared to co-educational schools.

⁹⁸ Cited in Smithers, A. & Robinson, P. (2006). *The Paradox of Single-Sex and Co-Educational Schooling*. University of Buckingham.

⁹⁹ Cited in Smithers, A. & Robinson, P. (2006). *The Paradox of Single-Sex and Co-Educational Schooling*. University of Buckingham.

¹⁰⁰ Spielhofer, T., O'Donnell, L., Benton, T., Schagen, S. & Schagen, I. (2002). *The Impact of School Size and Single-Sex Education on Performance*, LGA Research Report 33, Slough: NFER.

¹⁰¹ Stables, A. (1990). Differences Between Pupils from Mixed and Single-Sex Schools in their Enjoyment of School Subjects and their Attitudes to Science and to School, *Educational Review*, 42(3), p.221-230.

¹⁰² Colley, A, Comber, C. & Hargreaves, D. (1994). School Subject Preferences of Pupils in Single-Sex and Co-Educational Secondary Schools, *Educational Studies*, 20(3), p.379-385.



17 School Workforce

17.1 Introduction

This chapter presents time series data on the proportion of male and female teachers and head teachers in primary and secondary schools.

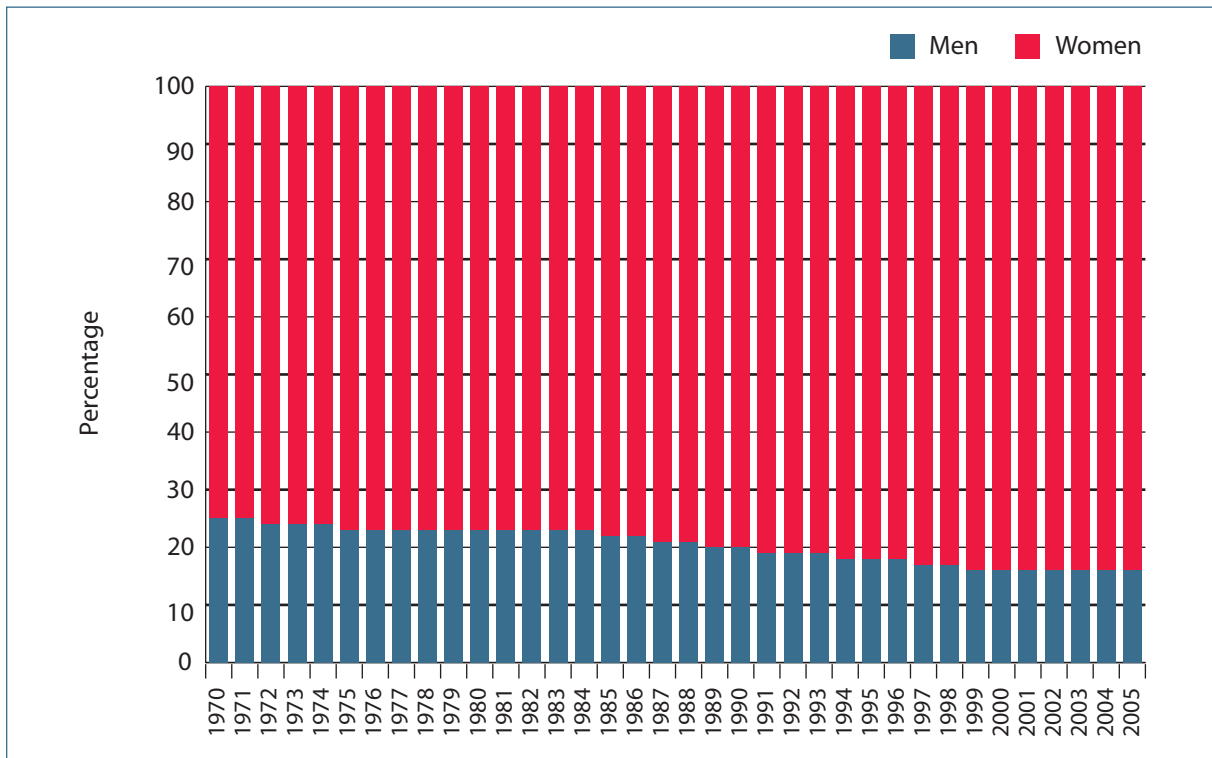
17.2 Key Findings

- The majority of teachers in nursery and primary schools are female (84 percent) and this pattern has become increasingly accentuated over the years.
- The gender split at secondary is more even, with 56 percent of teachers female. This represents a significant change: prior to 1993, a greater proportion of teachers were male.
- Men are more likely to get promoted to headship. While only 16 percent of nursery/primary school teachers are male, 34 percent of head teachers are male. While only 44 percent of secondary school teachers are male, 65 percent of head teachers are male. However, the proportion of female head teachers has increased in recent years.

17.3 Nursery/Primary School

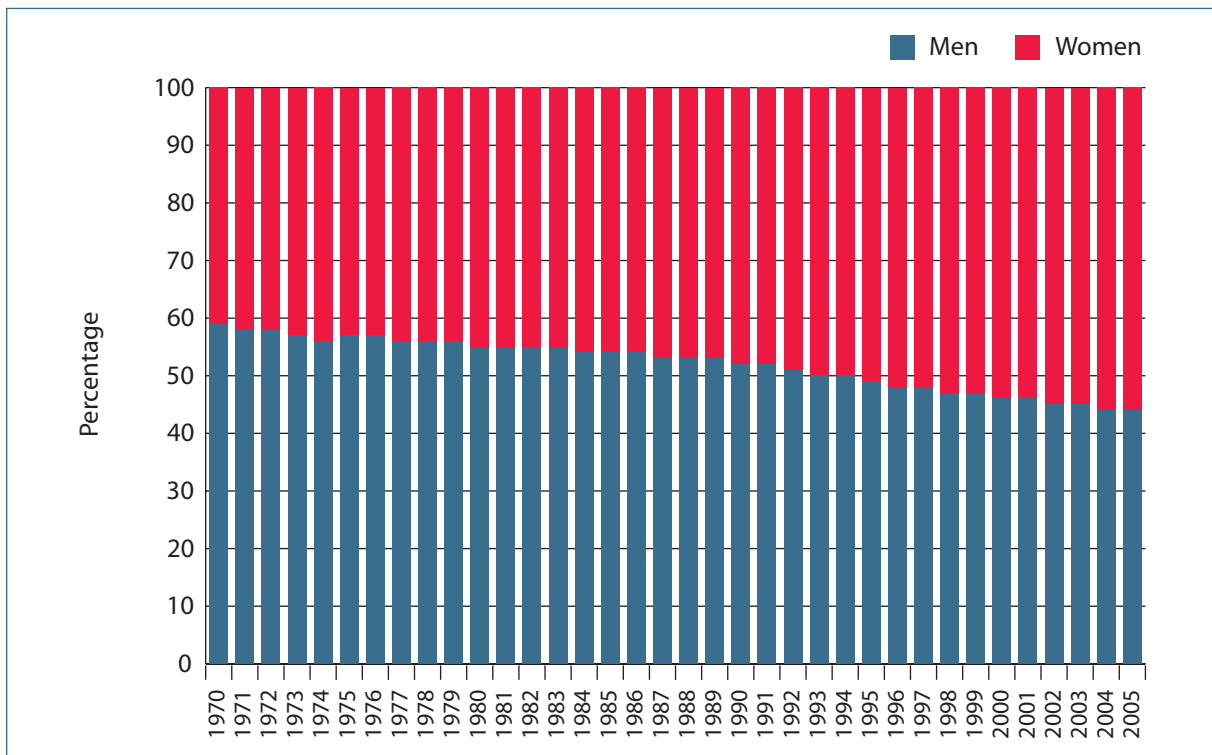
In nursery and primary schools, the majority of teachers are female. In 2005, 84 percent of teachers were female. This is a long-standing pattern, as illustrated in Figure 17-1. However, the pattern has become gradually more marked: in 1970 a quarter of teachers were male compared to only 16 percent in 2005.

Figure 17-1 Gender Split of Full Time Teachers in Nursery and Primary Schools (1970–2005)



Source: DFES Data

Figure 17-2 Gender Split of Full Time Teachers in Secondary Schools (1970–2005)



Source: DFES Data

17.4 Secondary School

In secondary schools, the gender pattern is quite different. Female teachers are in the majority but the split is more even (female teachers: 56 percent; male teachers: 44 percent, 2005 figures).

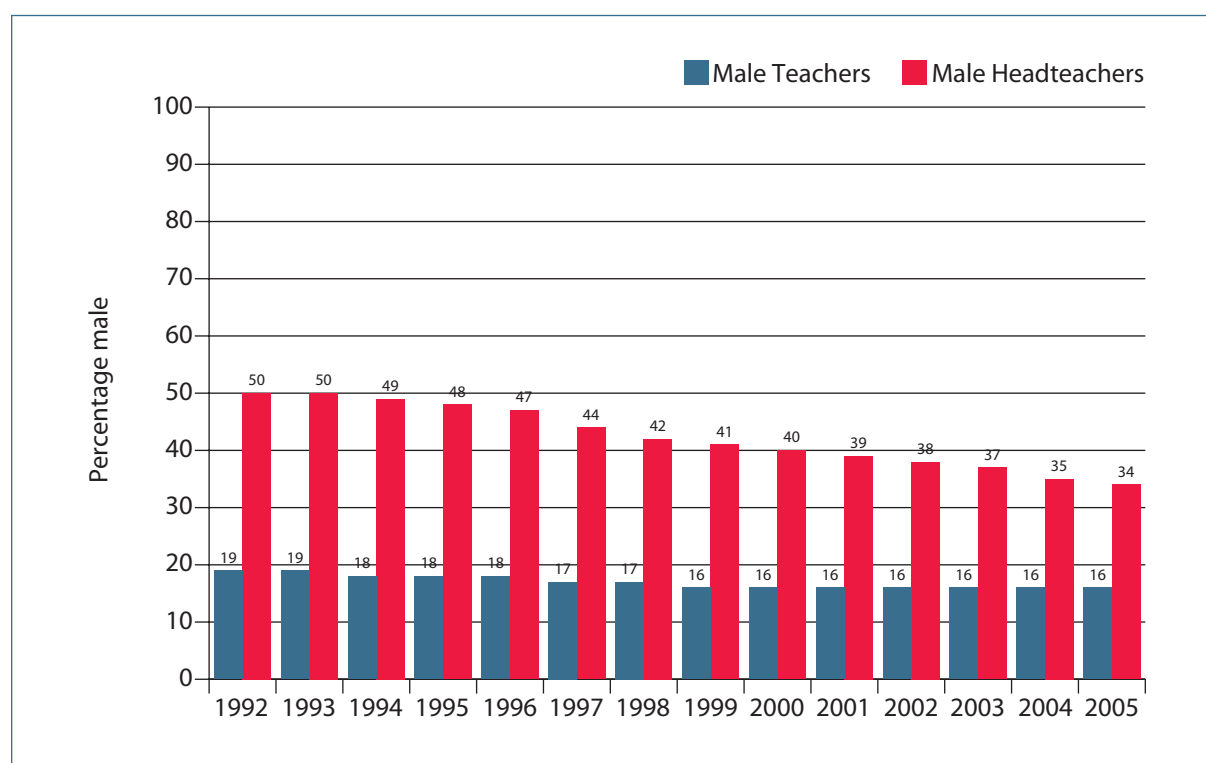
Prior to 1993, there were proportionately more male teachers. Figure 17-2 illustrates this: in 1970, nearly 60 percent of secondary school teachers were male.

17.5 Head Teachers

Men are more likely to get promoted to headship. While only 16 percent of nursery/primary school teachers are male, 34 percent of head teachers are male. While only 44 percent of secondary school teachers are male, 65 percent of head teachers are male.

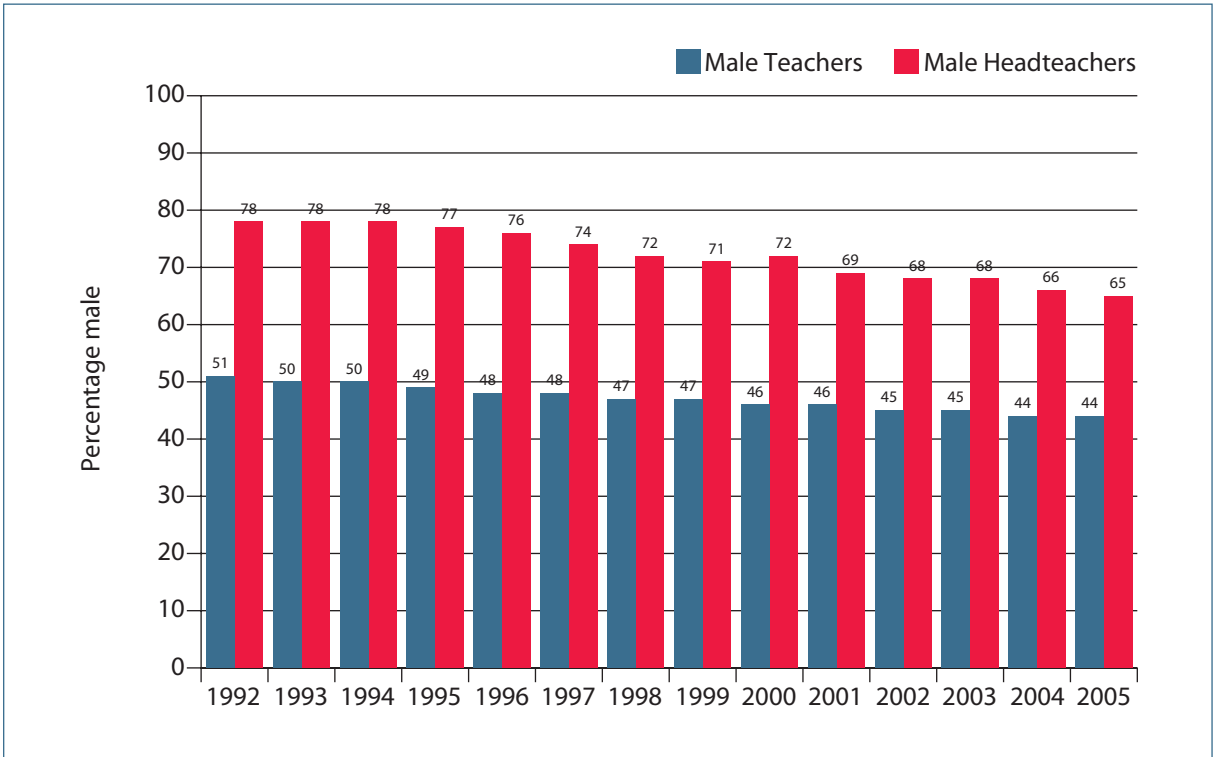
However, Figures 17-3 and 17-4 illustrate how this disparity has improved since the 1990s in both primary and secondary schools with a gradual trend for proportionately fewer men to become head teachers. Whether this change in pattern is due to the overall decrease of male teachers or other factors (such as a change in recruitment practice/promotion of equal opportunities) is not answered by these data.

Figure 17-3 Proportion of Male Teachers and Male Head Teachers, Primary Schools (1992–2005)



Source: DFES Data

Figure 17- 4 Proportion of Male Teachers and Male Head Teachers, Secondary Schools (1992–2005)



Source: DFES Data

18 Table of Figures

Figure 3-1	Ten Most Popular O-Levels/GCSEs (in Rank Order) Over the Last 60 Years	13
Figure 3-2	Physics O-Level/GCSE Time Series (1956–2006): Proportion of Boys vs. Girls	14
Figure 3-3	Chemistry O-Level/GCSE Time Series (1956–2006): Proportion of Boys vs. Girls	14
Figure 3-4	Biology O-Level/GCSE Time Series (1956—2006): Proportion of Boys vs. Girls	15
Figure 3-5	Percentage of Pupils Entered for Each GCSE Subject by Gender (2006)	16
Figure 3-6	Proportion of Pupils Taking Subjects in the Increased Flexibility Programme by Gender (2003)	17
Figure 3-7	Percentage of School Leavers Achieving 5+ A-C (or Pass) O-level or A*-C GCSE by Gender (1962–2006)	18
Figure 3-8	Average Point Score: GCSE and Equivalent Qualifications by Gender (2006)	19
Figure 3-9	GCSE Attainment by Subject and Gender (2006 Revised Figures)	21
Figure 3-10	English O-level/GCSE Time Series: Attainment by Gender (1951–2006)	22
Figure 3-11	Maths O-level/GCSE Time Series: Attainment by Gender (1951–2006)	23
Figure 3-12	Biology O-level/GCSE Time Series: Attainment by Gender (1951–2006)	24
Figure 3-13	Chemistry O-level/GCSE Time Series: Attainment by Gender (1951–2006)	24
Figure 3-14	Physics O-level/GCSE Time Series: Attainment by Gender (1951–2006)	25
Figure 3-15	Double Award Science O-level/GCSE Time Series: Attainment by Gender (1992–2006)	26
Figure 3-16	Single Award Science O-level/GCSE Time Series: Attainment by Gender(1992–2006)	26
Figure 3-17	English literature O-level/GCSE Time Series: Attainment by Gender (1951–2006)	27
Figure 3-18	History O-level/GCSE Time Series: Attainment by Gender (1951–2006)	28
Figure 3-19	Geography O-level/GCSE Time Series: Attainment by Gender (1951–2006)	29
Figure 3-20	French O-level/GCSE Time Series: Attainment by Gender (1951–2006)	30
Figure 3-21	Religious Studies O-level/GCSE Time Series: Attainment by Gender (1951–2006)	31
Figure 3-22	Art and Design O-level/GCSE Time Series: Attainment by Gender (1951–2006)	32
Figure 3-23	Gender Differences at Top and Bottom Grades (2006)	33
Figure 4-1	Percentage of 16 year olds in Full Time Education by Gender (1985–2005)	35
Figure 4-2	Ten Most Popular A-Levels by Gender (in Rank Order) Over the Last 60 Years	36
Figure 4-3	Percentage of Students Entered for A-Level Sciences in Schools and Colleges by Gender (1996–2006)	37
Figure 4-4	Numbers of Students Entered for A-Level Sciences by Gender (2006)	38

Figure 4-5	University Subject Areas Chosen by Students with A-Level Physics by Gender	38
Figure 4-6	English A-Level Time Series: Attainment by Gender (1951–2006)	40
Figure 4-7	Maths A-Level Time Series: Attainment by Gender (Pure Maths 1951–2006)	40
Figure 4-8	A level Grade Distribution: All Subjects by Gender (2006)	41
Figure 4-9	A level Grade Distribution: English by Gender (2006)	42
Figure 4-10	A level Grade Distribution: Maths by Gender (2006)	42
Figure 4-11	A-Level Pass Rate by Subject and Gender, 2006 (Ranked by Gender Gap)	43
Figure 4-12	Percentage of 16-18 year Old Candidates Achieving Two or More GCE/VCE A-Level Passes by Gender (1994–2006)	44
Figure 4-13	Percentage of Pupils Achieving an A-Grade at A-level by Gender (1996–2006)	45
Figure 4-14	A-Level Attainment at Grade A by Subject and Gender (2006) Ranked by Gender Gap	46
Figure 4-15	A-Level Attainment at Grade E by Subject and Gender (2006)	47
Figure 5-1	Attainment on the 13 Assessment Scales of the Foundation Stage Profile by Gender (2006)	49
Figure 5-2	Percentage of Pupils Achieving Expected Level by Gender and Percentage Point Difference Between Girls and Boys, Key Stages 1–4 (1997–2006)	51
Figure 5-3	Foundation Stage / Key Stages English/Reading Gender Gap (2006 Revised Figures)	53
Figure 5-4	Foundation Stage / Key Stages Maths Gender Gap (2006 Revised Figures)	54
Figure 5-5	Gender Difference: High Achievers (Girls-Boys) (2006)	55
Figure 5-6	Gender Difference: Low Achievers (Girls-Boys) (2006)	55
Figure 5-7	Contextual Value Added Scores for Girls (2006 Co-Efficients)	56
Figure 6-1	Effects of FSM, Ethnicity and Gender: 5+ A*-C GCSE (2006)	59
Figure 6-2	The Effect of Various Pupil Characteristics on the Odds of Being a Low Attainer at Key Stage 2 (2004)	60
Figure 6-3	The Effect of Various Pupil Characteristics on the Odds of Being a Low Attainer at Key Stage 4 (2004)	60
Figure 6-4	Percentage of Pupils Gaining 5+ A*-C GCSEs by Gender and Occupational Class (2004)	62
Figure 6-5	The Gender Gap for FSM and Non-FSM pupils (5+ A*-C GCSEs, 2006)	63
Figure 6-6	The Larger Gender Gap for Black Caribbean pupils (5+ A*-C GCSEs, 2006)	64
Figure 6-7	The Larger FSM gap for White British Pupils Compared to Black Caribbean Pupils (5+ A*-C GCSE, 2006)	65
Figure 6-8	Gender x Ethnicity x FSM Interaction: Percentage of pupils gaining 5+ A*-C GCSEs (2006)	66
Figure 6-9	White British Attainment at GCSE by FSM and Gender (2006)	67
Figure 6-10	Percentage of Pupils with FSM Gaining 5+ A*-C GCSEs by Ethnic Group and Gender (2006)	68
Figure 6-11	Gender x Deprivation Interaction: Percentage of Pupils Gaining 5+ A*-C GCSEs (2005)	70
Figure 6-12	GCSE Achievement using Different Measures of Deprivation by Gender, FSM and Ethnicity (2005)	71

Figure 7-1	Gender Difference at O-level/GCSE and Proportionate Differences in Female/Male Achievement	73
Figure 8-1	Number of Pupils Not Attaining 5+ A*-C GCSEs (2006)	76
Figure 8-2	Proportion and Numbers of Low Attainers at GCSE	78
Figure 11-1	International Comparison of Maths Scores by Gender (PISA 2000)	85
Figure 11-2	International Comparison of Literacy Scores by Gender (PISA 2000)	87
Figure 11-3	International Comparison of Scientific Literacy by Gender (PISA 2000)	88
Figure 12-1	Incidence of SEN Type by Gender Across Primary, Secondary and Special Schools (2006)	90
Figure 12-2	Percentage of Pupils Identified with Behavioural, Emotional and Social Difficulties by Gender and Ethnicity (School Action Plus, Secondary School, 2004)	92
Figure 12-3	Percentage of Pupils with Moderate Learning Difficulty by Gender and Ethnicity (School Action Plus, Secondary School, 2004)	92
Figure 13-1	Percentage of Permanent Exclusions by Reason for Exclusion and Gender (2005)	95
Figure 13-2	Percentage of Fixed Period Exclusions by Reason for Exclusion and Gender (2005)	95
Figure 13-3	Percentage of Permanent and Fixed Period Exclusions by Ethnic Group and Gender (2005)	96
Figure 13-4	Proportion of Fixed Period Exclusions by Gender and FSM status (2005)	96
Figure 13-5	Time Series Showing Percentage of School Population with a Permanent Exclusion by Gender (1998–2005)	97
Figure 13-6	Time Series of Ratio of Boys to Girls with a Permanent Exclusion (1998–2005)	98
Figure 13-7	Percentage of School Absence by Gender (2005/06)	98
Figure 14-1	Gender Differences in Learner Characteristics (PISA 2000)	103
Figure 14-2	Entry by Tier and Gender for GCSE Maths (2000)	111
Figure 16-1	Proportion of Schools by School Type (2006)	119
Figure 17-1	Gender Split of Full Time Teachers in Nursery and Primary Schools (1970–2005)	122
Figure 17-2	Gender Split of Full Time Teachers in Secondary Schools (1970–2005)	122
Figure 17-3	Proportion of Male Teachers and Male Head Teachers, Primary Schools (1992–2005)	123
Figure 17-4	Proportion of Male Teachers and Male Head Teachers, Secondary Schools (1992–2005)	124

You can download this publication at:

www.dfes.gov.uk/research

For further information, please contact LIZ ISON
Liz.Ison@dfes.gsi.gov.uk or MICHELE WEATHERBURN
Michele.Weatherburn@dfes.gsi.gov.uk

Copies of this publication can be obtained from:

DfES Publications

PO Box 5050

Sherwood Park

Annesley

Nottingham NG15 0DJ

Tel: 0845 6022260

Fax: 0845 6033360

Textphone: 0845 60 555 60

Please quote the ref: 00389-2007BKT-EN

PPXXX/D16(7038)/0407/XX

ISBN: 978-1-84478-931-3

© Crown copyright 2007

Published by the Department for
Education and Skills on behalf of
HM Government

Extracts from this document may be reproduced for
non-commercial research, education or training
purposes on the condition that the source is
acknowledged. For any other use please contact
HMSOlicensing@cabinet-office.x.gsi.gov.uk

75% recycled

This leaflet is printed
on 75% recycled paper



When you have finished with
this leaflet please recycle it