

GIRLS CODE IT BETTER

Preliminary results of the research by professors Michela Carlana (Harvard University and LEAP- Bocconi University) and Margherita Fort (University of Bologna) involving students who participated to the project in the school year 2018-19

Several explanations have been proposed to justify these gender inequalities: the widespread presence of gender stereotypes, reduced awareness and confidence in one's abilities, the lack of knowledge of the benefits that can be gained from the continuation of the training course in scientific fields, the role of family and teachers in directing towards particular paths. The persistence in the choice of areas of study between high school and university suggests that it is important to intervene limiting barriers that prevent choosing the preferred field, already when attending junior high school.

The Girls Code It Better (GCIB) project (formerly run by **MAW Men At Work's** and currently by **Fondazione Officina Futuro**) targets junior high school girls and aims at reducing gender disparities in STEM fields by facilitating the discovery of tools and knowledge in the technical area, creating opportunities to exercise critical thinking to solve practical problems by promoting teamwork.

Can promoting these key skills for the labour market among girls get more girls interested in science training courses by reducing the barriers that prevent access to STEM fields?

Girls Code It Better has activated a collaboration with **Michela Carlana** (Harvard University and LEAP- Bocconi University) and **Margherita Fort** (University of Bologna, IRVAPP, CESifo, IZA) to answer this question, by assessing the impact of the program on choices, orientations and perception of barriers towards specific training and career paths of the girls directly involved, but also on the diffusion of gender stereotypes among their schoolmates.

The data were collected from a **sample of approximately 4,500 students in 16 of the 37 grade secondary schools participating in the project in the 2018-19 year**: among these, 348 students had applied for the first time to participate in GCIB in autumn 2018 out of which 257 were randomly selected to participate in the clubs and 91 were excluded (control group).¹

Fifty-four percent of girls surveyed said their gender was a barrier to pursuing the desired training path, with a peak of 66% for girls who applied to GCIB and therefore with a greater interest in STEM subjects; among boys, the fraction of those with this opinion drops to 41%. Preliminary research results suggest that perceptions of these barriers can be reduced by about 15 percentage points - an amount that roughly corresponds to the difference observed between male and female students.

In the sample, 77% of boys say they like math, compared to 67% of girls who did not apply

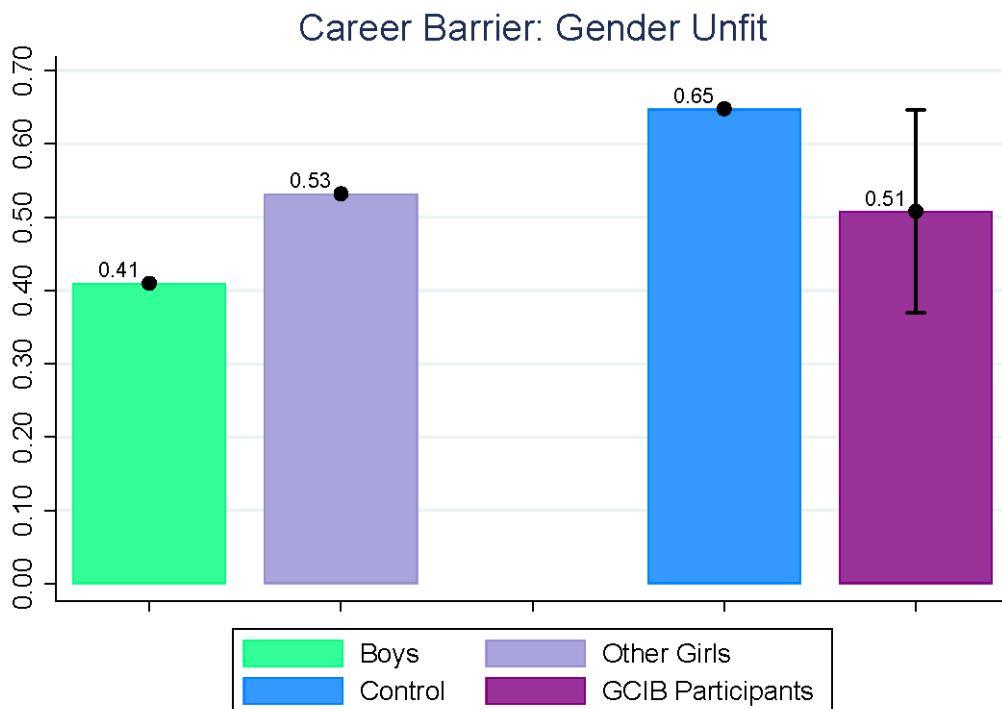
¹ Random assignment guarantees the possibility to credibly assess the GCIB program effect and was a fair way to solve rationing of the available slots to participate to the program. Of the 257 girls who completed the questionnaire and were initially selected to participate in the project, 21 did not actually participate until the end of the school year. Of the 91 girls who completed the questionnaire and were initially selected not to participate in the project, 5 participated anyway. The data used for causal assessment of the project effect refers to the initial random assignment to the control group and the treatment group (participating to the GCIB project).

to GCIB (the percentages become 81% and 75% in the case of technology): participating in the **GCIB program increases this fraction by 12 percentage points for mathematics (an increase of 17% compared to the control group) and 7 for technology (an increase of 10% compared to the control group)**. Again, the effect of participation in GCIB compensates for the observed differences between male and female students.

Participating in the GCIB program increases the interest to become a programmer by about 10 percentage points. This profession represents an attractive perspective for many students (47% of the sample) but with strong gender disparities (58% among boys, 34% among girls who had not applied to GCIB).

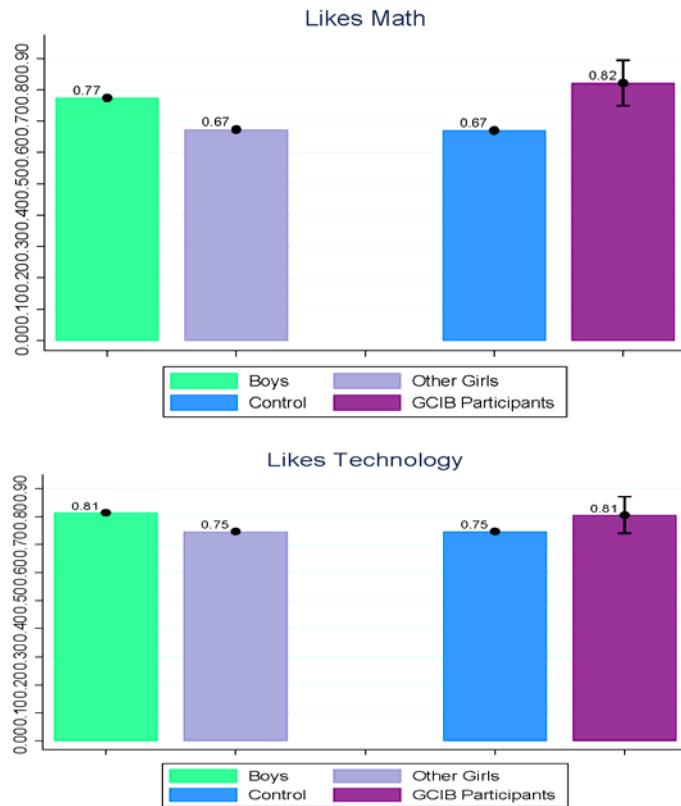
The effect on aspirations and perceptions of barriers linked to gender stereotypes indicates that the GCIB project can have a substantial impact in influencing the education and employment choices of the girls involved. A first step in the right direction to have more women in STEM.

FIGURE 1
Gender Barriers in School Path Choice



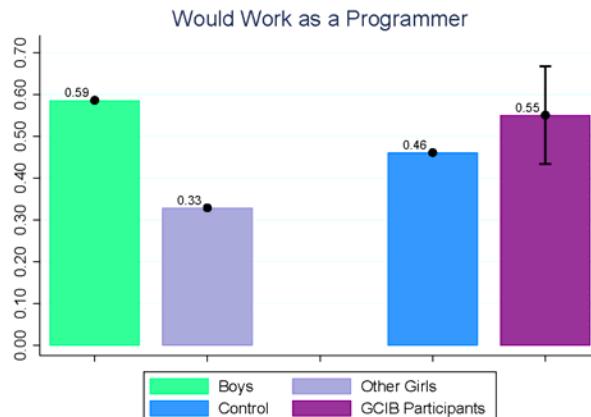
The data contains students' responses to the question: "Do you think the idea that a school course is not suitable for your gender can hinder the achievement of your educational goals?" If students have reported "Enough" "Very" or "Very much", the answer is coded with a value of 1. If they reported "Not at all" or "Little", the answer is coded as 0

FIGURE 2
Interest in Mathematics and Technology



The data shows students' responses to the question, "How much do you like these subjects?" If students have reported a "Enough" "Very" or "Very" interest in the subject, the answer is coded with a value of 1. If the reported entireis "Not at all" or "Little", the answer is coded as 0.

FIGURE 3
Interest in the profession of programmer



Note: The data shows students' responses to the question: Would you like to be a computer programmer/computer programmer when you're an adult? If students have reported "Enough" "Very" or "Very much", the answer is coded with a value of 1. If they reported "Not at all" or "Little", the answer is coded as 0.