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Gender and STEM Subject Choice

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Science, Technology, Engineering and Mathematics' (STEM) knowledge and skills are of increasing importance to the Scottish (and UK) economy in terms of economic growth and better-paid employment opportunities. Shortages of suitably qualified individuals mean that policymakers are concerned to increase the study of STEM subjects at both tertiary and secondary education levels, as the latter feeds the former. Persistent, gendered patterns of STEM subject choice exist at all school qualification levels with, for instance, Biology more likely to be studied by females and Physics by males. These differences have been attributed to social conditioning and gender-biased environments rather than any innate, biological differences with little known about the latter. This paper used Scottish Qualifications Authority (SQA) administrative data for 2002-2009, linked to the Scottish Index of Multiple Deprivation (SIMD), to explore whether biological factors may play a part in STEM subject choice in Scottish state secondary schools. Specifically, it examined the impact that potential exposure to increased levels of testosterone, in-utero, for female twins with male co-twins (the Twin Testosterone Transfer hypothesis) may have on their STEM subject choices. Twins and a control group of closely spaced sibling pairs were identified from SQA administrative data. Logistic regression was employed to examine Maths, Biology, Chemistry, Physics, general Science and Computing subject choices. No evidence of any testosterone effect was found despite clear patterns of gender segregation. The impact of socio-economic background was stark. The odds of individuals from more disadvantaged backgrounds taking named sciences fell as deprivation levels rose. Age-14 educational choices and general age-16 attainment were seen to be critical for studying STEM subjects at Higher, the crucial qualifications for university entry, indicating that policy interventions to increase uptake need to begin well before this to redress social inclusion and gender imbalance issues.

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