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COMMENTARY

The High School Environment and the Gender Gap in Science and Engineering

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Despite the striking reversal of the gender gap in educational attainment and the near gender parity in math performance, women still pursue science, technology, engineering, and mathematics (STEM) degrees at much lower rates than those of their male peers. Existing explanations of this persisting pattern of gender differences focus on mathematical abilities, beliefs related to gendered expectations about appropriate jobs, considerations about work-family balance, and self-assessment of career-relevant tasks. Our research extends this work and focuses on the role of the high school context for the gender gap in STEM fields. Are the high school years an important period in which students develop an interest in a STEM career? If so, could high school interventions be effective in attracting students to these fields and in closing the gender gap?

We address these questions in two related studies: "Pathways to Science and Engineering Bachelor's Degrees for Men and Women" (*Sociological Science* Study I) and "The High School Environment and the Gender Gap in Science and Engineering" (*Sociology of Education* Study II). Using data from the National Education Longitudinal Study (NELS), we track students' orientation towards STEM fields from middle school to high school to college across schools in the United States. Our findings confirm previous research that highlights the importance of early encouragement for gender differences in STEM degrees, but our findings also attest to the high school years as a decisive period for the gender gap, while challenging the focus on college in research and policy. Indeed, if female high school seniors had the same orientation toward and preparation for STEM fields as their male peers, the gender gap in STEM degrees would be closed by as much as 82 percent.

Our findings further show large variations between high schools in the ability to attract students to STEM fields conditional on their pre-high school interest in STEM fields. Schools that are successful in attracting students to these fields reduce the gender gap by 25 percent or more. As a first step toward understanding what matters about schools, we then determine that a high school's curriculum in STEM and gender segregation of extracurricular activities are two concrete and amenable high school characteristics that influence the gender gap.

From a policy perspective, our findings point to important directions for research about concrete interventions. Examination of variations across contexts shows that the local context in high school plays an important role for the gender gap in orientations toward STEM fields. As such, our findings not only point at the life course period that should be targeted by policy interventions but also provide evidence that high school interventions might be effective. In light of recent research asserting only a temporary effect from exposure to Head Start programs or to individual above-average teachers, it is of considerable importance that the effects of the high school environment on the formation of STEM orientations appear to be durable. Some existing interventions have indeed targeted high school students and shown success in promoting a STEM orientation among girls.

While such policy interventions have to withstand the serious scrutiny of experimental field trials, out findings should encourage

researchers and policymakers alike to take seriously the potential impact of high school interventions on girls' STEM orientations. Our discovery that more intense math and science curricula and less gender segregation in extracurriculars reduce the gender gap in science orientation strongly supports this conclusion.

The full studies can be found in Legewie, Joscha, and Thomas A. DiPrete. 2014. "Pathways to Science and Engineering Bachelor's Degrees for Men and Women," Sociological Science 1:41–48 (ungated); and Legewie, Joscha, and Thomas A. DiPrete. 2014. "The High School Environment and the Gender Gap in Science and Engineering," Sociology of Education.

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