An analysis of the gender divide - from primary school to the workforce

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Dispelling simplistic representations of boys' underachievement

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Media attention on 'underperforming boys' has paid little attention to important subtleties in the nature of the problem, and in the findings from research.

In his influential 2001 pamphlet, John Marks failed to highlight that both boys and girls have improved, but boys have improved less (rather than boys' performance getting worse in absolute terms). It's not all boys at all levels/ages who are underperforming.

There are complex social phenomena behind the differences in boys' and girls' relative performance - including gender-stereotypical peer group pressure amongst boys which reinforces low levels of engagement with learning (Warrington M, Younger M. 2005).

This is not a new problem; if raw scores in the 11+ had been used to determine selection, then grammar schools in the 50s and 60s would have been populated almost exclusively by girls. Likewise, the historical figures for O level achievement in the 1960s and 70s show a gap in gender achievement, roughly 5% difference in pass rate, 10% in some subjects (eg languages) (Murphy R. 1980).

Understanding where to look to explain gender differences in attainment

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It's complex

There are no simple explanations for the gender gap; several factors are likely to have an influence: pupil grouping, assessment techniques, the curriculum, teaching styles, teacher expectations, role models, and the way teachers reward and discipline. Ofsted have evidence of gendered behaviour by teachers – including setting, attention-management, subject choice advice, and decisions about entry to tiered papers….and more…

It all begins early

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Babies are actively processing speech *before* birth; they can recognise a story that they have heard while still in the womb

DeCasper, A. J. and Spence, M. J. (1986). Prenatal maternal speech influences: newborns' perception of speech sounds. *Infant Behavior and Development*, 9, 133–50.

Maternal-infant bonding is crucial to engagement with the world

Oates, J. M. and Stevenson, J. (2005) 'Temperament and development', in Oates, J. M., Wood, C. P. and Grayson, A, in Psychological Development and Early Childhood, Oxford/Milton Keynes, Blackwell Publishing/The Open University

Gendered behaviour is an insidious element in care and development of the child

Seavey et al (1975) The effect of gender labels on adults responses to infants. Sex Roles, 1, 103-109.

Condry and Condry (1976) Sex differences: a study of the eye of the beholder. Child Development 47, 812-819.Stern and Karraker (1989) Sex stereotyping of infants: A review of gender labelling studies. Sex Roles, 20, 501-522.

Early experiences affect cognitive development in a profound way; babies in non-inflected language settings lose the acuity to differentiate certain sounds in inflected languages

Soderstrom, M. 2002. The acquisition of inflection morphology in early perceptual knowledge of syntax. Dissertation Johns Hopkins U. Saffran, JR, A. Senghas, and J.C. Trueswell. 2001. The acquisition of language by children. *Proc Natl Acad Sci U S A.* 98 23 12874-12875. Slobin D.I. ed. 1985. *The Cross-Linguistic Study of Language Acquisition.* Erlbaum

Differences in PISA in the performance on maths scales of different nations can be explained in part by different cultural behaviours

Tymms P 2005

Evidence of physiological differences in brain structure - which may give rise to subtle preferences and impact on mathematical attainment

- Strong evidence on identity and self-concept
- Strong evidence on social and economic structures
- Strong evidence on the impact of schooling
- When is ‘preference’ a form of systematic disadvantage?
- Is difference always bias? The difficulty, for policy, of knowing ‘when to push’

Female issues: global
AFGHANISTAN

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More than 90 percent of Afghan women living in rural areas are illiterate (source US Aid)

Afghanistan's economy was devastated by nearly a quarter century of warfare and many widows became the sole providers for their families. (source US Aid)

Some of the schools that educate girls and boys continue to be targeted by groups which oppose the integration and empowerment of girls in Afghanistan. In 2014-15 there were 163 verified incidents involving schools; serious threats against female teachers and female students including attacks on students. 469 schools (of 16,000) remain closed due to insecurity (source: UN Office of the Special Representative of the Secretary General for Children and Armed Conflict)

Since 2002, the number of girls attending school increased by over 30 percent; however, an estimated 1.5 million school-age girls are still not enrolled in classes (source: Trust in Education)

34 percent of children enrolled in school are girls, although this figure hides large disparities from province to province, with enrollment as low as 15 percent in some areas (source: UNICEF)

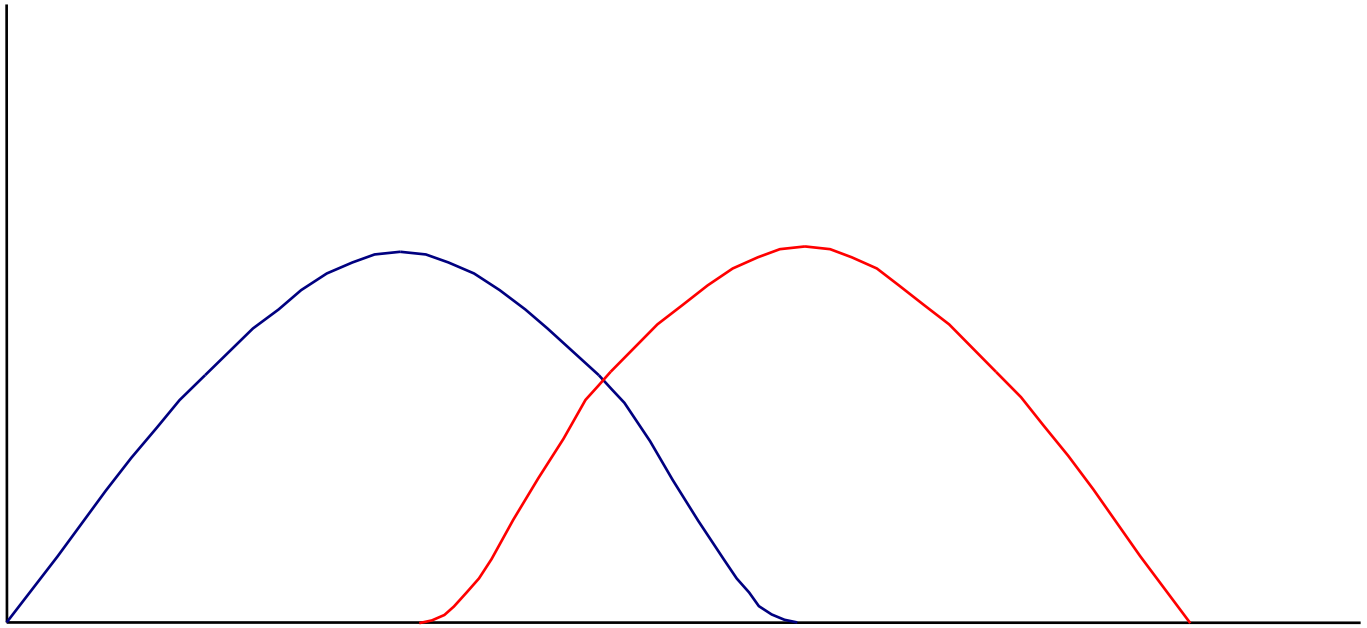
Female gender issues
FINLAND

The percentage of students transitioning to tertiary education is lower than the OECD average: only 20%.

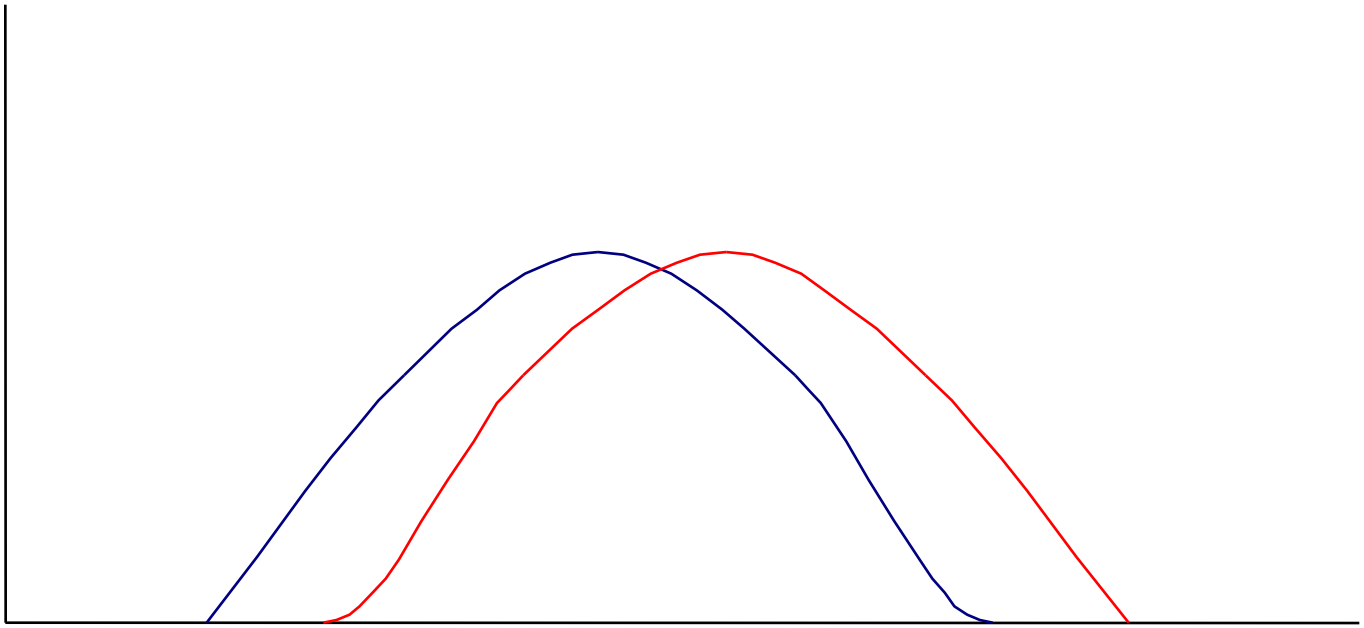
Women constitute 56% of university students. More women study subjects in the social and health-care sectors and in the humanities, art and education sectors. Only 22% of students studying engineering sciences are women; and 32% of students in mathematics and computer science are women

However this is significantly higher than in other OECD countries.

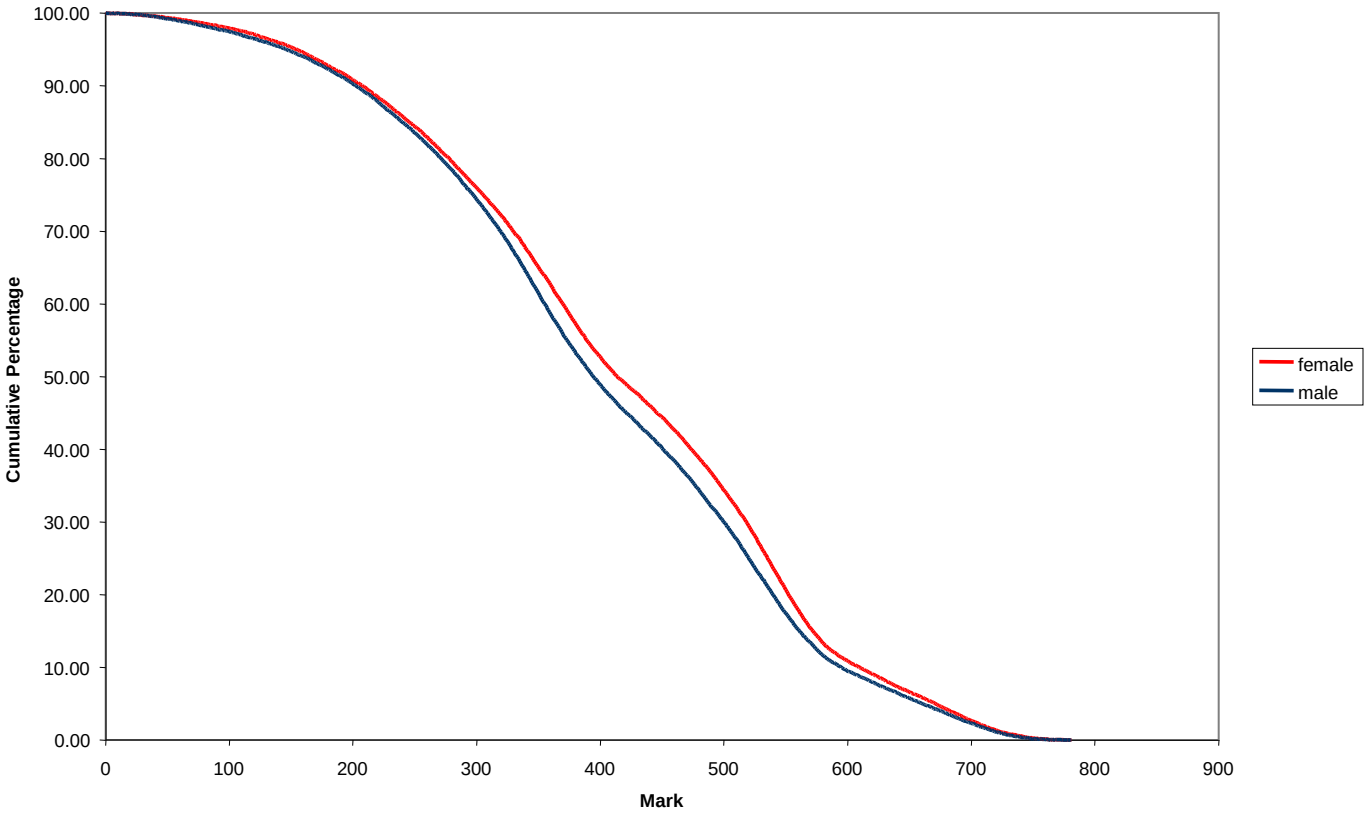
Putative relationship between ♀ ♂: version #2



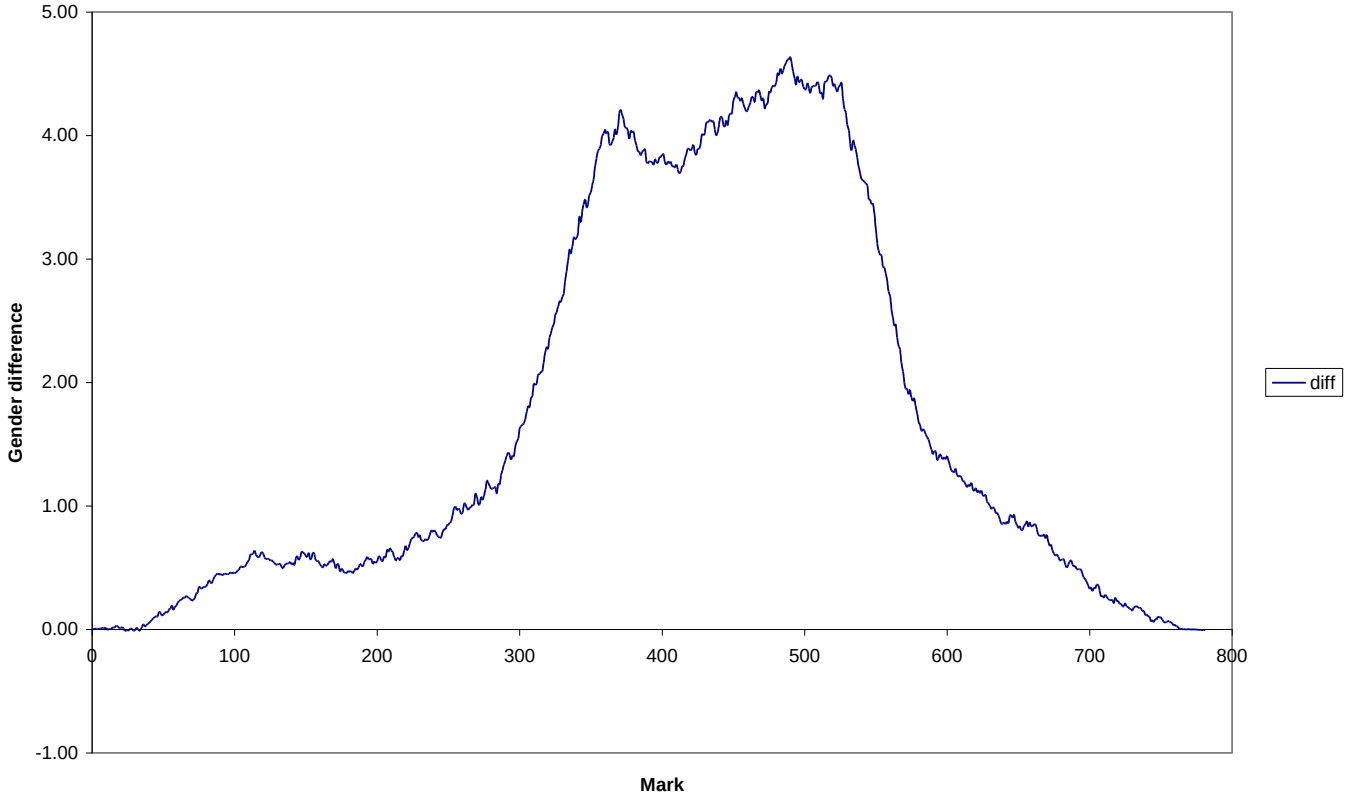
Putative relationship between ♀ ♂: version #3



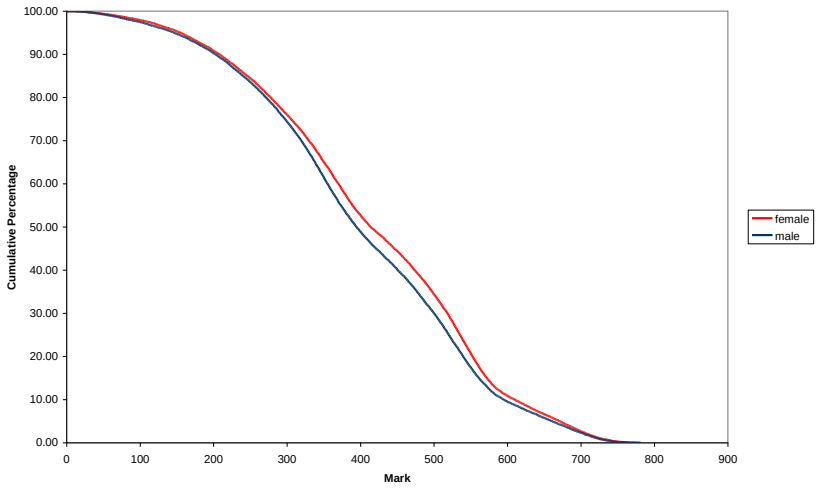
Examples of a mark distribution for an OCR Mathematics GCSE

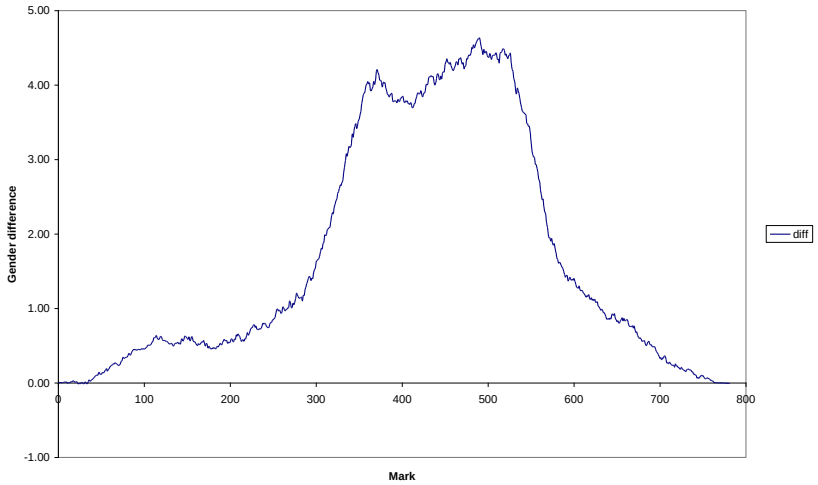


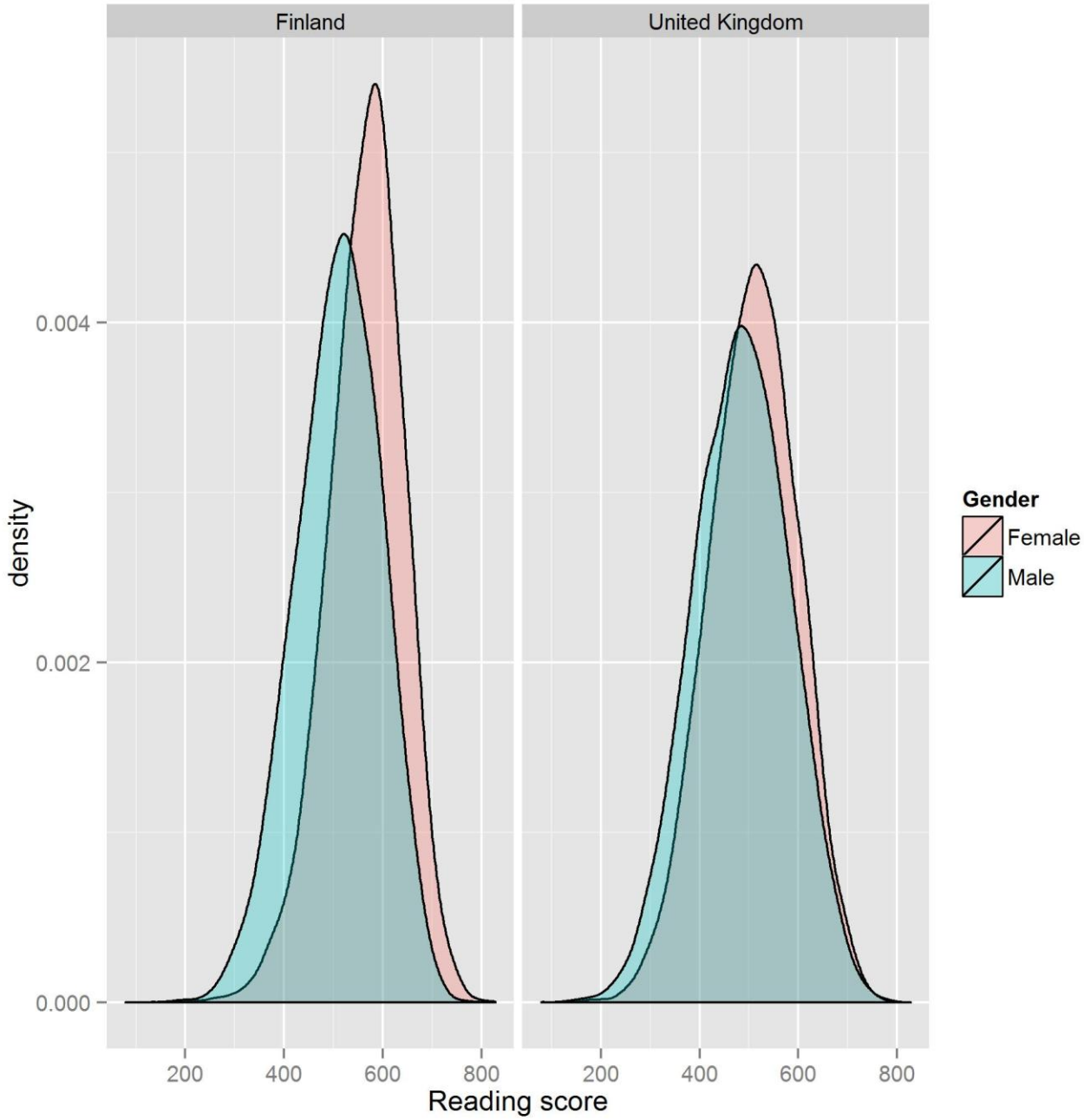
Examples of a mark distribution for an OCR Mathematics GCSE



Examples of a mark distribution for an OCR Mathematics GCSE







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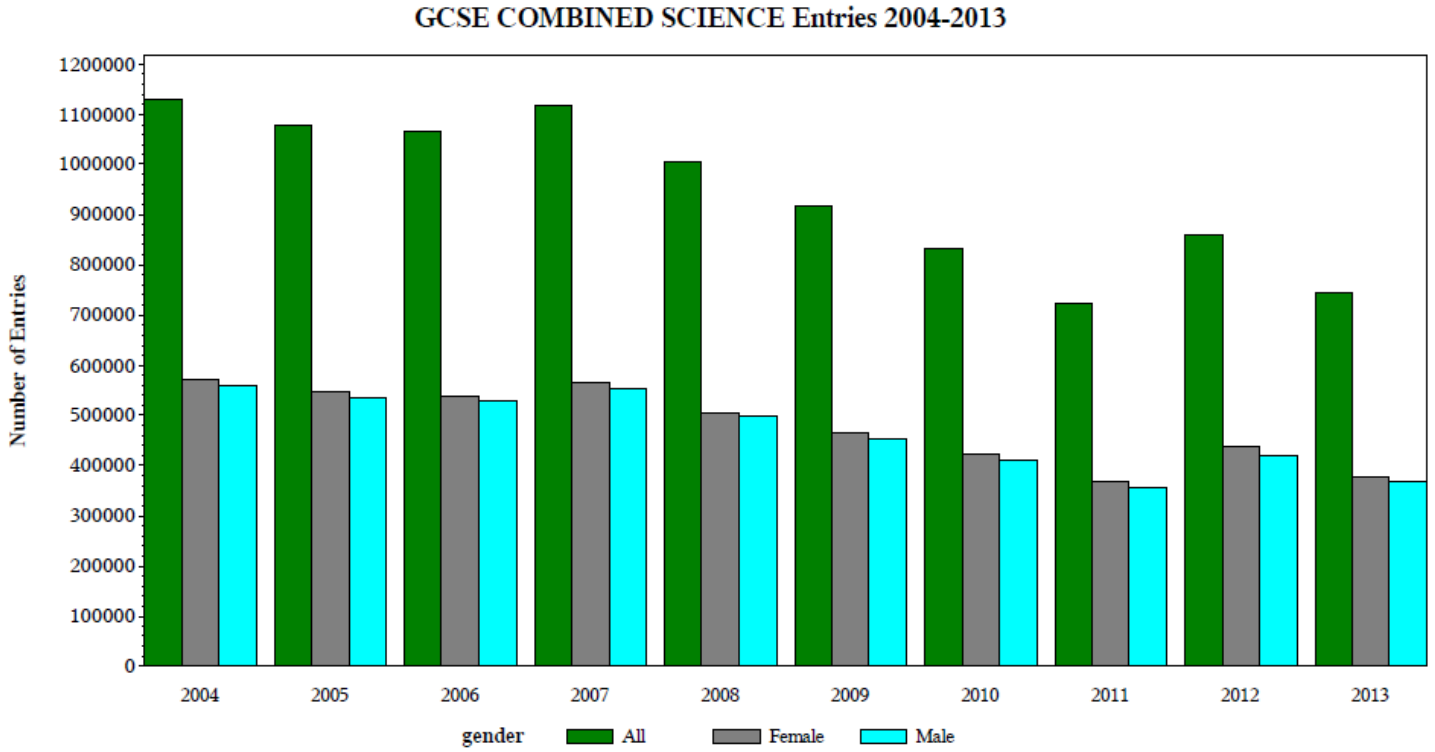
Numbers of GCSE entries in COMBINED SCIENCE 2004-2013

gender	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Male	558337	533093	530015	553037	498185	453682	408896	355485	420876	366575
Female	572229	545658	537065	563835	506611	465132	421751	368632	439204	377320
All	1130624	1078811	1067093	1116897	1004806	918839	830660	724122	860082	743904



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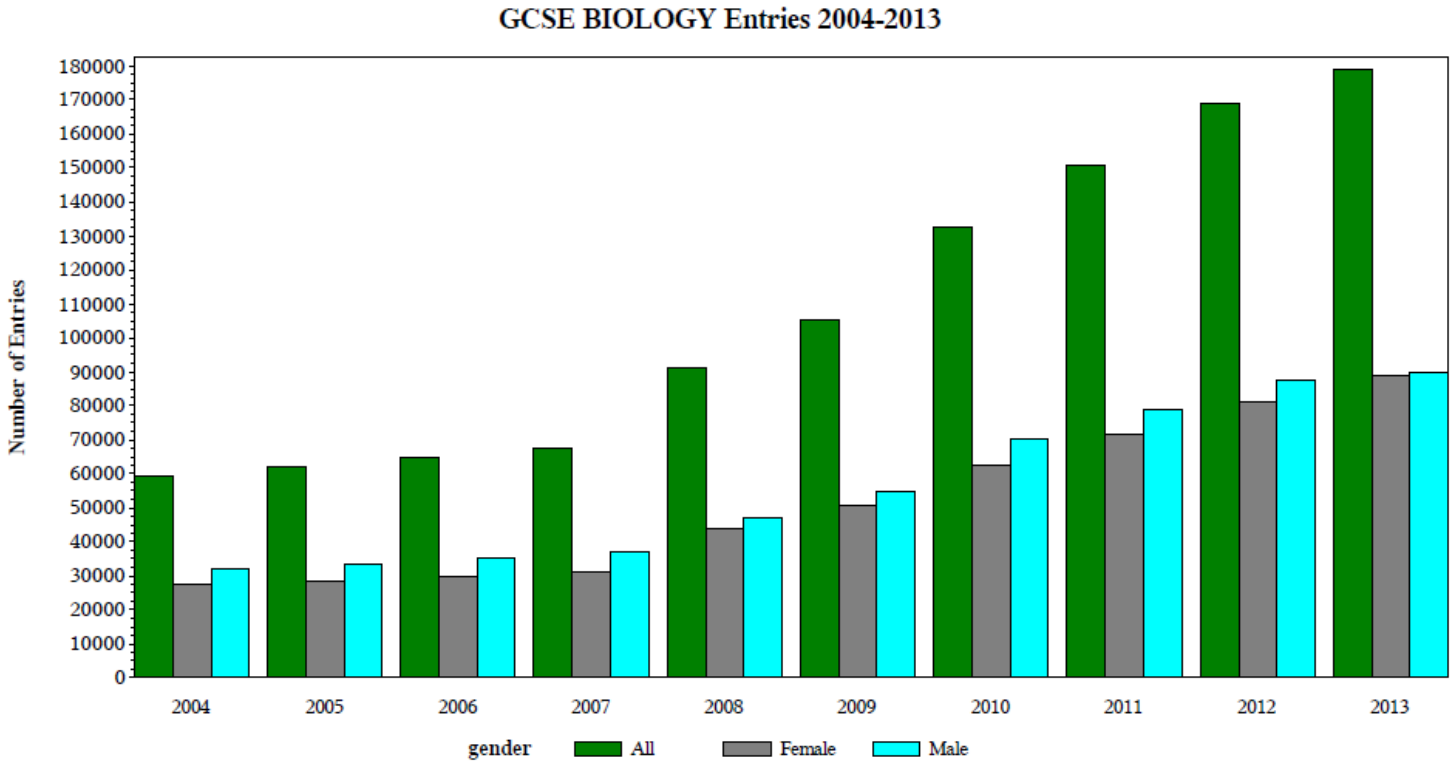
Numbers of GCSE entries in BIOLOGY 2004 - 2013

gender	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Male	32071	33198	35138	36914	47147	54783	70127	79018	87735	89988
Female	27345	28685	29876	30883	43881	50390	62614	71642	81069	88778
All	59431	61884	65018	67800	91029	105176	132742	150660	168804	178766



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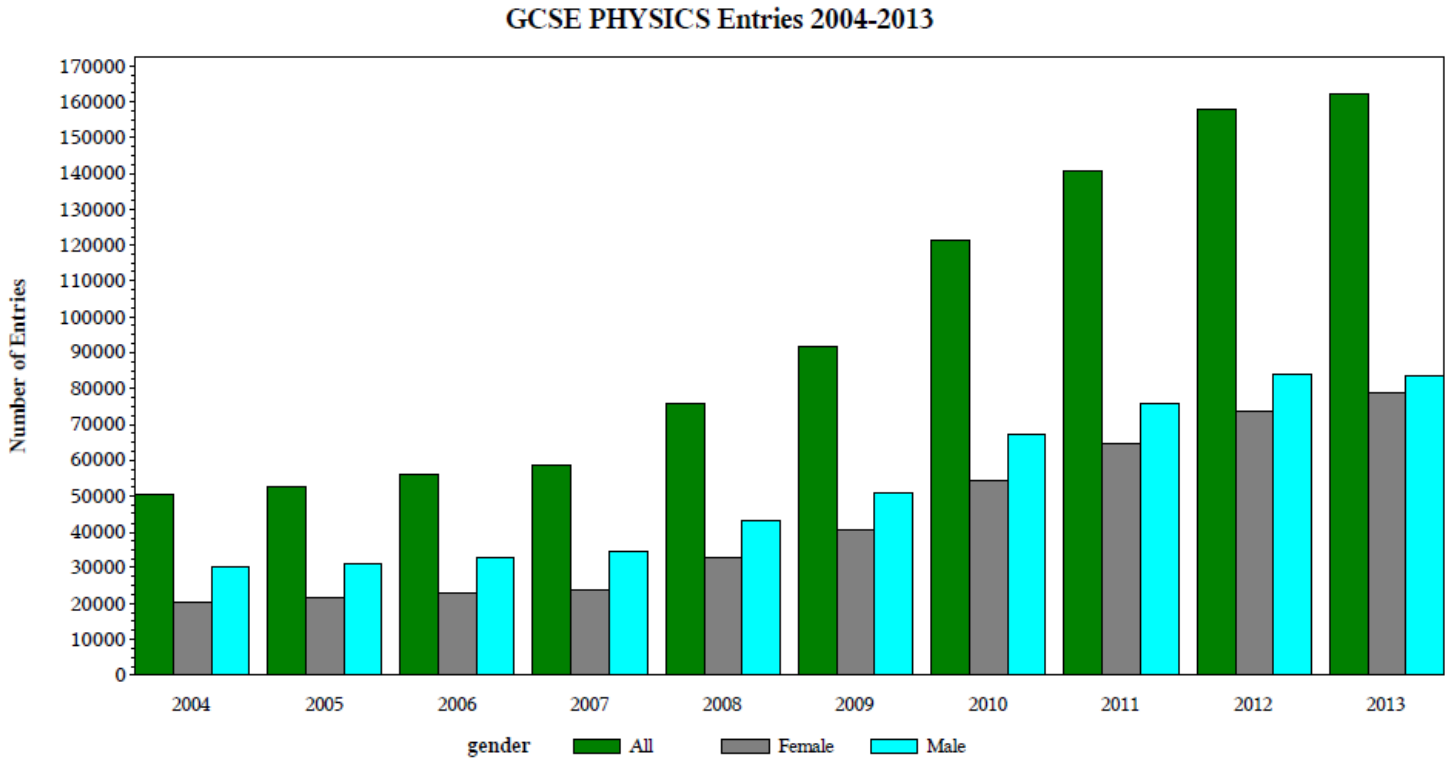
Numbers of GCSE entries in PHYSICS 2004-2013

gender	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Male	30254	31156	33025	34408	43115	51052	67023	75908	84183	83333
Female	20182	21409	22999	23987	32580	40527	54363	64702	73532	78820
All	50446	52566	56025	58395	75695	91581	121386	140610	157715	162153



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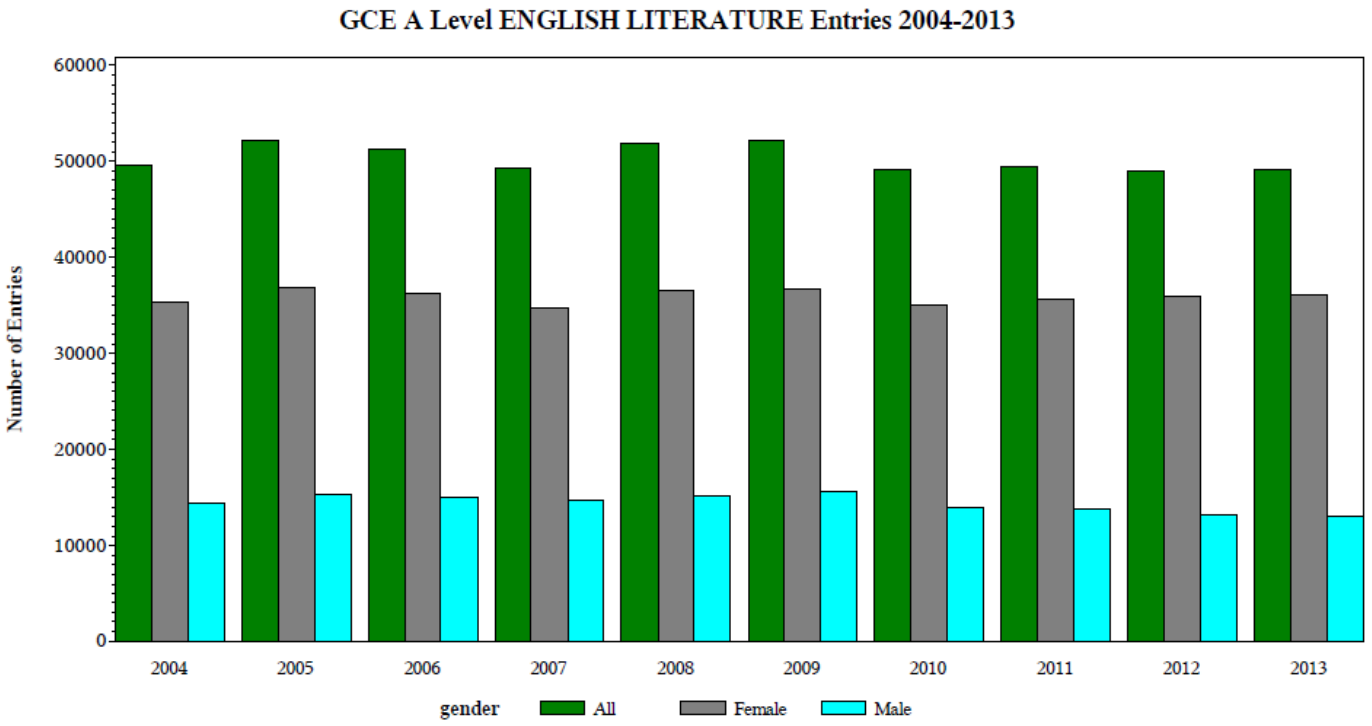
Numbers of GCE A Level entries in ENGLISH LITERATURE 2004-2013

gender	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Male	14313	15349	15016	14587	15214	15575	14009	13821	13163	12986
Female	35261	36778	36252	34746	36552	36582	35095	35657	35906	36118
All	49577	52128	51268	49333	51766	52157	49105	49478	49070	49104



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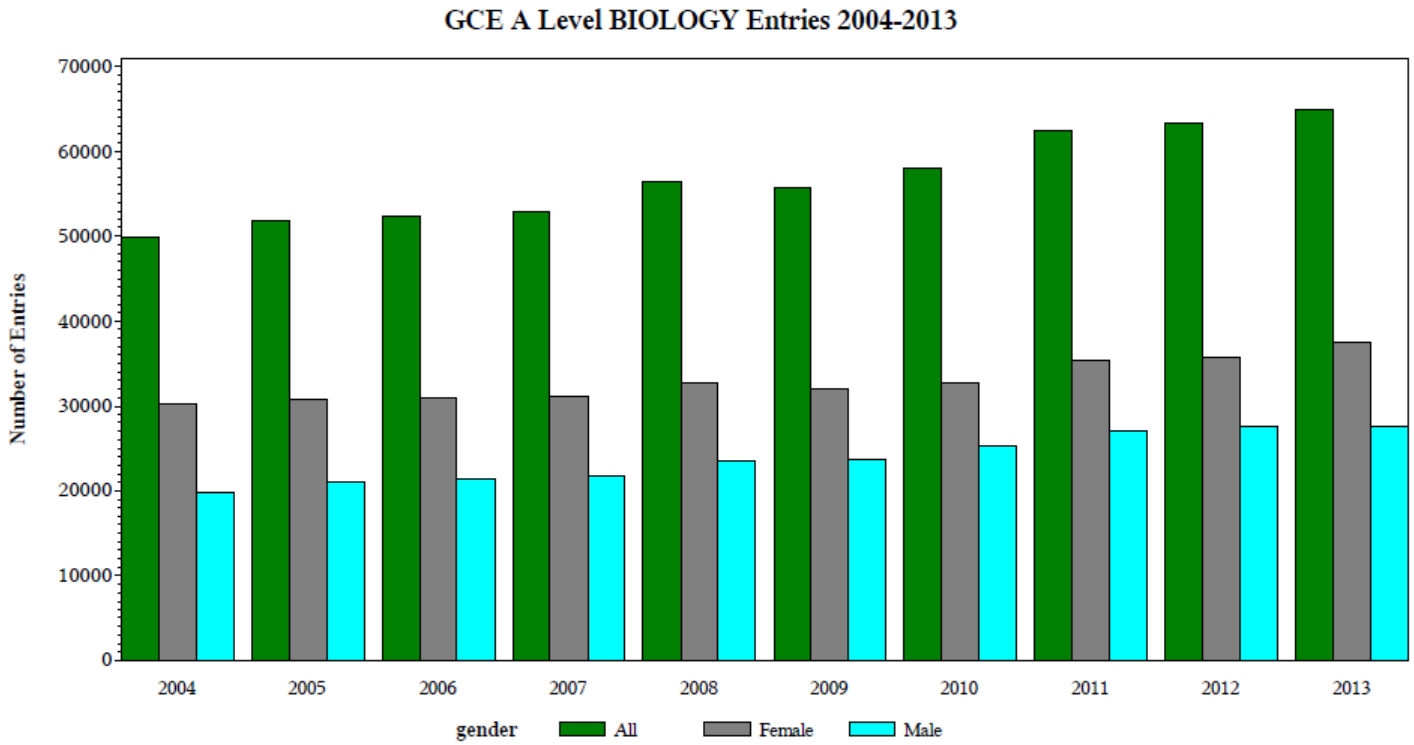
Numbers of GCE A Level entries in BIOLOGY 2004 - 2013

gender	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Male	19708	21077	21473	21717	23611	23766	25285	27104	27574	27455
Female	30128	30731	30885	31142	32704	31933	32742	35334	35848	37512
All	49836	51809	52359	52860	56316	55700	58027	62438	63422	64967



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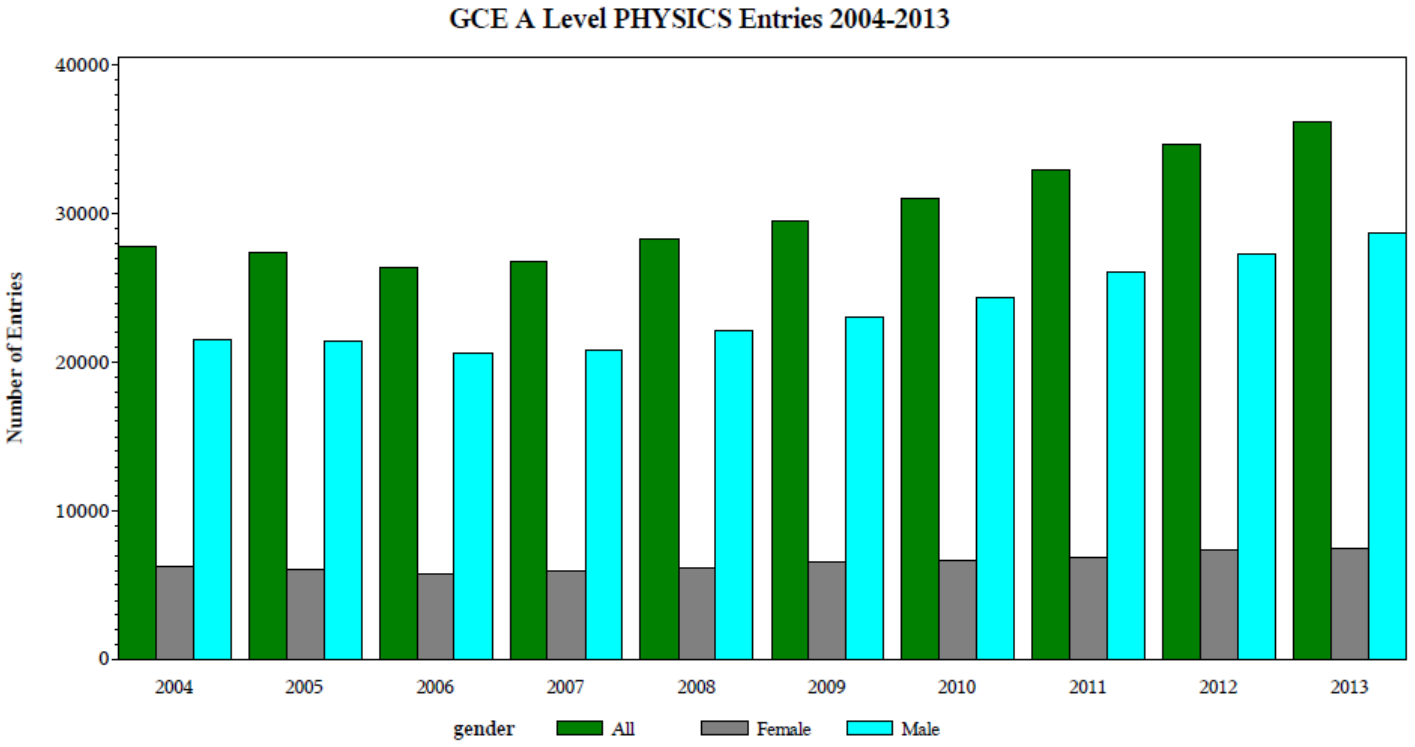
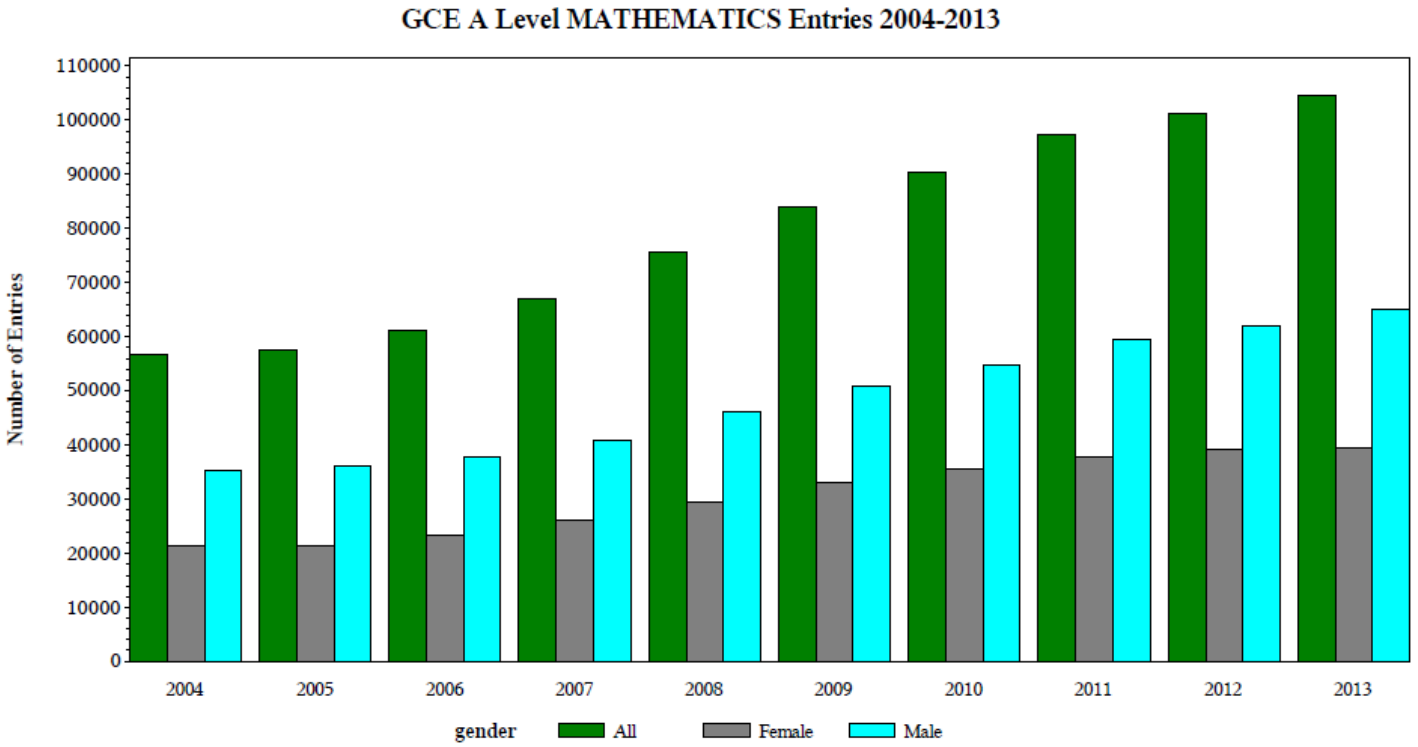
Numbers of GCE A Level entries in PHYSICS 2004-2013

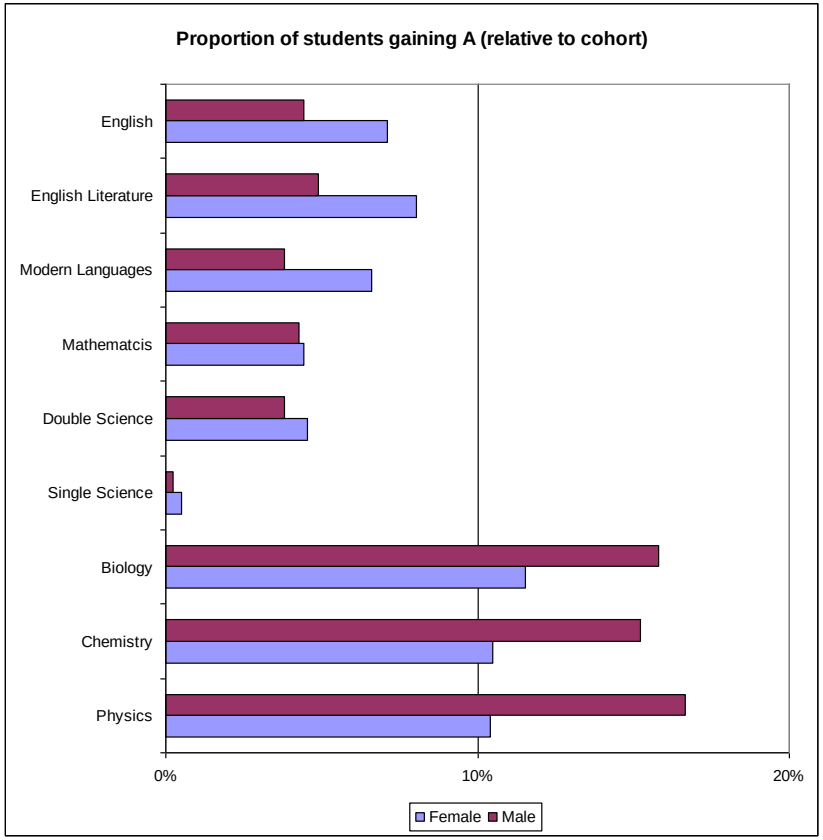
gender	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Male	21557	21348	20570	20817	22085	22999	24368	26135	27280	28657
Female	6202	6021	5786	5965	6186	6557	6685	6882	7405	7498
All	27760	27370	26356	26782	28271	29556	31054	33017	34685	36155

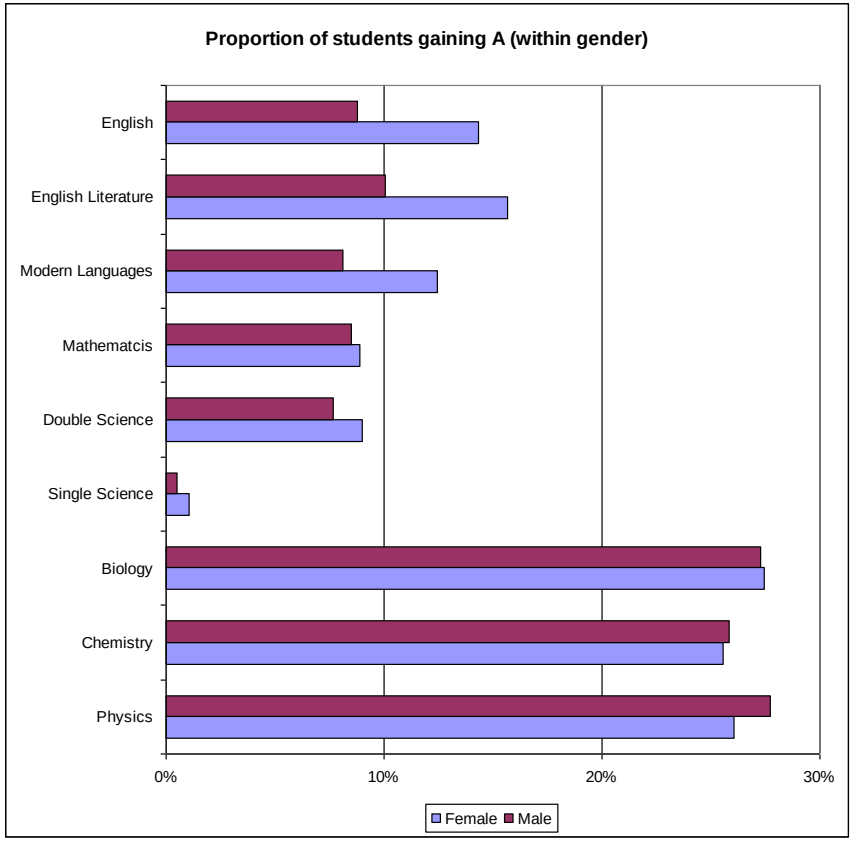


Numbers of GCE A Level entries in MATHEMATICS 2004-2013

gender	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Male	35251	36013	37804	40944	46169	50797	54705	59493	62033	65049
Female	21449	21424	23347	26029	29284	33015	35552	37726	39022	39519
All	56708	57440	61151	66977	75457	83814	90257	97220	101055	104571




Proportion of students gaining A (relative to cohort)
English
English Literature
Modern Languages
Mathematcis
Double Science
Single Science
Biology
Chemistry
Physics
0%
10%
20%
Female
Male


Proportion of students gaining A (within gender)
English
English Literature
Modern Languages
Mathematcis
Double Science
Single Science
Biology
Chemistry
Physics
0%
10%
20%
30%
Female
Male

Occupations	Man %	Woman %	Both %	N
Bus Driver	56	1	43	926
Typist	3	44	53	923
Accountant	14	15	71 (58)	921
Sales Assistant	18	17	65	925
Nurse	1	54	45 (29)	927
Secondary School Teacher	10	15	75	925
Firefighter	77	1	22	924
Electrician	86	2	12	921
Cleaner	7	60	33	921
Bank Manager	32	6	62	926
Builder	92	1	7	926
Factory Worker	32	8	60	924
Scientist	18	4	78 (50)	916
Journalist	11	15	74	922
Hotel Receptionist	5	42	53	925
Police Officer	30	1	69	924
Supermarket Shelf Filler	12	17	71	921
Hotel Manager	36	7	57	923
Primary School Teacher	3	26	71	921
Painter and Decorator	47	4	49	920
Traffic Warden	23	13	64	925
Solicitor	23	11	66	921
Bank Clerk	15	17	68	918
Car Mechanic	86	1	13	922
Road Sweeper	75	4	21	923
Doctor	33	2	65	921
Computer Programmer	36	6	58	922
Chef	46	4	50	921
Fashion Designer	2	66	32	921

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Percentage breakdown of Key stage 2 Primary school pupils who stated that occupations were for a man, woman or both

Key stage 1 breakdown in brackets

Gender and subject choice

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- While girls are now achieving better academic results than boys at age 16, relatively fewer young women are choosing science or science-related subjects for further study.
- Boys dominate in maths, science and technology at A level and far more men than women study these subjects in higher education. This has significant implications for men's and women's career choices and future earnings: 60% of working women are clustered in only 10% of occupations; and men are also under-represented in a number of occupations.

Education utilisation – labour market linkage
Qualification requirement by type of job

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- Although female first degree graduates were more likely than their male peers to be in health professions or associate professions, they were less likely to report that their degree was a formal requirement and more likely to say that it has not been required for obtaining their employment. Many of the female graduates employed in these occupations were nurses, of which **only around half (54%) reported that a degree was a formal requirement.** In contrast, relatively few male graduates went into nursing and of those working in the health professions, a higher proportion were employed as doctors, for which a medicine degree, unsurprisingly, was formally required.

- Of first degree graduates entering work as business and financial professionals and associate professionals, 52.6% were females and 47.4% were males. **Males working in these types of jobs, however, were more likely than their female counterparts to believe that their degree was a formal requirement,** with 41.3% noting that this was the case compared with 32.5% of females. Female graduates were also more likely to report that their qualification was not required: 21% reported that this was the case compared with 17.5% of males.

- Female graduates were not only less likely than male graduates to be in IT occupations, **they were less likely to be in IT jobs for which a degree qualification was a requirement.**

Finding schools with a consistent record in closing the gap Younger M, Warrington M et al 2005

Couldn't find the schools

Four classes of intervention strategies

Pedagogic – e.g. space and time to talk and reflect about reading
Individual – e.g. realistic and challenging target-setting
Organisational – e.g. selective use of single-sex teaching groups
Socio-cultural – e.g. paired reading schemes between yr3 and yr5 pupils

Their research '…does not support the view that there is a case for boy-friendly pedagogies. Pedagogies which appeal to and engage boys are equally girl-friendly. They characterise quality teaching, and as such are just as suitable and desirable for girls as for boys…'

Notable successes

Open University

Singapore polytechnics

Including fundamental requirements in the National Curriculum in England - school science, key elements of Maths

‘Signalling’, combined with objective factors: the case of Germany – primary school hours and deliberate post-war fiscal strategy

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Kate Purcell on control factors in employment

IPPR research October 2015

Over the past two decades, employment among single parents – mostly women – has risen dramatically from 47.1% in 1996 to 65.7% in 2014. The rise in single parenthood contributed to an overall increase in maternal breadwinners from 23% in 1996 to 33% in 2013.

A substantial rise between 2008 and 2011 was fuelled by an increase in maternal breadwinners in couple households highlighting the accelerating decline in pay and job security in traditional male jobs in the aftermath of the financial crash. However, female breadwinner earnings are in the bottom half of the income scale, in contrast to the Netherlands, where female breadwinners are represented evenly across all income brackets.