



Thinking about Parents: Gender and Field of Study

Citation

Carlana, Michela, and Lucia Corno. "Thinking about Parents: Gender and Field of Study."
HKS Faculty Research Working Paper Series RWP24-006, March 2024.

Published version

<https://doi.org/10.2139/ssrn.4749346>

Link

<https://nrs.harvard.edu/URN-3:HUL.INSTREPOS:37377835>

Terms of use

This article was downloaded from Harvard University's DASH repository, and is made available under the terms and conditions applicable to Open Access Policy Articles (OAP), as set forth at

<https://harvardwiki.atlassian.net/wiki/external/NGY5NDE4ZjgzNTc5NDQzMGIzZWZhMGFIOWI2M2EwYTg>

Accessibility

<https://accessibility.huit.harvard.edu/digital-accessibility-policy>

Share Your Story

The Harvard community has made this article openly available.
Please share how this access benefits you. [Submit a story](#)



HARVARD Kennedy School
JOHN F. KENNEDY SCHOOL OF GOVERNMENT

Thinking about Parents: Gender and Field of Study

Faculty Research Working Paper Series

Michela Carlana
Harvard Kennedy School

Lucia Corno
Cattolica University

March 2024
RWP23-006

Visit the **HKS Faculty Research Working Paper Series** at: <https://ken.sc/faculty-research-working-paper-series>

The views expressed in the **HKS Faculty Research Working Paper Series** are those of the author(s) and do not necessarily reflect those of the John F. Kennedy School of Government or of Harvard University. Faculty Research Working Papers have not undergone formal review and approval. Such papers are included in this series to elicit feedback and to encourage debate on important public policy challenges. Copyright belongs to the author(s). Papers may be downloaded for personal use only.

Thinking about Parents: Gender and Field of Study *

Michela Carlana,[†] Lucia Corno[‡]

May 2024

Abstract

Globally, women remain underrepresented in STEM. Our lab-in-the-field study delves into parental influence on adolescents' perceptions of scientific versus humanistic aptitude. We find that thinking about parental recommendation affects students' beliefs on their comparative advantage in a gender-stereotypical way. Girls are 23% less likely to choose math when they think about their mothers' recommendation before selecting their field. The paper underscores the critical role parents play in shaping gender-specific beliefs about academic strengths, highlighting potential avenues for fostering diversity in STEM.

Keywords: gender stereotypes, parents, math, literature

*We are grateful to the schools that took part in the survey and the intervention for their collaboration, to Action Aid and CIAI, and to our team of enumerators (Francesca Bramucci, Silvia Farina, Beatrice Ferrario, Agnese Gatti, Matteo Giugovaz, Maddalena Grignani, Pietro Guglielmi, Maurizio Malpede, Sara Pratico, Gian Matteo Ricci, and Gianluca Strada) for invaluable help with data collection. Isabela Duarte, Jack Melbourne, Ludovica Mosillo, Elisa Muscarella, and Martina Rovetto provided excellent research assistance. We are also grateful to Gianna Barbieri and Annarita Marzullo from the Italian Ministry of Education for providing the data used in this paper. Financial support from “Con i Bambini Impresa Sociale” is greatly acknowledged. AER RCT Registry ID: AEARCTR-0004900. The project has been approved by the Ethics Committee of Bocconi University (Prot n. 7098-2 07/03/2019) and Harvard University (IRB19-1630).

[†]Harvard Kennedy School, 79 John F. Kennedy St, Cambridge MA USA, NBER, IZA, LEAP and CEPR (michela.carlana@hks.harvard.edu).

[‡]Cattolica University, LEAP, CEPR, and IFS (lucia.corno@unicatt.it.).

Educational choices are still highly segregated by gender in most countries around the world (Altonji et al., 2012; Blau and Kahn, 2017), with women persistently underrepresented in highly remunerated fields, such as science, technology, engineering, and mathematics (STEM), and men underrepresented in areas such as the humanities, education, and health (Delfino, 2019). Skills, comparative advantage, and self-confidence in different fields are important predictors of educational choices (Breda and Napp, 2019; Carlana, 2019). Notably, parents play a crucial role in shaping their children's confidence, beliefs in their own abilities, and behavior through explicit or implicit recommendations. They transmit cultural traits, investments, and serve as role models (Giustinelli, 2016; Doepke and Zilibotti, 2017; Dizon-Ross, 2019; Attanasio et al., 2022). This implies that if parents hold gender-stereotypical views, they may cause beliefs' distortion on the perceived ability of children, perpetuating gender segregation in the field of study (Bordalo et al., 2019; Coffman, 2014).

In this paper, we implement a lab-in-field experiment among approximately 2000 children enrolled in 14 middle schools in Italy to investigate whether thinking about parental recommendation affects students' choice of the field of study, exacerbating gender segregation with more girls into humanistic fields and more boys into scientific fields. First, we show that children perceive gender-stereotypical recommendations from their parents: keeping constant ability, girls feel less supported in math and boys less supported in literature. Second, we show that thinking about mothers' recommendations exacerbates the gender gap in the choice of the field: it decreases the probability that girls choose math compared to literature by 10 percentage points but does not influence the choice of boys. Thinking about fathers' recommendations negatively influences the probability to choose math for girls and positively for boys, but the impact is not statistically significant at conventional level. Consistent with the literature, we find that mothers have a stronger influence on their daughters' schooling decisions and fathers have a stronger influence on their sons' decisions with gender-stereotypical recommendations (Attanasio and Kaufmann, 2014). Our results highlight the crucial role of parents in shaping children's choices and self-confidence in different fields: recommendations of parents induce equally able children to segregate into different fields, pushing more girls into humanities and more boys into sciences, thus exacerbating gender stereotypes in the field of study.

This paper contributes to the literature on the influence of parents on children's preferences and decisions (Doepke et al., 2019; Lizzeri and Siniscalchi, 2008; Giustinelli, 2016; Bergman, 2015). Parents may directly or indirectly influence children's choices and induce them to behave in a direction congruent with their transmission effort (Bisin and Verdier, 2011). Among the studies able to empirically identify the role of parents

on the field of study, [Dahl et al. \(2020\)](#) find that if the father or the mother graduates in a certain field, their son is more likely to follow their track, while these effects are muted for daughters. Another recent paper by [Tungodden \(2022\)](#) studies the effect of parents in shaping their children’s willingness to compete, showing that parents choose more competition for boys than for girls. Finally, [Cheng et al. \(2017\)](#) test the extent to which the mindsets of a student’s parents regarding math ability influence their own mindset on math ability and longer-term STEM-related outcomes. Different from these studies, we design a lab-in-the-field experiment to investigate the causal effect of parental influence on students’ perceived comparative advantage in different fields and disentangle whether the effect is driven by the activation of mothers’ or fathers’ perceived recommendation or by parents’ observability of students’ choices.

1 Experimental Design

In the fall of 2019, we collected data among students enrolled in grade 6 to 8 in 14 middle schools in Italy, prior to them selecting their high school field of study. To mimic gender-segregated track choices within the experiment, we incentivize students to choose the task they think they are better at between a male-stereotypical field (math) and a female-stereotypical field (literature) ([Coffman, 2014](#)). Before choosing, students were randomly exposed to different treatments, described below, and a control group:

- *Treatment 1: Mothers’ Recommendation.* We asked students to think about whether their mother would recommend them to math or literature before they made their own choice.
- *Treatment 2: Fathers’ Recommendation.* We asked students to think about whether their father would recommend them to choose math or literature before they made their own choice.
- *Treatment 3: Disclosure to Parents.* We told students that their choice may be revealed to their parents.

The randomization process of students across treatment arms was designed as part of the survey implemented by a team of enumerators using tablets in schools. Appendix Table I shows that the characteristics of students are balanced across treatment groups. More details on the sample and experimental design are available in [Carlana and Corno \(2024\)](#).¹

¹The original experimental design includes two additional arms: i) in one group, we told students that their choice of the task will be revealed to their peers; ii) in another group, we told that their choice

2 Descriptive Evidence on Perceived Recommendations

We start by examining whether students perceive a gender-stereotypical recommendation from their parents. Appendix Figure 2 plots the raw data of students' beliefs on their mothers' advice (left panel) and their fathers' advice (right panel) by gender. When thinking about mothers' recommendation, 44% of girls and 50% of boys believe math would be recommended to them. When thinking about fathers' advice, 62% of girls and 67% of boys believe math would be recommended to them. Students believe that mothers are, on average, more likely to recommend literature than fathers, but overall the gender gap in students' beliefs is similar for both parents (around 6 percentage points).

As shown in Appendix Table II, the gender gap in perceived recommendations for math is only marginally affected when controlling for students' comparative advantage in math with respect to literature in the baseline grades (column 2) and for other baseline characteristics, including family background and class fixed effects (column 3). For a limited sample of students, we were able to collect the actual parental recommendation through a questionnaire to their mothers and fathers. Restricting the analysis to this sample, we find that the perception of students is highly correlated with the actual parental recommendation of both mothers and fathers, even when controlling for the comparative advantage in the subject and other students' controls (columns 5 and 6).

These gender-stereotypical associations may reduce girls' perceived comparative advantage in math and boys' perceived comparative advantage in literature compared to what they would have done without thinking about their parents' recommendations, potentially leading to a mismatch of talents. If this were the case, we would expect the effect of our experimental treatments to depend on parental recommendation toward scientific or humanistic fields.

3 Main results

The main results of our experiment are presented in Figure 1. In the control group, 47% of girls and 59% of boys believe they have a comparative advantage in math compared to literature, reflecting a substantial gender-stereotypical gap that cannot be explained by observed ability as we discussed in the section above. Our experimental results suggest that simply thinking about mothers' recommendation (Treatment 1: Mothers'

will be revealed to their peers and that they need to interact in the task's correction with peers who have made their same choice. The focus of this paper is to examine parents' influence and we thus restrict the sample to students in Treatments 1-3.

Recommendation) exacerbates the gender gaps: it decreases the probability that girls choose math by around 10 percentage points, a decrease of 21% compared to the control group, while it does not affect the perceived comparative advantage of boys in math with respect to literature. Overall, we do not find a statistically significant effect on either genders from thinking about their fathers' recommendation (Treatment 2: Fathers' Recommendation). Appendix Table III shows that results are quantitatively unaffected by the specification chosen.

To further understand whether students' perceived comparative advantage is affected by the activation of parental recommendation or by the fear of disappointing parents with their choice, we include a third treatment arm with explicit information to students that their choice may be revealed to their parents (Treatment 3: Disclosure to Parents). When exposed to this information, girls decrease their probability of choosing math by around 7 percentage points, and boys increase their probability of choosing math by 3 percentage points: the effects are qualitatively smaller than Treatment 1 and are not statistically significant at conventional levels.

The results for Treatment 3 suggest that the revelation of students' choices to parents is not sufficient to lead to a change in students' perceived comparative advantage: families may openly discuss preferences and perceived ability (even if with biased information on actual ability driven by stereotypes), and therefore students may not be concerned by the disclosure of information to parents (Giustinelli, 2016; Dizon-Ross, 2019). However, parents, in their interaction with children, help them build their self-confidence in different domains. Thinking about one's mother's and father's recommendations (as in Treatment 1 and 2) may directly influence the perception of one's comparative advantage as it potentially activates a gender-stereotypical recommendation.

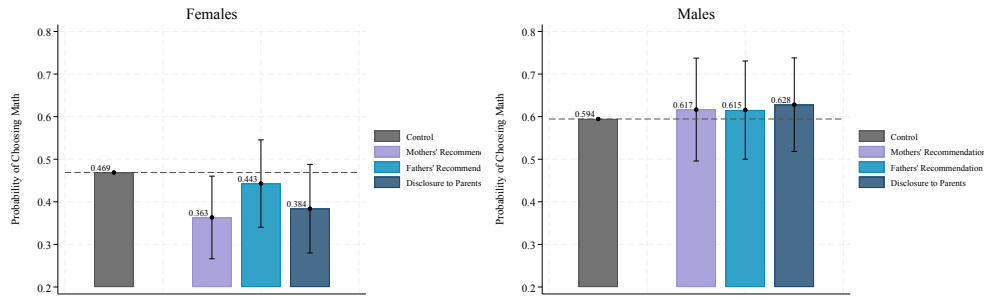


Figure 1. Treatment Effect

Notes: This figure shows the mean of the probability of choosing math for students in the control group, treatment group 1 (Mothers' Recommendation), treatment group 2 (Fathers' Recommendation), and treatment group 3 (Disclosure to Parents). The coefficients are obtained from a regression including class fixed effects and all baseline controls. We also report the 95% confidence intervals for each estimate.

4 Mechanisms

To investigate whether the parental recommendation is the mechanism driving the results, we analyze the heterogeneous treatment effects depending on students' perceived recommendation from mothers and fathers. As shown in Appendix Figure 3, in the control group 58% (78%) of girls (boys) decide to choose math when they believe this would be consistent with their mother's recommendation, while this share is only 39% (43%) among those who believe their mother would recommend them literature. This mean difference in the control group partly reflects actual differences in performance or knowledge of one's own comparative advantage.

When looking at the effect of Treatment 1 (Mothers' Recommendation), we find that students who think about their mother's recommendation before choosing the field react by aligning their choice with their mother's. However, the effect is economically and statistically significant only for girls when they perceive a push toward the gender-stereotypical subject: literature. Among girls who perceive their mother would recommend literature, the probability of choosing math decreases by 53% (from 39% to 18%; Figure 3, top right panel).

Interestingly, as shown in Figure 4, we find a symmetric pattern for boys. The point estimate suggests an alignment of students' choices to fathers' perceived recommendation, statistically significant at 5% level only for boys who expect a gender-stereotypical recommendation from their fathers. Indeed, when boys believe their father would recommend math, they increase their probability of choosing math by 15% (from 72% to 83%) if they are induced to think about their father's recommendation before choosing

the subject. Appendix Table IV (Panels A and B) reports the coefficients plotted in Figures 3 and 4, correcting for multiple hypothesis testing using the Westfall-Young step-down-adjusted p -values, which also control for the FWER and allow for dependence among the p -values. The results are neither qualitatively nor quantitatively different from the main specification.

Even when parents do not directly impose their choices on children, the results show that they can indirectly influence their children’s perceived comparative advantage, leading to an exacerbation of gender stereotypes in the choice of field. If students perceive counter-stereotypical recommendations from parents, they are not influenced in their decision of math versus literature. However, gender-stereotypical recommendations of same-gender parents induce children to segregate in different fields, pushing more girls into literature and more boys into math. This may activate stereotypes associating gender and field of study that are deeply rooted in exposure since early childhood (Ambady et al., 2001; Banse et al., 2010).

5 Conclusion

The results from our experiment suggest that parents of the same gender as their child have an impact on their children’s choices of the field in a gender stereotypical way (i.e., fathers influence boys in choosing more math, and mothers influence girls in choosing more literature): conditional on ability, girls are 33% more likely to think they are better in literature when they expect their mothers recommending it, and boys are 15% more likely to believe they are better in math when they expect their fathers to recommend it. The effect is driven by the activation of parental recommendation inducing children to think about the stereotypical choice and not necessarily from the fear of disappointing parents with their choice. Interventions aimed at raising awareness among parents regarding the impact of gender stereotypes on their children’s choices may be instrumental in mitigating gender disparities.

References

- Altonji, J. G., Blom, E., and Meghir, C. (2012). Heterogeneity in Human Capital Investments: High School Curriculum, College Major, and Careers. *Annual Review of Economics*, 4(1):185–223.
- Ambady, N., Shih, M., Kim, A., and Pittinsky, T. L. (2001). Stereotype susceptibility in children: Effects of identity activation on quantitative performance. *Psychological science*, 12(5):385–390.
- Attanasio, O., Boneva, T., and Rauh, C. (2022). Parental beliefs about returns to different types of investments in school children. *Journal of Human Resources*, 57(6):1789–1825.
- Attanasio, O. and Kaufmann, K. (2014). Education choices and returns to schooling: Intrahousehold decision making, gender and subjective expectations. *Journal of Development Economics*, 109:203–216.
- Banse, R., Gawronski, B., Rebetez, C., Gutt, H., and Bruce Morton, J. (2010). The development of spontaneous gender stereotyping in childhood: Relations to stereotype knowledge and stereotype flexibility. *Developmental Science*, 13(2):298–306.
- Bergman, P. (2015). Parent-child information frictions and human capital investment: Evidence from a field experiment.
- Bisin, A. and Verdier, T. (2011). The economics of cultural transmission and socialization. In *Handbook of social economics*, volume 1, pages 339–416. Elsevier.
- Blau, F. D. and Kahn, L. M. (2017). The gender wage gap: Extent, trends, and explanations. *Journal of Economic Literature*, 55(3):789–865.
- Bordalo, P., Coffman, K., Gennaioli, N., and Shleifer, A. (2019). Beliefs about gender. *American Economic Review*, 109(3):739–73.
- Breda, T. and Napp, C. (2019). Girls’ comparative advantage in reading can largely explain the gender gap in math-related fields. *Proceedings of the National Academy of Sciences*, 116(31):15435–15440.
- Carlana, M. (2019). Implicit stereotypes: Evidence from teachers’ gender bias. *The Quarterly Journal of Economics*, 134(3):1163–1224.
- Carlana, M. and Corno, L. (2024). Peers and gender-stereotypes in the field of study. *Working Paper*.
- Cheng, A., Kopotic, K., and Zamarro, G. (2017). Can parents’ growth mindset and role modelling address stem gender gaps?
- Coffman, K. B. (2014). Evidence on self-stereotyping and the contribution of ideas. *The Quarterly Journal of Economics*, 129(4):1625–1660.

- Dahl, G. B., Rooth, D.-O., and Stenberg, A. (2020). Family Spillovers in Field of Study. NBER Working Papers 27618, National Bureau of Economic Research, Inc.
- Delfino, A. (2019). Breaking gender barriers: Bringing men into the pink-collar jobs of the future. *Working Paper*.
- Dizon-Ross, R. (2019). Parents' beliefs about their children's academic ability: Implications for educational investments. *American Economic Review*, 109(8):2728–65.
- Doepke, M., Sorrenti, G., and Zilibotti, F. (2019). The economics of parenting. *Annual Review of Economics*, 11:55–84.
- Doepke, M. and Zilibotti, F. (2017). Parenting with style: Altruism and paternalism in intergenerational preference transmission. *Econometrica*, 85(5):1331–1371.
- Giustinelli, P. (2016). Group decision making with uncertain outcomes: Unpacking child–parent choice of the high school track. *International Economic Review*, 57(2):573–602.
- Lizzeri, A. and Siniscalchi, M. (2008). Parental guidance and supervised learning. *The Quarterly Journal of Economics*, 123(3):1161–1195.
- Tungodden, J. (2022). When parents decide: Gender differences in competitiveness. *Journal of Political Economy*.

Online appendix

Table I. Balance Table

	(1) Control Control	(2) Difference Treatment 1	(3) Difference Treatment 2	(4) Difference Treatment 3
<i>Student Characteristics</i>				
Female	0.469 (0.500)	0.062 [0.106]	0.024 [0.539]	0.041 [0.265]
Immigrant	0.144 (0.352)	-0.030 [0.178]	-0.002 [0.926]	-0.007 [0.765]
Std IAT	-0.043 (1.013)	-0.036 [0.624]	0.017 [0.831]	0.045 [0.563]
Index of explicit stereotypes	-0.027 (1.007)	0.054 [0.476]	0.125 [0.100]	0.024 [0.739]
Math Grade (Pre-Experiment)	7.196 (1.493)	-0.094 [0.531]	-0.022 [0.905]	-0.155 [0.298]
Italian Grade (Pre-Experiment)	7.221 (1.101)	-0.103 [0.322]	-0.055 [0.645]	-0.116 [0.191]
<i>Family Characteristics</i>				
Education level of mum: primary or junior sec.	0.193 (0.395)	-0.020 [0.512]	0.028 [0.269]	0.010 [0.732]
Education level of mum: high school	0.393 (0.489)	0.002 [0.969]	-0.031 [0.422]	-0.012 [0.751]
Education level of mum: university	0.201 (0.401)	-0.042 [0.156]	-0.044 [0.152]	0.000 [0.997]
Education level of dad: primary or junior sec.	0.203 (0.403)	0.021 [0.509]	0.016 [0.569]	0.014 [0.667]
Education level of dad: high school	0.398 (0.490)	-0.024 [0.494]	0.013 [0.693]	0.001 [0.985]
Education level of dad: university	0.168 (0.374)	-0.060 [0.026]	-0.040 [0.174]	-0.055 [0.060]
Lives with both parents	0.835 (0.372)	-0.005 [0.845]	0.015 [0.582]	0.002 [0.949]
Mother works	0.686 (0.465)	-0.015 [0.688]	0.080 [0.022]	0.041 [0.238]
Father works	0.958 (0.200)	0.004 [0.788]	-0.001 [0.934]	-0.023 [0.209]
Low wage job - mum	0.373 (0.485)	-0.005 [0.910]	0.051 [0.248]	0.027 [0.578]
Medium or high wage job - mum	0.335 (0.473)	-0.024 [0.622]	-0.010 [0.792]	0.014 [0.763]
Low wage job - dad	0.314 (0.465)	-0.021 [0.547]	0.005 [0.891]	0.045 [0.257]
Medium or high wage job - dad	0.351 (0.478)	-0.025 [0.560]	-0.028 [0.506]	-0.069 [0.092]
Number of observations	409	430	429	402

Notes: Column 1 presents the mean of the variable for the control group with respective standard deviations in parentheses. Columns 2-4 present the difference between the mean by treatment arm and the control group. Treatment 1 is Mothers' Recommendation, Treatment 2 is Fathers' Recommendation, and Treatment 3 is Disclosure to Parents. The index of explicit stereotypes is constructed using the first principal component from the following seven questions: i) there are biological differences in men's and women's innate math abilities; ii) earning money to support the family is a father's responsibility; iii) taking care of the house and children is a mother's responsibility; iv) psychologist is not a job suitable for women; v) a computer programmer is not a job suitable for women; vi) even if they work hard, women cannot be good at football; and vii) even if they work hard, men cannot be good at cooking. A low-wage job is considered as being a construction worker, salesperson, hairdresser, cook, or similar type of job for both mothers and fathers. The mother's occupation skill level is also set to one if she is living with someone employed in a job of that skill level. P-values for the two-sided test of equivalence in means are in square brackets. All columns include fixed effects for the experimental session (class), and standard errors are clustered at the same level. For brevity, the balance on the missing variable is omitted. Significance levels: *** p < 0.01, ** p < 0.05, * p < 0.1.

Table II. Students' Belief of Parental Advice

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Mother's Advice						
	Full Sample			Parents' Sample		
Dependent Variable:	= 1 if student believed the Mother would advise Math					
Girl	-0.065 (0.021)	-0.054 (0.021)	-0.059 (0.022)	-0.134 (0.057)	-0.089 (0.053)	-0.072 (0.061)
Grade in Math-Literature		0.079 (0.014)	0.077 (0.014)			0.097 (0.035)
Mother advice: Math					0.258 (0.051)	0.216 (0.056)
Mean Y: Boys	0.50	0.50	0.50	0.57	0.57	0.57
Mean Y: Girls	0.44	0.44	0.44	0.43	0.43	0.43
Obs.	2,511	2,511	2,511	409	409	409
R ²	0.004	0.018	0.045	0.018	0.082	0.175
Performance	N	Y	Y	N	Y	Y
Controls	N	N	Y	N	N	Y
Panel B: Father's Advice						
	Full Sample			Parents' Sample		
Dependent Variable:	= 1 if student believed the Father would advise Math					
Girl	-0.057 (0.022)	-0.049 (0.022)	-0.057 (0.021)	-0.053 (0.075)	-0.013 (0.073)	0.001 (0.079)
Grade in Math-Literature		0.054 (0.013)	0.050 (0.013)			0.026 (0.070)
Father advice: Math					0.308 (0.073)	0.322 (0.085)
Mean Y: Boys	0.67	0.67	0.67	0.74	0.74	0.74
Mean Y: Girls	0.62	0.62	0.62	0.69	0.69	0.69
Obs.	2,511	2,511	2,511	128	128	128
R ²	0.004	0.010	0.043	0.003	0.118	0.341
Performance	N	Y	Y	N	Y	Y
Controls	N	N	Y	N	N	Y

Notes: The dependent variable indicates whether the student believes the parents (mother in Panel A, father in Panel B) would recommend that they choose math versus literature in our lab-in-the-field experiment. Controls include baseline grades in math and literature, an indicator for the student being an immigrant, the IAT score, an indicator of explicit stereotypes, if the student lives with both parents and the presence of siblings, dummy variables indicating parents' level of education, and employment and job skill category as defined in Table I. For each variable, we include an indicator controlling for when the answer is missing. Robust standard errors, clustered at the class level, are in parentheses. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table III. Treatment Effects, by gender

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable: = 1 if student decided to study Maths	<i>Female students</i>			<i>Male students</i>		
TE 1: Mother's Recommendation	-0.071 (0.042)	-0.087 (0.051)	-0.105 (0.049)	-0.002 (0.048)	0.003 (0.058)	0.022 (0.062)
TE 2: Father's Recommendation	-0.033 (0.048)	-0.015 (0.056)	-0.026 (0.052)	0.048 (0.047)	0.008 (0.056)	0.021 (0.059)
TE 3: Disclosure to Parents	-0.064 (0.047)	-0.083 (0.056)	-0.085 (0.053)	0.045 (0.047)	0.020 (0.056)	0.034 (0.056)
Mean Y Control	0.469	0.469	0.469	0.594	0.594	0.594
Obs.	837	837	837	833	833	833
R^2	0.003	0.267	0.394	0.002	0.238	0.342
Class FE	N	Y	Y	N	Y	Y
Student controls	N	N	Y	N	N	Y
Family controls	N	N	Y	N	N	Y

Notes: The dependent variable indicates if the student chose math versus literature in our lab-in-the-field experiment. Columns 2-3 and 5-6 control for class fixed effects. Columns 3 and 6 add controls for the student: baseline grades in math and literature (for students in grades 7 and 8 of our experiment), an indicator for whether the student is an immigrant, the IAT score, and an indicator of explicit stereotypes as described in the footnote of Table I. The specification in columns 3 and 6 further adds a set of family controls that include the following: if the student lives with both parents and the presence of siblings, dummy variables indicating the parents' level of education, and employment and job skill category as described in the footnote of Table I. For each variable, we include an indicator controlling for when the answer is missing. Robust standard errors, clustered at the class level, are in parentheses. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

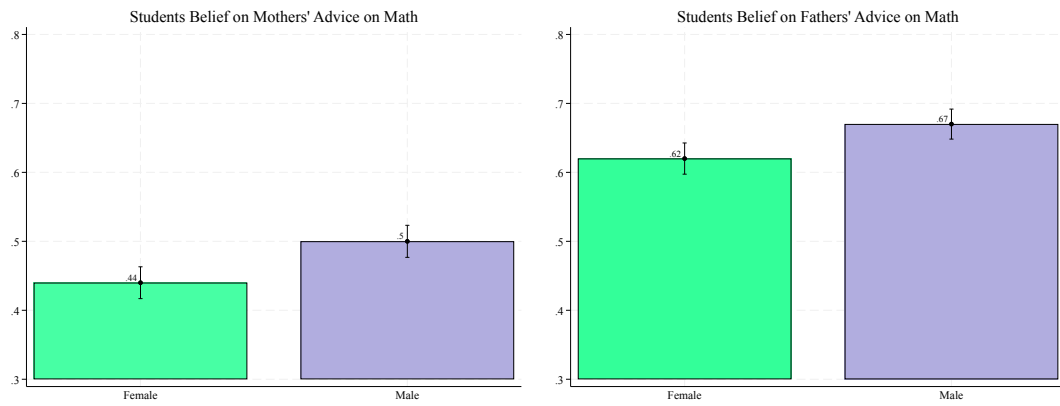
Table IV . Heterogeneous Treatment Effects by Perception of Parental Recommendation

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent Variable: = 1 if Student Chose Math					
	Female			Male		
<i>Panel A: Belief of Mother's Advice</i>						
Treatment 1 - Think of mother recommendation	-0.214 (0.054) { 0.020 }	-0.183 (0.068) { 0.154 }	-0.202 (0.068) { 0.169 }	-0.148 (0.070) { 0.033 }	-0.128 (0.083) { 0.075 }	-0.095 (0.084) { 0.169 }
Treatm. 1 $\times$ mum suggests math	0.270 (0.092) { 0.000 }	0.188 (0.115) { 0.018 }	0.189 (0.114) { 0.006 }	0.219 (0.086) { 0.041 }	0.219 (0.107) { 0.154 }	0.179 (0.106) { 0.221 }
Mother suggests math	0.193 (0.071)	0.195 (0.091)	0.166 (0.087)	0.351 (0.058)	0.336 (0.071)	0.353 (0.067)
<i>Panel B: Belief of Father's Advice</i>						
Treatment 2 - Think of father recommendation	-0.075 (0.070) { 0.407 }	-0.143 (0.079) { 0.725 }	-0.139 (0.080) { 0.902 }	0.012 (0.076) { 0.008 }	0.015 (0.086) { 0.219 }	-0.016 (0.083) { 0.261 }
Treatment 2 $\times$ dad suggests math	-0.008 (0.101) { 0.407 }	0.083 (0.120) { 0.725 }	0.059 (0.114) { 0.902 }	0.012 (0.089) { 0.407 }	0.005 (0.108) { 0.725 }	0.070 (0.098) { 0.806 }
Father suggests math	0.319 (0.067)	0.288 (0.085)	0.268 (0.083)	0.419 (0.061)	0.432 (0.073)	0.408 (0.075)
Class FE	N	Y	Y	N	Y	Y
Student controls	N	N	Y	N	N	Y
Family controls	N	N	Y	N	N	Y

Notes: Standard errors in parentheses are clustered at the class level. FWER p -values are displayed in braces underneath standard errors. Columns 2-4 and 6-8 control for class fixed effects. Columns 3-4 and 7-8 add controls for the student: baseline grades in math and literature (for students in grades 7 and 8 of our experiment), an indicator for whether the student is an immigrant, the IAT score, and an indicator of explicit stereotypes as described in the footnote of Table 1. The specification in columns 4 and 8 further adds a set of family controls that include the following: if the student lives with both parents and the presence of siblings, dummy variables indicating the parents' level of education, and employment and job skill category as described in the footnote of Table 1. For each variable, we include an indicator controlling for when the answer is missing.

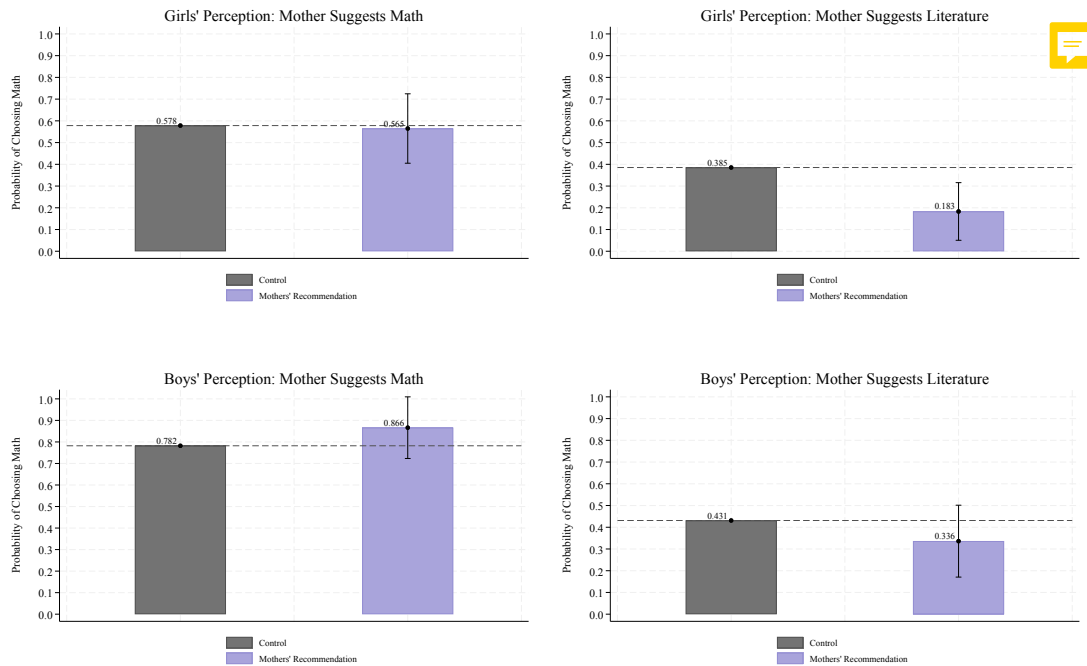
Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Figure 2. Descriptive Statistics: Students' Beliefs on Parents' Recommendation



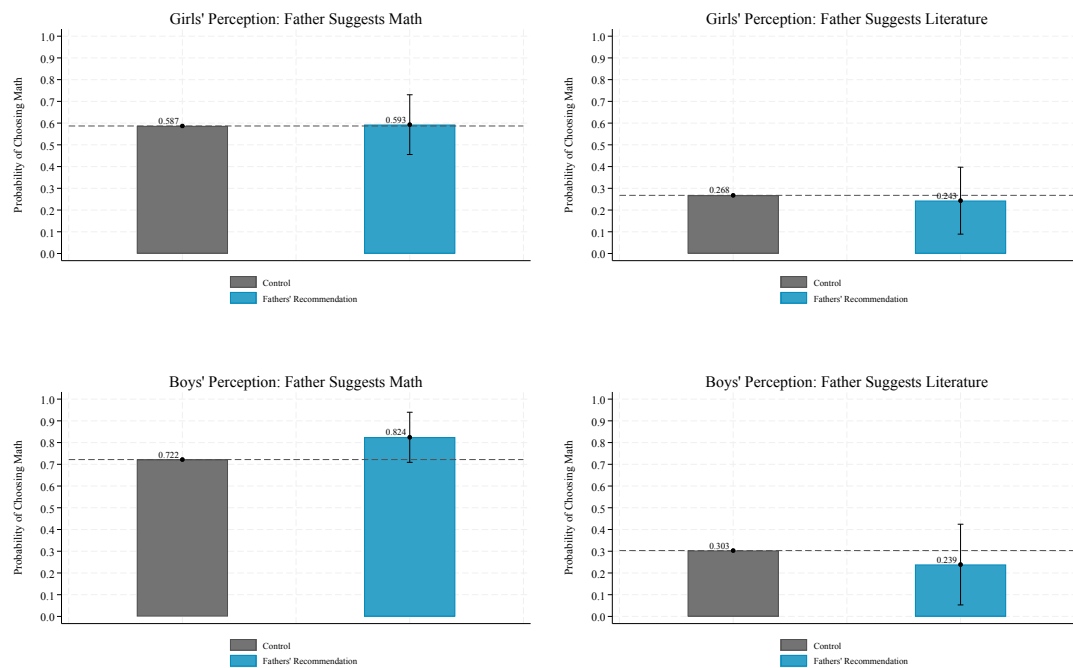
Notes: These graphs plot the belief of children on the parental recommendation. The figure on the left is about students' belief on their mothers' recommendation and the figure on the right is about students' beliefs on their fathers' recommendation. The green bar is for girls and the purple bar for boys. The full sample includes 1,670 observations from the students' questionnaire.

Figure 3. Heterogeneous Treatment Effects by Child's Perception of Mother's Suggestion



Notes: This figure shows the mean of the probability of choosing math for students in the control group, treatment group 1 (Mothers' Recommendation), and treatment group 2 (Fathers' Recommendation), divided by the child's perception of their mother's suggestion (math or literature). The coefficients are obtained from a regression including class fixed effects and all controls (as in column 4 of Table III). We also report the 95% confidence intervals for each estimate.

Figure 4. Heterogeneous Treatment Effects by Child's Perception of Father's Suggestion



Notes: This figure shows the mean of the probability of choosing math for students in the control group, treatment group 1 (Mothers' Recommendation), and treatment group 2 (Fathers' Recommendation), divided by the child's perception of their father's suggestion (math or literature). The coefficients are obtained from a regression including class fixed effects and all controls (as in column 4 of Table III). We also report the 95% confidence intervals for each estimate.