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Gendered choices of STEM subjects for matriculation are not driven by prior differences in mathematical achievement

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Highlights

- â€¢ Gender streaming among STEM fields appears already in secondary school.
- â€¢ Girls are under-represented in physics, IT and advanced mathematics.
- â€¢ This pattern is not driven by gender differences in prior achievement in numeracy.
- â€¢ Socio-economic disadvantage has a greater adverse effect on boys than on girls.

There is significantly less gender streaming among STEM fields in all-girl schools.

Abstract

Women's under-representation in high-paying jobs in STEM fields (science, technology, engineering and mathematics) mirrors their earlier choices of matriculation electives: male students favour physics, information technology and advanced mathematics; female students favour life sciences. "Pipeline" theories attribute these patterns to a male advantage in mathematics, but our longitudinal analysis, using administrative data on a full cohort of students in Victoria, Australia, shows that these patterns remain intact after conditioning on prior achievement. Female students require stronger prior signals of mathematical ability to choose male-dominated subjects, and when choosing these subjects earn higher average scores than males, suggesting a possible loss of efficiency. Previous research has shown that socio-economic disadvantage adversely affects boys more than girls, and indeed we find less of a male advantage in physics and advanced mathematics among socially disadvantaged students. We find that students with a language background other than English choose STEM fields with greater frequency than other students, reflecting their comparative advantage, while exhibiting more markedly gendered subject choices, indicating a role for cultural factors. Finally, we find significantly less gender streaming in STEM subjects among female students in all-girl schools than in co-educational schools, but no such difference for male students.



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