

in brief...

Under pressure: gender differences in responding to exam stakes

Do girls and boys respond differently to exam pressure, perhaps depending on the subject and whether or not the tests are 'high stakes'?

Ghazala Azmat and colleagues consider evidence for secondary school age children in Spain – and its implications for the choices that young men and women make about degree subjects and careers.

Proposed changes to national exams in England mean that the exams taken at the end of GCSE and A-level courses will start to count for more and, in some cases, as much as 100% of the final grade. Arguments in favour of the reform include preventing 'cheating' by teachers when grading coursework, and reducing the time spent on coursework in the classroom. But one important concern seems to have been overlooked by those proposing the reform: when the final grades depend on the results achieved in a few tests, the pressure associated with those tests increases.

Even though the pressure will increase equally for all pupils, its effects may not be homogeneous across all groups. While more pressure might enhance the academic performance of some pupils, the reverse might be the case for others. Research in psychology has shown that increased pressure is potentially harmful to people's capacity to exhibit their 'true' capability. The effects of a change in exam pressure might be especially important for certain types of pupils – girls versus boys, perhaps, or low-versus high-performing pupils.

Our research explores differences in girls' and boys' responses to changes in exam pressure in Spain. We do this using detailed information over a period of 12 years on several cohorts of pupils who take four different types of tests, including national exams, with varying stakes.

We find that girls and boys do react differently to increases in exam pressure, as defined by the size of the stakes at hand. In particular, girls do relatively better on tests with low stakes, but this difference is reduced and even disappears when the stakes increase. Over the course of the academic year, pupils in our sample take a number of tests, some of which count for as little as 2.5% of the final grade and others that count for as much as 27%.

We also have information on the national exams they take, which count for 50% of the university entry grade.

Gender differences in academic attainment and achievement have been widely documented by researchers in the economics of education. For example, in university attainment, the gender gap has closed and, in many countries, it has even reversed to the extent that more women graduate than men. Among 18 year olds in the UK in 2015, 25.1% of men and 34% of women took university places.

But in educational attainment – at both school and university – economists are puzzled by the patterns. Girls tend to outperform boys in classroom tests taken in school or university, but in aptitude and achievement exams, the advantage disappears and often reverses. An important distinguishing feature of these different types of assessment is the extent of their stakes: exams typically count most for progression and the likelihood of a young person going into further education or getting a job.

In our study, we follow pupils from the age of 12 to 18 years old. In each of their six academic years, the pupils take bi-monthly, end-of-term and end-of-year tests, which we define respectively as low, medium and high stakes. When they are in their final year of school, in addition to the usual tests, they take national exams. The university entry grade is determined half by the coursework grades in school in the final year and half by the national exams (which makes them even higher in stakes than other tests).

We find that in all academic years, girls perform significantly better than boys in classroom tests, but in the national exams, boys perform slightly better than girls. Breaking down the classroom tests into low, medium and

Girls seem to perform best where there is less at stake: classroom tests rather than national exams

high stakes, girls seem to perform best in the tests that have low stakes: on average, they perform almost twice as well in the low stakes tests compared with the high stakes tests.

Looking across different subjects, we see that the gender difference in performance in the low versus high stakes tests is always present. But it is especially important in maths and science – subjects that traditionally have few women studying them beyond compulsory education.

Our results suggest that changing assessment methods homogeneously across all pupils, as proposed in England, may change the gender balance of academic results. These effects may be exacerbated once pupils are given a choice about which subjects or degrees they want to pursue. Until a certain age, all pupils are obliged to take a certain set of courses but after that they can choose. These choices are likely to be influenced by previous performance, as well as the anticipated pressure.

This is important not only for educational outcomes but for the labour market too. Looking at degree programmes or across occupations, there is still a great deal of sorting by gender. Men and women tend to self-select into certain courses and jobs, which can have significant consequences for wages and provides an important explanation for the continued existence of big gender wage gaps.

In a recent article in the *Washington Post*, economist Peter Arcidiacono of Duke University is quoted highlighting the issue of gender differences in degree subjects that are traditionally predictive of high salaries later in life: ‘STEM [science, technology, engineering and medicine] majors, as with economics, begin with few women enrolling and end with even fewer graduating. This *leaky pipeline* has been somewhat puzzling, because women enter college just as prepared as men in math and science.’

Harvard economist Claudia Goldin finds a similar puzzle in bachelor’s degrees in economics in the United States. Women who receive an A in introductory economics are more likely to major in economics than men with an A. But when women receive a lower grade, they are less likely to choose economics. Men who receive a B are as likely to major in

economics as men with an A, while women with a B are half as likely to major in economics as women with an A.

One possible explanation for this puzzle is that some degrees (and some jobs) entail more pressure than others. Young people with a low tolerance for pressure will avoid degrees or firms that reward tolerance for pressure. It might also be that pressure in the selection process leads to candidates with low tolerance for pressure opting out.

This article summarises ‘Gender Differences in Response to Big Stakes’ by Ghazala Azmat, Caterina Calsamiglia and Nagore Iriberry, CEP Discussion Paper No. 1314 (<http://cep.lse.ac.uk/pubs/download/dp1314.pdf>) and forthcoming in the *Journal of the European Economic Association*.

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Changing how achievement is assessed at school may affect the gender balance of results