Under Pressure? Experimental Evidence of Parental and Peer Observability on Students' Occupational Aspirations

Maximilian W. Müller*, Lea Cassar†, Denise Feigl‡, Christina Felfe de Ormeno§

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Abstract

We provide causal evidence on how perceived social pressure shapes students' occupational aspirations, tracing when such influences first emerge across school years. In a randomized control trial with 2,840 secondary school students, we vary the observability of stated occupational aspirations to parents or peers. Making aspirations visible reinforces stereotypical choices, increasing the STEM gender gap by 76% under parental and by 39% under peer observability, with effects already emerging in sixth grade. Notably, beliefs about occupations shift after aspirations were elicited under parental observability, raising caution about using them as causal determinants of career choices. Our findings highlight the need for interventions addressing social dynamics early, before aspirations adapt to pressure.

*Toulouse School of Economics (maximilian.muller@tse-fr.eu

†Johannes Kepler Universität Linz (lea.cassar@jku.at)

‡Universität Regensburg (denise.feigl@wiwi.uni-regensburg.de)

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1 Introduction

Occupational choice is one of the most far-reaching decisions individuals make, shaping employment opportunities and future earnings as well as the skill composition of the broader workforce (Hsieh et al., 2019; Patnaik, Wiswall and Zafar, 2021). Yet, occupational choices are far from perfect. Career regret is a widespread phenomenon and apprenticeship termination rates are among the highest on record (Resume Now, 2024; BIBB, 2025). Large and persistent gaps in occupational sorting across gender, ethnicity, and socioeconomic background further suggest that social and structural factors constrain people's choices in ways not explained by their comparative advantage and genuine preferences (Hsieh et al., 2019; Bertrand, 2020; Chetty et al., 2020).

Despite substantial investments in initiatives aimed at improving occupational orientation and decision-making, their impact has remained limited (OECD, 2024). This is particularly well-documented for programs aimed at increasing girls' representation in STEM (McNally, 2020). A first reason may be that these programs have overlooked key determinants of educational choices. Both existing interventions and academic research have largely concentrated on internal factors, such as differences in abilities, beliefs, and tastes (Patnaik, Wiswall and Zafar, 2021), while the role of external factors, such as social pressure, has received comparatively little attention (Bertrand, 2020). This is surprising as external factors appear to play a central role in shaping occupational choice, as suggested by strong evidence for intergenerational correlation in occupational choices, in particular for same-gender parent (Altmejd, 2024; Philipp, 2023), and for students' tendency to seek parental approval when making educational decisions (Zafar, 2013; Müller, 2026) and to avoid peer penalties by conforming to prevailing norms (Bursztyn and Jensen, 2015; Bursztyn, Egorov and Jensen, 2018). A second reason may be that most existing programs target students shortly before the transition from school to the labor market, at a point when aspirations may have already largely formed. As a result, occupational choices that appear grounded in beliefs may instead reflect aspirations already adjusted to social pressure. Beliefs, in turn, may have partly developed to rationalize those socially adjusted aspirations.

Against this backdrop, we provide causal evidence on how perceived parental and peer pressure, two key sources of social influence, shape students' occupational aspirations throughout secondary school, focusing on STEM as a setting with pronounced and economically consequential demographic imbalances.[1] Specifically, we address the following questions:

[1] We use stated aspirations, which correspond to students' preferred occupational field upon completing secondary school. This differs from a literature that treats aspirations as reference points against which outcomes are evaluated, with the resulting gap shaping effort or investment decisions (Genicot and Ray, 2017).

1. How do students adjust their occupational aspirations in response to perceived parental and peer pressure and to what extent does this contribute to the gender gap in STEM?

2. Does the role of perceived pressure in shaping aspirations vary across school years, and if so, from which school grade does it first emerge?

3. How does the role of perceived pressure compare to that of the much-studied beliefs and tastes? And to what extent may beliefs themselves reflect such pressure?

To answer the outlined questions, we conducted a randomized control trial in secondary schools in Lower Franconia, Germany.[2] We focus on students' occupational aspirations within the vocational training system, a setting that accommodates more than a third of all school leavers, features particularly stark gender imbalances (only 12.2% of students in STEM vocational tracks are girls), and faces severe shortages of STEM-skilled workers, such as IT specialists, mechatronics technicians, and technical assistants (BIBB, 2025). Our sample comprises 2,840 students enrolled in grade levels six through nine (age 12-15), enabling us to compare occupational aspirations and the role of perceived parental and peer pressure across four secondary school years leading up to occupational choice.[3] These school years also coincide with the period during which professional orientation takes place, beginning gradually in sixth grade and reaching its peak in grades eight and nine, providing a natural window for interventions informed by our findings.

To capture the multidimensional nature of students' occupational decision-making, we designed a survey eliciting their occupational aspirations, personal tastes for key job attributes, and beliefs about how these attributes vary across different occupational fields. To causally identify the role of perceived parental and peer pressure in shaping occupational aspirations, we experimentally varied the observability of students' stated aspirations by giving all students access to a copy of their stated aspirations and randomly assigning them to one of three conditions:[4] a *parent* condition, in which students were asked to later discuss their stated aspirations with their parents; a *peer* condition, in which students were asked to later discuss their stated aspirations with 2–3 classmates of their choice; or a *private* condition, where students' stated aspirations were kept confidential and students asked to use the copy for their own reflection.[5] Following Bursztyn and Jensen (2015), Bursztyn, Egorov

[2]Our study is pre-registered in the AEA RCT Registry under AEARCTR-0011547. To keep the paper focused, we concentrate on the gender gap in occupational aspirations.

[3]Grade nine is the final compulsory school year in Germany.

[4]Randomization took place at the individual level within the survey: each student was privately shown the instructions for one of the three conditions. Potential post-survey spillovers are discussed in Section 2.

[5]Our treatment combines observability of occupational aspirations to parents or peers with an explicit prompt to discuss these aspirations with them. This design was chosen because data protection regulations

and Jensen (2018) and Müller (2026), we interpret deviations between choices made under observability and privately stated choices as evidence of perceived peer and parental pressure. Here, perceived pressure refers to concerns triggered specifically by being observed by parents or peers, while privately stated choices capture what students would choose absent social observation. We deliberately use the term *perceived* pressure to remain agnostic about whether parental and peer expectations are objectively imposed or justified. The mechanism requires only that students perceive such expectations as relevant to their choices.

Our findings are threefold. First, we document a significant and sizable impact of parental observability on students' stated occupational aspirations, reinforcing the gender gap in STEM. The share of girls aspiring to pursue STEM vocational training drops from 12.3% in the *private* condition to 8.6% in the *parent* condition, while the share of boys increases from 27.6% to 35.6%, a decline of 3.7 percentage points and a rise of 8.0 percentage points, respectively. Together, these shifts nearly double the gender gap in STEM aspirations, which widens from 15.3 percentage points in the private condition to 27.0 percentage points in the parent condition. Notably, the shifts in aspirations stated in the *parent* conditions align well with actual choices in this context: among graduates from the participating secondary schools who go on to vocational training, 33.8% of boys but only 7.1% of girls choose a STEM occupation,[6] shares strikingly close to those stated under parental observability.[7] The STEM gender gap also opens under peer observability, though to a smaller extent. The share of girls aspiring to STEM vocational training falls by 4.3 percentage points, while the effect for boys is smaller (1.7 percentage points) and statistically insignificant. Thus, peer observability increases the STEM gender gap by 6.0 percentage points (39%) relative to the private condition.

Second, these influences emerge surprisingly early. Among sixth-grade girls, parental observability reduces the share aspiring to STEM by 13.3 percentage points relative to the private condition (from 17.8% to 4.5%), while peer observability reduces it by 7.7 percentage points (10.1%). After this initial sixth-grade adjustment, neither parental nor peer observ-

prevented us from accessing parents' contact details, and we were therefore unable to share students' answers with parents directly. For readability, we refer to it simply as observability throughout the paper.

[6]These figures are drawn from a survey conducted on behalf of the MB Marcus Ramsteiner (*Ministerialbeauftragter* for Lower Franconia), covering all students completing *Realschule* in the region in the school year 2023/24.

[7]Stated aspirations are generally informative about later choices: adolescents' educational and occupational aspirations predict attainment in adulthood net of ability and family background (Sewell, Haller and Portes, 1969; Schoon and Polek, 2011; Guyon and Huillery, 2021), elicited expectations predict the major and occupation students end up in (Wiswall and Zafar, 2021; Arcidiacono et al., 2020), and about half of *Realschule* students attain occupations of status equal or close to the one they aspired to (Nießen et al., 2022). Observability does not weaken this link: Müller (2026) finds that aspirations stated under observability predict eventual choices even better than those stated in *private*.

ability significantly affects girls' STEM aspirations in any subsequent grade. Instead, girls' privately stated STEM aspirations drop sharply from seventh grade onward: while 17.8% of sixth-grade girls express STEM aspirations when asked privately, this share falls to 10.7% in seventh grade and never recovers. Social influences thus may operate primarily through an early and persistent discouragement of girls' internal STEM aspirations or institutional features such as the choice of a field of specialization early in secondary school. Among boys, social influence, driven exclusively by parental observability, acts slightly later, from seventh grade onward. In contrast to girls, this influence persists throughout secondary school, consistently pushing boys toward STEM vocational training.

Several pieces of evidence support interpreting our results as reflecting perceived pressure rather than more deliberate decision-making. First, the gender gap in students' beliefs about parental expectations (23.9 percentage points for mothers and 21.4 for fathers) exceeds the gap in privately stated aspirations (15.3), and parents' own stated expectations are more gender-stereotypical still (38.2 and 40.3). Second, the *private* condition does not elicit less deliberate responses: completion times and response consistency do not differ across conditions, and effects are, if anything, stronger among students who have thought carefully about their plans and who privately state more counter-stereotypical aspirations yet shift toward stereotypical choices under parental observability. Third, parental observability strengthens the link between comparative advantage in mathematics and STEM aspirations, but asymmetrically: boys are encouraged toward STEM regardless of their academic strengths, girls only if they clearly outperform in mathematics. Comparative advantage alone therefore cannot explain the effects.

Third, to put these findings into perspective, we provide a more comprehensive picture of the formation of occupational aspirations and also consider internal factors such as students' tastes and beliefs. Gender differences in students' tastes for job attributes are largely absent at these young ages. Gender differences in beliefs about occupations, however, contribute to the STEM gender gap to a similar extent as perceived parental pressure, and roughly twice as much as peer pressure. In particular, girls are systematically more pessimistic than boys about their performance in STEM, as well as about pecuniary and non-pecuniary aspects of STEM careers, such as earnings, enjoyment, comfort, and work-life balance. While perceived pressure is especially influential in earlier school years, belief differences gain importance over time. These later belief differences may, in turn, reflect earlier social influences that have become internalized, suggesting that the total role of external factors in driving the gender gap is potentially larger than our experimental estimates alone capture. Consistent with this interpretation, we show that students' beliefs about STEM occupations shift measurably after having been prompted to discuss their occupational aspirations with parents or peers

(even though the beliefs themselves are elicited afterwards under an explicit assurance of confidentiality) and that much of this belief shift can be accounted for by the corresponding shift in stated aspirations and interests. This result points to beliefs adjusting to align with aspirations that have themselves been shaped by perceived pressure, warranting caution when using them to explain educational and occupational choices.

Our paper contributes to the literature on the determinants of occupational choice and the resulting gender gap in STEM by providing evidence on both social influences and internal factors, and by doing so for young students heading into vocational training. McNally (2020) and Patnaik, Wiswall and Zafar (2021) survey this literature and identify several internal mechanisms: gender differences in tastes for job attributes (Zafar, 2013; Wiswall and Zafar, 2015), beliefs about the work environment and expected enjoyment across occupations (Zafar, 2013; Wiswall and Zafar, 2015; Dasgupta and Sharma, 2022), field-specific confidence (Saltiel, 2023; Dasgupta and Sharma, 2022), and competitiveness (Buser, Niederle and Oosterbeek, 2014; Buser, Peter and Wolter, 2017; Reuben, Wiswall and Zafar, 2017).

A burgeoning literature, surveyed by Bertrand (2020), emphasizes the central role of stereotypes in shaping occupational segregation and perpetuating the gender wage gap. Altmejd (2024) and Philipp (2023), for instance, document that children disproportionately follow the occupational path of their same-gender parent, and that this tendency is amplified when that parent works in a gender-congruent field. Examining the underlying mechanisms, Wolter and Zöllner (2025) show that parents advise gender-congruent occupations for their (hypothetical) children, while Brenoe and Rutnam (2025) find that adolescents raise aspirations for gender-congruent occupations when parental views on occupational fit are made salient. Baumeister et al. (2026) suggest that students' adjustments toward parental expectations are unlikely to stem from explicit advice, since in their study students move away from parents' advice once it is made explicit. Closest to our study in terms of design, Carlana and Corno (2021) conduct a lab-in-the-field experiment in which secondary-school students choose between math and literature tasks and show that when prompted to consider their parents' recommendations, students opt for gender-stereotypical tasks.

By bringing these two strands of literature together, our paper makes several contributions. First, we directly identify the effect of social observability on students' stated occupational aspirations, rather than relying on indirect evidence. We do so for the two central sources of social influence, parents and peers, and directly for the aspiration of interest rather than for low-stakes tasks. Second, we study a population that the literature on the STEM gender gap, with its focus on college majors, has largely overlooked: 12-to-15-year-olds heading into the vocational training system, which accommodates more than a third of all school leavers in Germany. Examining students throughout secondary school lets us

pinpoint when social influence first acts and how the drivers of the gender gap change as students approach consequential decisions, speaking more broadly to how gender identities form and social norms may become internalized.

Finally, our study speaks to the literature that uses subjective beliefs to explain educational and occupational choices (Zafar, 2013; Wiswall and Zafar, 2015; Patnaik, Wiswall and Zafar, 2021; Dasgupta and Sharma, 2022), among others by benchmarking beliefs against experimentally identified social pressure. More fundamentally, our results suggest that beliefs are not necessarily primitives that form independently of the social environment, but may partly adjust to aspirations that social forces have already shaped. Previous work has stressed that beliefs are endogenous to tastes (Patnaik, Wiswall and Zafar, 2021). We point to a distinct source of endogeneity, one that is hard to detect in cross-sectional data and that cautions against reading correlations between beliefs and occupational choices as evidence that beliefs precede those choices.

The remainder of the paper is structured as follows. Section 2 outlines our survey experiment. Section 3 presents and discusses the experimental results on the role of perceived pressure. In Section 4, we turn to additional analyses on the role of internal factors, and Section 5 concludes.

2 The Survey Experiment

Our study was conducted in 16 secondary schools in Germany (Lower Franconia, Bavaria) between June and July 2023.[8] The German secondary school system tracks students from grade 5 onward into three main tracks: the non-academic *Realschule* and *Mittelschule*, which primarily prepare students for vocational training, and the academic track *Gymnasium*, which leads to university education. We focused on *Realschulen* and *Mittelschulen* as students from these school types account for approximately two-thirds of all new apprenticeship contracts in Bavaria (BIBB, 2025), making them the primary pipeline into vocational training.

Data collection: The survey was administered to students in grade levels 6 through 9 in *Realschule* and 6 through 8 in *Mittelschule*, covering in both cases all school years during which professional orientation takes place through the year in which students typically choose between vocational training and continued education.[9] Data collection took place during

[8]We recruited schools in collaboration with the Bavarian State Ministry of Education and Cultural Affairs, and are particularly grateful to MB Marcus Ramsteiner (*Ministerialbeauftragter*) and BerR Christian Freiburg (*BerufsRat*) for their invaluable support.

[9]In 2022, 12.4% of students who completed compulsory schooling neither pursued vocational training nor continued their education (Statistisches Bundesamt, 2023).

regular school hours, in designated spaces in schools (e.g., libraries, classrooms, or cafeterias). Students participated class-wise, often with several classes attending simultaneously.

Participation required prior parental consent, for which schools distributed information letters and collected signed consent forms. Only students with parental consent took part in the study (on average 61.4% of students in participating schools ended up completing the survey, with participation shares ranging from 25.9% to 85.6% across schools). Upon verifying parental consent, we randomly seated students at desks arranged across the room, each equipped with a tablet for survey completion and an individual envelope containing three items: (i) a unique code enabling students to log into the survey, (ii) a QR code linking to a code-specific file in which the student's stated career aspirations would be stored upon survey completion, and (iii) a letter inviting parents to complete a parallel survey, accessible via QR code using the same unique code as their child. Parents were thus contacted indirectly through their children. The unique access code determined each student's treatment assignment (see below for details) and allowed us to match student and parent responses.

In what follows, we describe the outcome, treatment and internal factors such as tastes for and beliefs about a large array of job attributes. Please refer to Appendix C for the instructions and the complete questionnaire.

Outcome – Occupational aspirations: We elicited students' occupational aspirations by asking in which field they would prefer to start vocational training upon completing secondary school. Following the official classification of the German Federal Employment Agency (*Bundesagentur für Arbeit*), students were asked to choose among four vocational fields, differing markedly in gender composition (BIBB, 2025): *Business* (gender-balanced), *Construction* (male-dominated), *Service* (female-dominated), and *STEM* (male-dominated).[10] To ensure a consistent understanding of each field, students received a printed overview describing each field and listing example occupations (shown in Table C.2 in Appendix C).

Our main outcome is a binary variable indicating whether a student aspires to pursue a STEM vocational training. We also asked students to rate their interest in each of the four vocational fields on a continuous scale from 0 (*not at all interesting*) to 100 (*very interesting*).

[10]The four fields cover the following occupational areas: *Business* includes business, administration, art, culture, design, and media (e.g., office clerks, tax assistants, media designers); *Construction* includes construction, surveying, metal construction, mechanical engineering, production, manufacturing, agriculture, transportation, and logistics (e.g., bricklayers, carpenters, industrial mechanics, farmers); *Services* includes service occupations, health, social work, and education (e.g., hotel specialists, medical assistants, nurses, educators, cooks); and *STEM* includes science, IT, and engineering (e.g., laboratory technicians, IT specialists, electronics technicians, mechatronics technicians).

Treatment – Parental and peer observability: To identify whether students adjust their stated occupational aspirations in response to perceived pressure, we embedded a randomized experiment within the survey, following a similar approach to Müller (2026). Specifically, we varied the observability of students' stated aspirations to their parents and peers by randomly assigning students to one of three conditions, each associated with a distinct instruction shown at the beginning of the occupational aspirations module:

"The next 5 questions are about your future plans! These are important questions! That's why we are providing a copy of your answers for...

- *...* ***you and your parents*** [**Parent condition**]. *Please discuss your answers about your future plans with your parents. Your answers will not be shared with anyone except for your parents.*
- *...* ***you and 2-3 of your classmates*** [**Peer condition**]. *Please discuss your answers about your future plans with your classmates. Your answers will not be shared with anyone except for your classmates.*
- *...* ***you*** [**Private condition**]. *You can look at your answers again at home. Your answers will not be shared with anyone but you.*

To verify comprehension of the treatment instructions, students were asked to identify the audience with whom they were instructed to share their aspirations. 47% of students correctly identified their assigned audience on the first attempt, the remaining 53% were prompted to re-read the instructions before answering again. Students could only proceed with the survey upon answering correctly.

Upon survey completion, students' stated aspirations were uploaded to a personalized file, accessible via the individual QR code contained in the envelope. The experimental variation did not alter the accessibility or existence of responses, but rather the audience to whom students were instructed to disclose and discuss their aspirations with. Treatment differences thus operated exclusively through anticipated observability, while access technology and response storage were held constant across conditions. Since compliance depended on students expecting to follow instructions, the estimated effects likely represent a lower bound of the behavioral response that would arise under fully enforced observability.[11]

Assignment to treatment conditions was randomized at the individual level within experimental sessions: envelopes containing unique access codes were placed randomly on

[11]Students scanned the QR code to access their answers after the survey at rates of 27.1% in the *private* condition, 27.3% in the *peer* condition, and 29.7% in the *parent* condition. Those who scanned it did so 2.6 times on average.

students' desks before their arrival, with one third pre-assigned to the *parent* condition, one third to the *peer* condition, and one third to the *private* condition. Treatment status was known only to the individual student, as the condition-specific instructions were displayed privately within the survey. This design generates exogenous within-session variation in the anticipated observability of students' stated occupational aspirations. Individual-level randomization within session was chosen to maximize statistical power relative to session-level randomization.[12] The between-subject design allows us to identify differences in aggregate shares. Effects might, however, be heterogeneous, with some individuals reacting in the opposite direction from the average individual. The share of individuals reacting to the treatment might thus be considerably higher than the estimated average treatment effects show.

Tastes for job attributes and beliefs: To provide a comprehensive picture about the determinants of occupational aspirations, we further elicited students' tastes for key job attributes and beliefs to which extent these job attributes materialize in the different occupational fields. We identified 14 job attributes, out of which nine relate to the apprenticeship period, while the remaining five concern longer-term career prospects. The nine apprenticeship-related attributes are completing the vocational training (*graduate*), being good at what one does (*good at it*), enjoying the tasks (*enjoy*), not finding the work too demanding (*too demanding*), having enough money to live on during the training (*enough money*), making one's parents proud (*proud parents*), parents being able to help (*parents can help*), feeling comfortable in the work environment (*feel comfortable*), and not having to fight against prejudice, e.g., based on gender or background (*facing prejudice*). The five longer-term attributes are earning well (*good income*), helping others (*help others*), making the world a better place (*help world*), a good balance between work and family, friends, and leisure (*work-life balance*), and a job with a desirable social status (*desirable status*).[13]

To elicit tastes, we asked students to consider their plans after secondary school and indicate how important each of the 14 attributes was to them. Responses were recorded using sliders anchored at *totally unimportant*, *somewhere in between*, and *totally important*. To elicit beliefs, we asked students to imagine pursuing an apprenticeship in each of the

[12] One potential limitation of this randomization choice is that students may have learned about the different conditions through communication with classmates after completing the survey. This does not threaten internal validity, however, since aspirations were elicited before any such communication could occur.

[13] We use the labels in parentheses in all figures and tables. For the two negatively framed attributes, tastes refer to the importance of *not* finding the work too demanding and of *not* facing prejudice, whereas beliefs refer to the likelihood of finding the work too demanding and of facing prejudice; the labels of the tastes exhibits carry the *not*.

four occupational fields and assess whether they expected each attribute to materialize in that field.[14] Students were instructed to think either of an occupation within the field that suited them best or of the field more generally. Beliefs were elicited using sliders anchored at *definitely not*, *maybe*, and *definitely*. The order in which occupational fields were presented was randomized. For both tastes and beliefs, students were required to tap the slider before proceeding, even if its initial position already reflected their answer.

This elicitation procedure allows us to distinguish students' preferences over job attributes from their expectations about realizing these attributes in different occupational fields. Descriptive statistics of tastes and beliefs are presented in Section 4.

Additional variables: The student survey further elicited students' prior reflection on and certainty about their career plans and how often and openly they discuss these plans with parents, siblings, and peers. Students were also asked about their favorite school subjects and their grades in math and languages (German and English). We further elicited students' beliefs about the occupational field their parents would want them to choose, a measure we use to compare perceived and actual parental preferences. To obtain the latter, we invited parents to complete a parallel survey; 18.5% of students had at least one responding parent.

Sample and balance: All together 2,840 students (510 sixth-graders, 843 seventh-graders, 746 eighth-graders, and 741 ninth-graders) across 14 *Realschulen* and 2 *Mittelschulen*, located in both urban and rural areas of Lower Franconia, Bavaria, took part in our survey. Among all participating students, 85% finished the entire survey.

Table 1 provides descriptive statistics and evidence for experimental balance by gender.[15] More than two thirds of the students come from a low-education background, defined as neither parent holding a university entry qualification (Abitur), one third have a migration background, defined as at least one parent born abroad, and almost one fifth live in a single parent household. Students are balanced across the *private*, *parent*, and *peer* conditions in terms of socio-demographic background characteristics and pre-treatment variables: in the case of girls, 0 (5) out of 48 comparisons are statistically significant at the 5% (10%) level, and in the case of boys, 1 (5) out of 48 comparisons are statistically significant at the 5% (10%) level.

[14] Students were randomly assigned to one of two belief module orders: 75% first filled out the four occupational fields, while the remaining 25% first evaluated three alternative educational and employment pathways (continuing school to obtain the *Abitur*, starting vocational training, or entering employment without an apprenticeship). The other belief module was asked at the end of the survey, but only if students had spent less than 25 minutes since the start of the survey.

[15] Descriptive statistics and evidence for experimental balance by gender and cohort are shown in Tables A1, A2, A3, and A4.

Table 1: Experimental Balance by Gender

	Girls					Boys				
	Private	Parent	*Par. vs. Priv. (p-value)*	Peer	*Peer vs. Priv. (p-value)*	Private	Parent	*Par. vs. Priv. (p-value)*	Peer	*Peer vs. Priv. (p-value)*
Socio-Demographic Variables										
At least 1 parent with Abitur	0.29	0.25	0.129	0.31	0.643	0.27	0.21	0.064	0.27	0.891
Residing with mother	0.97	0.98	0.690	0.99	0.139	0.97	0.95	0.225	0.96	0.728
Residing with father	0.83	0.81	0.308	0.85	0.531	0.85	0.83	0.396	0.85	0.748
Number of siblings	1.45	1.50	0.473	1.43	0.762	1.49	1.49	0.975	1.42	0.352
Born in Germany	0.94	0.94	0.661	0.92	0.374	0.92	0.93	0.668	0.92	0.759
Migration background	0.32	0.30	0.542	0.34	0.472	0.32	0.30	0.488	0.33	0.723
Catholic	0.67	0.62	0.150	0.61	0.056	0.59	0.56	0.527	0.64	0.083
Protestant	0.20	0.21	0.467	0.21	0.503	0.22	0.22	0.978	0.19	0.230
Pre-Treatment Variables										
Thought about career plans (1–5)	3.44	3.45	0.820	3.51	0.188	3.21	3.24	0.603	3.28	0.222
Certainty about career plans (0–100)	52.75	52.43	0.850	53.50	0.654	56.15	53.44	0.134	55.85	0.872
Importance: Graduate	81.48	81.21	0.842	82.94	0.286	75.95	75.49	0.789	77.07	0.519
Importance: Good at it	84.46	85.01	0.590	86.14	0.098	82.84	82.08	0.511	84.60	0.113
Importance: Enjoy	87.24	86.68	0.605	88.00	0.470	83.37	83.50	0.918	84.41	0.413
Importance: Not too demanding	60.96	60.42	0.701	59.36	0.276	54.01	56.49	0.122	53.98	0.987
Importance: Enough money	91.96	91.39	0.512	90.28	0.064	89.84	91.77	0.051	91.17	0.202
Importance: Proud parents	74.74	71.55	0.059	74.15	0.722	76.07	75.72	0.840	74.23	0.310
Importance: Parents can help	55.08	53.33	0.297	52.14	0.078	51.70	53.34	0.356	51.51	0.916
Importance: Feel comfortable	89.03	89.30	0.770	89.71	0.460	85.62	85.92	0.792	86.58	0.399
Importance: Not facing prejudice	79.36	78.31	0.531	80.25	0.590	67.32	66.05	0.581	61.91	0.023
Importance: Good income	87.62	87.74	0.909	86.44	0.259	87.78	86.95	0.415	87.74	0.968
Importance: Help others	65.58	65.17	0.785	65.19	0.800	53.81	54.93	0.514	56.03	0.215
Importance: Help world	53.74	53.12	0.674	53.63	0.938	50.03	53.04	0.071	51.33	0.438
Importance: Work-life balance	86.18	85.13	0.352	86.06	0.912	84.05	84.75	0.578	83.33	0.581
Importance: Desirable status	38.95	41.32	0.189	40.28	0.448	43.56	46.41	0.164	45.39	0.381

Notes: p-values from heteroskedasticity-robust t-tests comparing each treatment condition to the private condition.

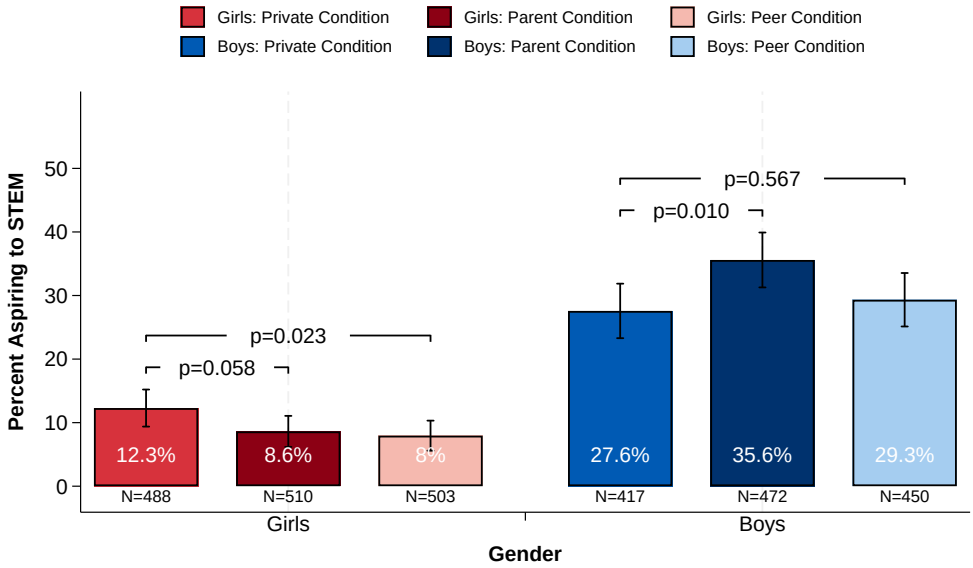
3 Experimental Results: The Role of External Factors

3.1 The Effect of Observability

Does the observability of students' occupational aspirations to parents and peers affect their stated STEM aspirations? Figure 1 and Table 2 speak to this question, presenting experimental results pooled across all school grades and comparing the share of boys and girls aspiring to STEM across the *private*, *parent*, and *peer* conditions.

Turning first to privately stated STEM aspirations, we find a substantial gender gap: 12.3% of girls aspire to pursue vocational training in a STEM occupation, compared to 27.6% of boys, a gap of 15.3 percentage points ($p < 0.001$). When students' aspirations are made observable to parents, the share of girls aspiring to STEM decreases by 3.7 percentage points, from 12.3% to 8.6% ($p = 0.058$), while the share of boys increases by 8.0 percentage points, from 27.6% to 35.6% ($p = 0.010$). The observability of aspirations thus widens the gender gap from 15.3 to 27.0 percentage points ($p = 0.001$), a relative increase of 76.5%.

Figure 1: Experiment: Gender and STEM aspirations



Notes: This figure presents the share (and 95 percent confidence intervals) of girls and boys aspiring to vocational training in STEM in the *private*, *peer*, and *parent* conditions. The graph reports the p-value of the pairwise difference between the shares in the *private* and *parent* conditions, as well as between the *private* and *peer* conditions, for each gender separately.

Adjustments under peer observability follow a similar pattern but are weaker, particularly for boys. The share of girls aspiring to STEM declines by 4.3 percentage points, from 12.3% to 8.0% ($p = 0.024$), while the share of boys increases only marginally, by 1.7 percentage points, from 27.6% to 29.3% ($p = 0.567$), and is not significant at any conventional level.

Peer observability consequently widens the gender gap from 15.3 to 21.3 percentage points ($p = 0.092$), a relative increase of 39.2%.

Table 2 displays the experimental results when additionally including school-by-grade-level fixed effects (columns 2, 4, and 6). The experimental results are robust to this specification. The decline in girls' STEM aspirations is stable across both the *parent* and *peer* conditions, amounting to 3.9 percentage points in each case (significant at the 5% level). The increase in boys' STEM aspirations under parental observability remains at 8.0 percentage points, while the effect under peer observability is small and statistically insignificant. Consequently, under parental observability the gender gap widens by 11.9 percentage points (a relative increase of 77.7%). The corresponding effect under peer observability is 4.8 percentage points (31.4%), though it falls short of conventional significance levels.

Table 2: Experimental results – Outcome: "STEM"

	DV: Aspires to STEM					
	All		Girls		Boys	
	(1)	(2)	(3)	(4)	(5)	(6)
Male	0.153***	0.167***				
	(0.026)	(0.027)				
Parent Condition	-0.037*	-0.040**	-0.037*	-0.039**	0.080**	0.080**
	(0.019)	(0.020)	(0.019)	(0.020)	(0.031)	(0.032)
Male X *Parent*	0.117***	0.123***				
	(0.037)	(0.037)				
Peer Condition	-0.043**	-0.040**	-0.043**	-0.039**	0.018	0.009
	(0.019)	(0.019)	(0.019)	(0.019)	(0.031)	(0.031)
Male X *Peer*	0.061*	0.055				
	(0.036)	(0.036)				
Share Omitted Cat.	0.123	0.123	0.123	0.123	0.276	0.276
School x Grade FE	-	✓	-	✓	-	✓
Observations	2,840	2,840	1,501	1,501	1,339	1,339
R^2	0.077	0.097	0.004	0.046	0.006	0.035

Notes: Each column reports the results of a different regression, for the whole sample (columns 1-2), girls (columns 3-4), and boys (columns 5-6). Column (1), (3) and (5) report the raw comparison, columns (2), (4) and (6) add school-by-grade fixed effects. Share Omitted Cat. is the share aspiring to STEM among girls (columns 1-4) or boys (columns 5-6) in the *private* condition. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Taken together, the results reveal a striking gender asymmetry: observability consistently pushes girls away from STEM while pulling boys toward it, contributing to a widening of the gender gap. Strikingly, these experimental adjustments in the stated aspirations align closely with students' actual occupational choices: among graduates from the participating

secondary schools who go on to vocational training, 33.8% of boys but only 7.1% of girls choose a STEM occupation. This 26.7 percentage point gap in actual choices is far closer to the 27.0 percentage point gap in the *parent* condition and the 21.3 percentage point gap in the *peer* condition than to the 15.3 percentage point gap in the *private* condition, suggesting that social observability, rather than private preferences alone, plays a meaningful role in shaping the gender gap in STEM that ultimately emerges in the labor market.

Aspirations for other occupational fields: Since students could choose only one preferred occupational field, any shift in aspirations toward STEM must necessarily be accompanied by an offsetting shift in aspirations for other fields. Examining the other occupational fields therefore helps us understand where students move when they shift toward or away from STEM, and whether parental or peer observability exert a systematic effect on aggregate shares beyond STEM. Results are shown in Appendix Tables A5-A7.

The results suggest that the clearest and most consistent effect of parental and peer observability on aggregate shares is on STEM vocational aspirations. Parental observability appears to increase girls' aspirations for occupations in services, though the estimates are not significant at any conventional level (see Table A6). The share of boys aspiring to an occupation in construction declines under parental observability, yet the estimates are marginally significant at best (see Table A7). This decline likely reflects boys reallocating from occupations in construction to STEM. For business-related occupations, we find no evidence that parental or peer observability affects aggregate aspirations, and the gender gap remains essentially unchanged (see Table A5).

We further examined adjustments in students' ratings of the four occupational fields on a continuous scale from 0 to 100. Unlike the binary STEM aspiration measure, this elicitation does not impose a mechanical trade-off between fields. The results are consistent with the main findings (see Appendix Tables A8–A11): girls' ratings of STEM occupations decline significantly under both parental observability (from 42.2 to 36.8, $p = 0.006$) and peer observability (from 42.2 to 38.2, $p = 0.032$), while boys' ratings increase significantly under parental observability only (from 58.5 to 63.8, $p = 0.022$).[16] Effects on ratings of the remaining three fields are small and statistically insignificant throughout.

3.2 The Effect of Observability Across Grade Levels

When do parental and peer observability first shape students' STEM aspirations and do these effects persist across grade levels? Figure 2 presents the experimental results separately for

[16] Observability shifts the whole distribution of interest in STEM, not only its mean (Figure A1).

students in sixth, seventh, eighth and ninth grade (Panel A for parental observability; Panel B for peer observability), with full regression results shown in Appendix Table A12.

Considering parental observability, girls strongly reduce their STEM aspirations as early as in sixth grade, with the share falling from 17.8% in the *private* condition to 4.5% in the *parent* condition and thus by 13.3 percentage points ($p = 0.005$). Strikingly, girls' privately stated STEM aspirations plummet in seventh grade and never recover to sixth-grade levels in subsequent years, fluctuating between 10.7% and 11.2% in grades seven through nine. After the initial adjustment in sixth grade, parental observability exerts no further significant effect on girls' STEM aspirations, with the exception of a marginally significant reduction in eighth grade (by 5.9 percentage points, $p = 0.092$). These results are robust to the inclusion of school fixed effects. Peer observability produces a similar pattern for girls' STEM aspirations, but the experimental estimates lack significance throughout.

Unlike girls, boys do not adjust their STEM aspirations in sixth grade under parental observability. From seventh grade onward, however, boys consistently increase their aspirations in the *parent* condition by 8.6 to 12.0 percentage points, with statistically significant effects in seventh and eighth grade. Peer observability, by contrast, does not appear to encourage boys to pursue STEM at any stage, with effects that are small and statistically insignificant throughout.

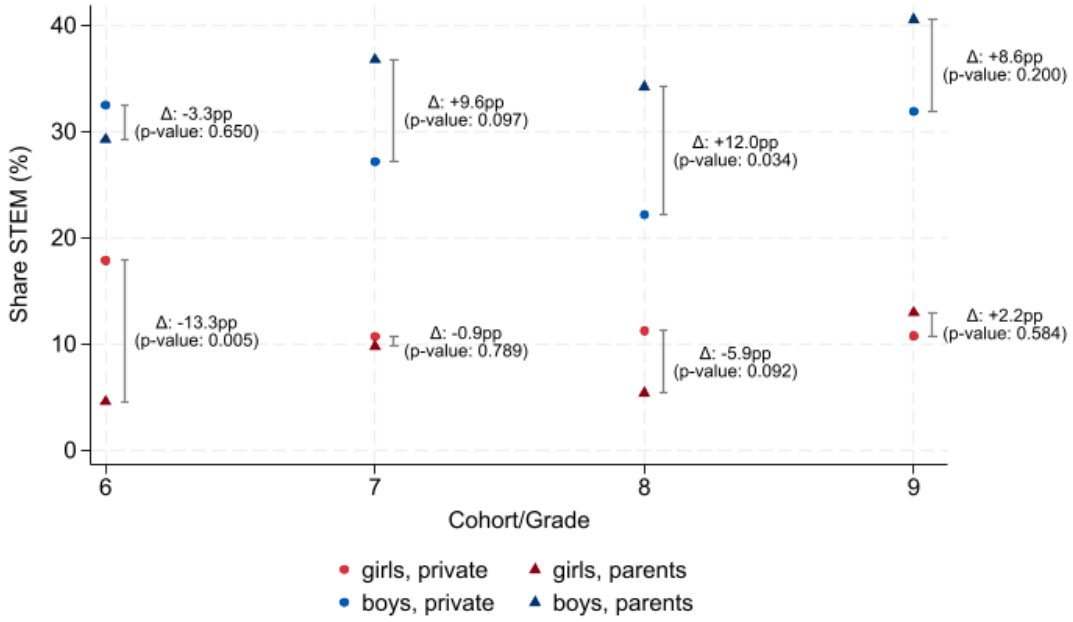
Notably, boys' *privately* stated STEM aspirations decline in seventh and eighth grade before recovering in ninth grade, and perceived parental pressure counteracts this temporary decline. As Section 4 shows, some of boys' beliefs about STEM also become more pessimistic across grades, although, unlike their aspirations, they do not recover in ninth grade. This suggests that changing beliefs may contribute to the decline in boys' private aspirations, although both patterns could also reflect common factors, such as the increasing difficulty of mathematics and other STEM subjects in higher grades.

Taken together, these results paint a nuanced picture of how observability shapes the gender gap in STEM aspirations across grade levels. The gap persists in every grade, reflecting both differences in privately stated aspirations and the added effect of parental and peer observability. The relative importance of these components, however, evolves over time. Parental observability pushes girls away from STEM as early as sixth grade, widening the gap relative to the private condition, with peer observability pointing in the same direction. These effects are less pronounced and less consistent in later years, partly because girls' *privately* stated aspirations drop sharply in seventh grade and never recover.[17] This suggests

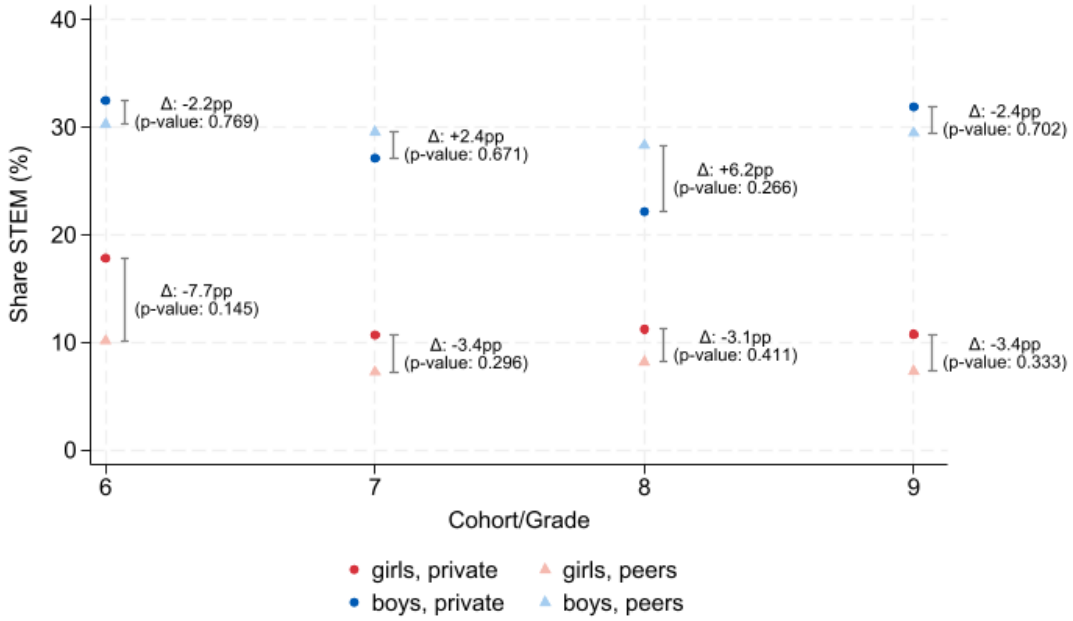
[17]The sharp drop in girls' privately stated STEM aspirations in seventh grade also coincides with the introduction of fields of specialization (focusing more on math, languages, or commerce). Specialization at such a young age may lock in students' aspirations, making later revisions less likely and helping to explain why girls' private STEM aspirations never recover. While our data do not allow us to examine the role of

Figure 2: Experiment: Gender and STEM aspirations across grade levels, parent treatment (top) and peer treatment (bottom)

(a) Parent Treatment



(b) Peer Treatment



Notes: This figure presents the share of girls and boys aspiring to STEM in the *private* condition and in the *parent* condition (top panel) or the *peer* condition (bottom panel), separately for grades 6, 7, 8, and 9. The annotations report the treatment effect in percentage points and the p-value of a two-sided test of proportions, by gender.

that early external influences may become internalized, contributing to the persistent decline in girls' private aspirations. For boys, parental observability steers them toward STEM from seventh grade onward, further widening the gap relative to the private condition throughout secondary school, whereas peer observability plays no significant role at any stage.

3.3 Interpreting the Effect of Observability

In this section, we first discuss our interpretation of the experimental effects as reflecting perceived parental and peer pressure. We then provide empirical evidence supporting this interpretation over alternative explanations, particularly the possibility that observability induces more deliberate choices rather than adjustments to perceived social expectations.

Perceived parental and peer pressure: Our design randomly varies the observability of students' stated aspirations to *parents* and *peers*. The treatment effect thus captures behavioral adjustments induced by these shifts in observability. Following Bursztyn and Jensen (2015) and Bursztyn, Egorov and Jensen (2018), we interpret any peer observability-induced deviation from privately stated aspirations as evidence of perceived peer pressure and interpret any parental observability-induced deviation equivalently as due to perceived parental pressure. Importantly, such pressure does not require explicit imposition or sanctions, it may emerge whenever observable choices carry different perceived social benefits or costs, such as avoiding disagreement, conforming to perceived expectations, or signaling desirable traits (Assor, Roth and Deci, 2004). We deliberately use the term *perceived* pressure to remain agnostic about whether parental or peer expectations are objectively imposed or empirically justified. The mechanism operates as long as students perceive such expectations as relevant to their choices.

Our design does not allow us to disentangle the precise psychological mechanisms underlying the observed behavioral adjustments. In fact, the experiment isolates non-internalized pressure only. Any influence that has already been internalized into students' private aspirations, as showcased for girls in later grade levels, is not captured by our design. Our estimates therefore likely represent a lower bound on the total influence of perceived parental and peer expectations on students' occupational aspirations, an issue to which we return later.

In what follows we provide empirical evidence supporting our interpretation of the experimental results as the effect of perceived parental and peer pressure, but also discuss alternative explanations.

specialization choices directly, the institutional context highlights the potential importance of early social influences before students' career trajectories solidify.

Perceived vs. actual parental expectations: An important follow-up question is what students perceive parental and peer expectations to be and whether such perceptions align with actual parental and peer preferences. Due to constraints on survey length and design complexity, we elicited only beliefs about parents' expectations, and not about peers' expectations. Figure A2 presents both perceived and actual parental preferences, based on data from the student and parent surveys (Panel a and b, respectively).

Beginning with students' perceived expectations: only 10.4% (13.8%) of girls believe their mother (father) would like them to pursue a career in STEM, compared to 34.4% (35.2%) of boys. The resulting gender gap in perceived parental expectations, 23.9 percentage points for mothers and 21.4 percentage points for fathers, substantially exceeds the 15.3 percentage point gap in students' *private* aspirations and is close to the 27 percentage point gender gap observed in the *parent* condition. Students' perceptions of parental preferences and the resulting gender gap are remarkably stable across grades (see Figure A3). These statistics are consistent with students acting on their beliefs about parental expectations.

Turning to parents' actual expectations: 10.4% of mothers and 13.5% of fathers report preferring a STEM career for their daughters, compared to 48.6% and 53.8%, respectively, for their sons. Thus, the gender gap in *actual* parental aspirations regarding their children's occupational choices is even larger than students perceive it to be. Also this pattern is rather stable across grades (see Figure A4).

Openness in communication with parents and peers: We further investigate effect heterogeneity by how openly students talk with their parents and peers about their future career aspirations. We might expect stronger effects of observability among students who do not openly discuss their aspirations with others, either because their preferences are less well known or because they are reluctant to reveal aspirations that may conflict with perceived social expectations. Consistent with this interpretation, we observe stronger effects of parental observability for both boys and girls who report not talking openly to their mothers and fathers, although these effects are not statistically different from those for students who report talking openly (see Figure A5). The corresponding patterns for peer observability are less clear (see Figure A6).

More deliberate choices under observability: A key assumption in our design is that the *private* condition captures the part of students' aspirations driven by their intrinsic interests as well as any social concerns internalized. A potential concern is that responses in the *private* condition may reflect less deliberate consideration, given that they may be perceived as lower-stakes than responses in the *parent* and *peer* conditions. In that case,

differences across conditions could reflect greater attentiveness due to higher perceived stakes in the observable conditions, rather than genuine adjustments to social observability.

Several lines of evidence suggest that this concern is unlikely to drive our results. First, survey completion time, used here as a proxy for attentiveness, does not differ systematically across conditions, suggesting that the observed treatment effects reflect genuine adjustments to observability rather than differences in effort or engagement. Second, inconsistencies between students' forced aspirational choice and continuous interest ratings are stable across the conditions (6.2% in the *private* condition, 7.1% in the *parent* condition, and 6.5% in the *peer* condition). Likewise, the treatment effects are robust to excluding observations with inconsistent answers between forced choice and independent ratings. Third, the shifts observed in the *parent* and *peer* conditions systematically reinforce stereotypical patterns, a regularity inconsistent with noise or careless responding in the *private* condition. Fourth, the direction of the treatment effects closely mirrors students' beliefs about their parents' expectations as well as parents' actual stated preferences, two independent sources of evidence pointing in the same direction.

Prior Reflection on Career Plans: A further way to assess whether our results are driven by less deliberate responses in the *private* condition is to focus on students who report having already thought carefully about their career plans, for whom privately stated aspirations are less likely to be careless or arbitrary. Strikingly, the effects of observability are, if anything, stronger among these students than among less reflective ones (see Figure A7). When asked privately, more reflective students express less gender-stereotypical aspirations: 13.4% of more reflective girls and 19.4% of more reflective boys aspire to STEM, compared to 11.3% and 31.4% of their less reflective female and male counterparts. Under parental observability, however, this difference largely disappears, with about 8 to 9% of girls and 36.0% of boys aspiring to STEM regardless of prior reflection. The increase among more reflective boys, 16.3 percentage points ($p = 0.001$), is four times the increase among less reflective boys (4.1 percentage points, $p = 0.30$). Likewise under peer observability, reflective girls decrease their STEM aspirations (-5.3 percentage points, $p = 0.06$) and reflective boys increase them (+7.9 percentage points, $p = 0.11$). Observability thus suppresses counter-stereotypical aspirations even among students who have considered their plans more carefully, reinforcing our interpretation that the effects reflect perceived social pressure rather than differences in how deliberately students respond.

3.4 Parental Pressure and Comparative Academic Advantage

We next examine whether parental observability improves the alignment between students' STEM aspirations and their comparative academic strengths, and whether gender differences in these strengths can explain the observed treatment effects. We classify students as having a comparative advantage in mathematics if their mathematics grade exceeds both their German and English grades, a comparative advantage in languages if it is lower than both, and no clear advantage otherwise.[18] Figure A8 presents STEM aspirations across experimental conditions for these three groups.

In the private condition, students with a mathematics advantage are more likely to aspire to STEM than those with a language advantage, although substantial gender differences persist within each group. Parental observability strengthens this relationship for both genders: girls with a mathematics advantage increase their STEM aspirations by 7.9 percentage points ($p = 0.22$), while those with a language advantage reduce them by 6.9 percentage points ($p = 0.02$). Among boys, the corresponding effects are +12.3 and +3.4 percentage points, however, none of these effects is statistically significant at any conventional level. Consequently, parental observability widens the difference in STEM aspirations between students with a mathematics and a language advantage by 14.8 and 8.9 percentage points among girls and among boys. Peer observability, by contrast, shows no comparable pattern.

Importantly, however, if comparative advantage fully explained the gender-specific effects of parental observability, we would expect girls and boys with the same comparative advantage to respond similarly or to potentially even end up at comparable shares in the parent condition. Instead, the results reveal a pronounced gender asymmetry: parental observability generally pushes boys toward STEM, regardless of their comparative academic strengths, while encouraging girls toward STEM only when they have a clear advantage in mathematics and also to a lesser extent. As a result, parental observability widens the gender gap in STEM aspirations within each comparative-advantage group. The increase amounts to 10.3 percentage points among students with a language advantage, 8.9 percentage points among those with no clear advantage, and 4.4 percentage points among those with a mathematics advantage. Strikingly, even under parental observability, only 20.8% of girls with a math comparative advantage aspire to STEM, fewer than the 26.1% of boys with a language advantage who answer privately. Thus, while parental observability strengthens the alignment between STEM aspirations and comparative academic strengths, comparative advantage alone cannot explain its gender-specific effects.

[18] Grades refer to the most recent report card and are self-reported; 7% of students did not report them and are excluded from this analysis.

4 Pressure in Perspective: Internal Factors

We now assess the relative importance of perceived pressure within the broader context of how students form their occupational aspirations. Building on the literature on college major choice, we consider the role of students' tastes and subjective beliefs about different career paths (Patnaik, Wiswall and Zafar, 2021). For this purpose, we consider a large array of job attributes related to vocational training, including well-studied aspects such as individual performance and financial returns, as well as less commonly studied aspects such as comfort, enjoyment, required effort, prejudice, and parental support. We further assess attributes related to future employment, such as earnings, prestige, social environment and social impact, and work-life balance. This comprehensive approach allows us to assess the relative importance of internal and external factors and to benchmark our findings against the literature on subjective beliefs and educational choices. Importantly, our focus on younger students also allows us to investigate how beliefs develop across grade levels and become increasingly informative about occupational aspirations during early adolescence, a period that has received relatively little attention in this literature.

We first provide descriptive evidence on gender differences in tastes and beliefs during early adolescence (Section 4.1). We then use a choice model to assess the contribution of these internal factors to the gender gap in privately stated STEM aspirations and compare their relative importance with the experimentally estimated effects of perceived pressure (Section 4.2). Next, we examine how gender differences in tastes and beliefs evolve across grades and how informative these beliefs are about students' occupational aspirations (Section **??**). Finally, we investigate whether the experimental variation in the observability of aspirations also affects students' subsequently reported beliefs (Section 4.3). This last analysis sheds light on the potential endogeneity of subjective beliefs to aspirations that are themselves shaped by perceived social pressure.

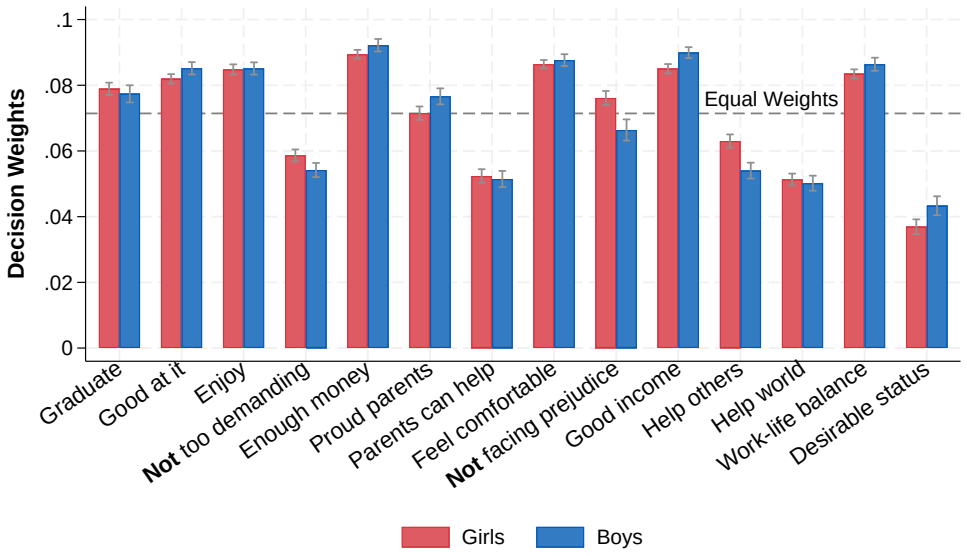
4.1 Gender Differences in Tastes and Beliefs

We begin with a descriptive picture of students' taste for job attributes. Figure 3 Panel (a) documents the relative weight students give to various job attributes when deciding on their future career path. Building on the elicitation described in Section 2, we calculate the relative weight for each attribute by dividing its reported importance by the sum of the importance ratings across all fourteen attributes for each student. We use the sample assigned to the *private* condition only to allow for comparability with the existing literature and across the statistics for tastes and beliefs.

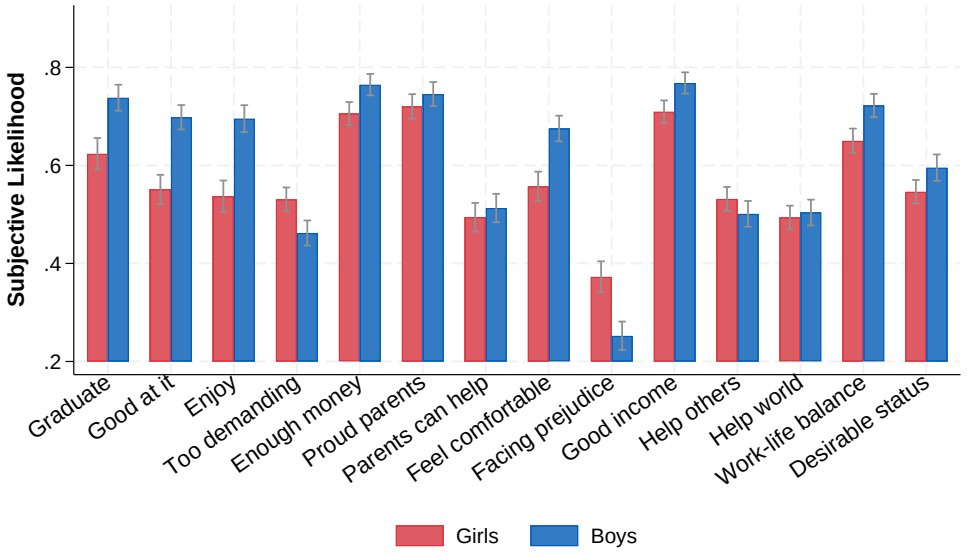
For both genders, pecuniary aspects, such as earnings during vocational training and in

Figure 3: Students' Tastes and Beliefs about Job Attributes

(a) Tastes



(b) Beliefs



Notes: Panel (a) shows the average relative weight (and the 95%-confidence interval) put on each of the 14 different career aspects for both girls and boys when being asked how important these aspects are in their occupational choice. The dashed gray line indicates the relative weight if all aspects were weighted equally. Panel (b) shows the average subjective likelihood (and the 95%-confidence interval) for these 14 career aspects to materialize in STEM for both girls and boys. The likelihood varies between 0 and 1. Both sub-figures use the *private* sample only.

the future job, along with several non-pecuniary aspects, such as enjoying the work content, feeling comfortable at work, graduating from a program, being good at it, and having a good work-life balance, emerge as the most decisive self-reported factors when thinking about their career. Gender differences are relatively minor: girls are more concerned with potential prejudices attached to occupational fields and with the potential to help others at work, while boys place greater weight on money, status and making their parents proud. These findings are largely in line with the literature on college major choice, which documents that content enjoyment and parental approval matter for both genders, while boys care more about pecuniary outcomes and girls, on average, have a higher willingness-to-pay for jobs with greater flexibility and job stability (Zafar, 2013; Wiswall and Zafar, 2015; Dasgupta and Sharma, 2022).

Significant differences between both genders arise, however, in their beliefs about whether these aspects will materialize in different occupational fields. When it comes to STEM-related occupations (see Figure 3, Panel b), girls are consistently more pessimistic, not only regarding their individual performance (i.e., being good at it and graduating), but also regarding pecuniary and various non-pecuniary job aspects, such as comfort, enjoyment, and work-life balance, that is, precisely in the aspects they report to most care about. They are also more concerned about having to contend with prejudices in a STEM-related occupation.[19] A similar pattern emerges for beliefs about occupations in construction (see Figure A9), while the reverse pattern applies to service-related occupations (see Figure A10). Beliefs align between genders only for business-related occupations (see Figure A11).

4.2 Decomposition of the STEM Gender Gap

To assess the extent to which internal factors contribute to the STEM gender gap, we conduct a decomposition analysis based on a structural choice model that incorporates students' beliefs about career aspects across occupational fields and estimates the utility weights (rather than using self-reported weights) students place on each aspect. Specifically, the model assumes that students evaluate each occupational field according to their subjective likelihood that different job attributes will materialize and the utility associated with these outcomes. We estimate the utility weights using a conditional logit model, allowing them to vary by gender, such that we can predict students' counterfactual STEM aspirations and decompose gender differences in STEM aspirations into components stemming from differences in beliefs and utility weights. For this purpose, we use the subsample of students assigned to the *pri-*

[19]The gender differences in beliefs are only stronger in the other conditions as the differences in beliefs for the pooled sample show in Figure A13, which we analyze in more detail in Section 4.4.

vate condition, along with their reported beliefs about career aspects.[20] Further details on the choice model, its estimates, and the decomposition approach can be found in Appendix Section B.

To distinguish the contribution of beliefs and utility weights, we construct a counterfactual in which boys retain their beliefs but are assigned the utility weights estimated for girls. Comparing the resulting predicted STEM aspirations with those obtained using boys' own utility weights identifies the contribution of differences in utility weights; the remaining difference between boys' and girls' predicted aspirations is attributed to differences in beliefs. We further contrast the contribution of beliefs and utility weights to the STEM gender gap in private with the causal estimates of the experimental impact of perceived parental and peer pressure (i.e., the *parent* and *peer* condition).

As illustrated in Figure 4 Panel a, gender differences in students' beliefs predict a gap of 13.1 percentage points. Hence, of the 15.3-percentage-point gender gap in the *private* condition, 85.6% can be explained by gender differences in students' beliefs. Differences in estimated utility weights do not play any role, a result consistent with the data showing no gender differences in self-reported tastes for the various job aspects. Contrasting beliefs and perceived parental pressure reveals that both play an equally large role in explaining the STEM gender gap: asking students to discuss their occupational aspirations with parents increases the STEM gender gap by an additional 11.7 percentage points, compared to the 13.1-percentage-point contribution by beliefs. In comparison, perceived peer pressure matters roughly half as much as beliefs (6.1 percentage points), mainly because boys are unaffected by the prompt to discuss their occupational aspirations with peers.

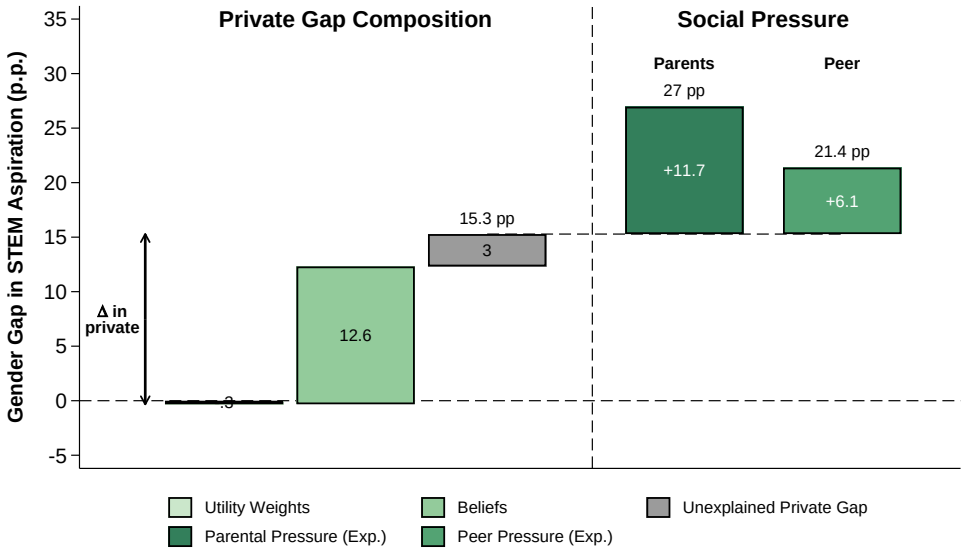
Not all beliefs matter equally for this contribution. Figure A12 isolates the role of each belief component and finds that the three belief aspects about graduating, being good at it, and enjoying contribute most to the gender gap in STEM aspirations, with all other aspects being either of secondary or no importance.

Repeating the decomposition separately by grade (after allowing utility weights to vary by both gender and grades) reveals a pronounced change in the relative importance of internal and external factors (see Figure 4 Panel b). To compare the components across grades, we express each as a share of the gender gap under parental observability, the largest gap we observe. Subjective beliefs contribute relatively little to the gap among sixth graders (27.2%), but their contribution steadily increases and reaches 71.7% among ninth graders.

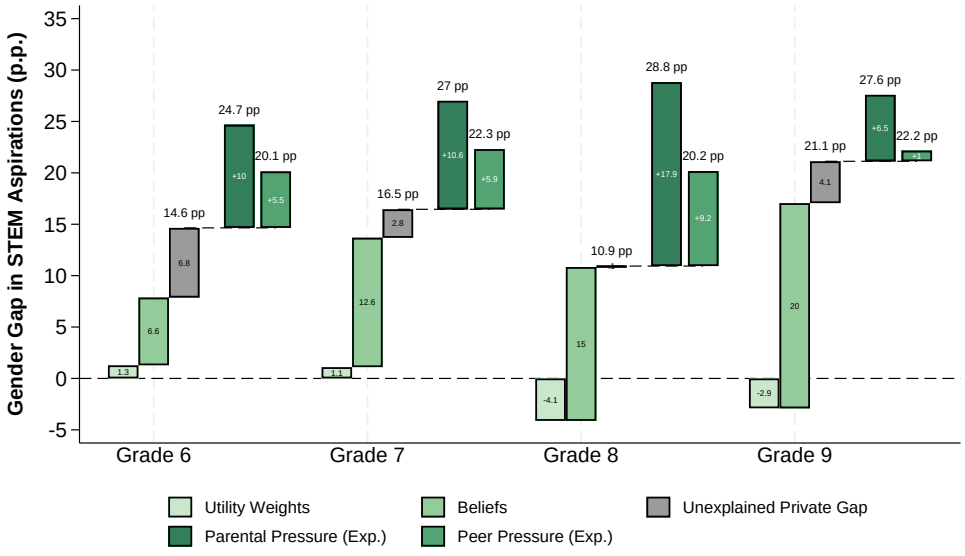
[20] We also abstain from using the *parent* and *peer* samples for the decomposition analysis to avoid any bias arising from this, as beliefs shift when they are asked to discuss their aspirations with their parents/ peers (as mentioned above and further described in Section 4.3. The reported beliefs may still be confounded with students' general tastes for specific occupational fields (see Patnaik, Wiswall and Zafar (2021)), and the resulting estimates are therefore only correlational.

Figure 4: Decomposition STEM aspirations overall and across cohorts

(a) Pooled Sample



(b) Across Cohorts



Notes: Both panels decompose the gender gap in STEM aspirations (boys minus girls, in percentage points). The first three bars decompose the gap in the *private* condition into the part predicted by gender differences in estimated utility weights, the part predicted by gender differences in beliefs, and an unexplained remainder, using the conditional logit model of Appendix B estimated on the *private* condition (Equation 4). The dashed line marks the observed private gap. The two bars to the right add the experimentally estimated increase in the gap under parental and peer observability, i.e., the gap in the *parent* (*peer*) condition minus the private gap, estimated on the pooled sample. The bottom panel repeats the decomposition separately by grade, with utility weights estimated within grade and gender. Numbers inside the bars are the contribution of each component; numbers above the bars are the resulting gaps.

The relative contribution of perceived pressure, in contrast, decreases across cohorts: while perceived parental (peer) pressure accounts for 41.1% (23.2%) of the relevant gender gap among sixth graders, it does so for only 23.5% (4.8%) among ninth graders.

When interpreting these results, it is important to bear in mind that our experimental design does not allow us to isolate external factors that have already been internalized. Beliefs may well be shaped by social influences, either directly or indirectly through social influences shaping students' aspirations. The increasing contribution of beliefs across grades therefore raises the possibility that social influences operating at younger ages become reflected in students' beliefs over time.

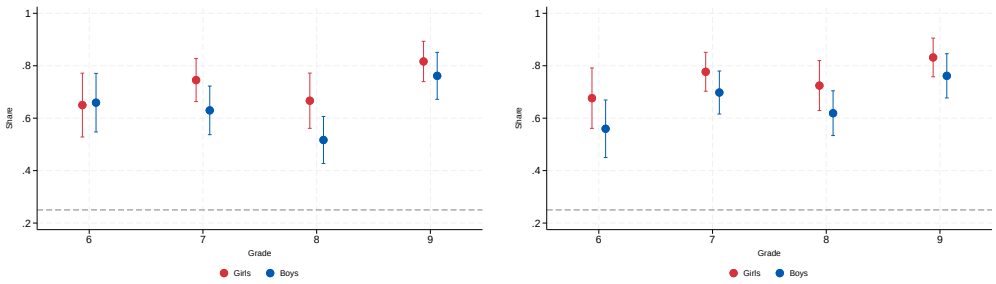
Informativeness of beliefs: To assess whether beliefs become more closely aligned with occupational aspirations as students progress through school, Figure 5 reports two different measures, both computed using the subsample assigned to the *private condition*, separately by grade and gender. The panel at the top reports the share of students who choose the occupational field about which they hold the most favorable beliefs (judged by averaging over all beliefs for each field, with the two aspects of "too demanding" and "facing prejudice" entering negatively), i.e., a belief-choice concordance measure: once for all beliefs and once for the three most relevant belief aspects as suggested by Figure A12; the panel at the bottom reports the within-student standard deviation of a belief across the four fields, averaged over the fourteen aspects, i.e., a measure of how sharply students distinguish the four fields.

Both measures increase substantially from sixth to ninth grade: belief-choice concordance rises from 66% to 81% for girls and from 66% to 76% for boys against a chance benchmark of 25%. Moreover, differentiation across fields increases by about 20% for girls and 12% for boys from grade six to nine. Restricted to the three decision-relevant beliefs, the picture is the same and the gradients are steeper: concordance rises from 69% to 84% for girls and from 56% to 76% for boys, and differentiation across fields increases by 31% for girls and 22% for boys from grade six to nine. Note that the increase is not merely a tendency of older students to use more of the response scale: students' overall dispersion across all fifty-six belief items is flat across grades, so the rise in panel (b) is specific to distinguishing between fields.

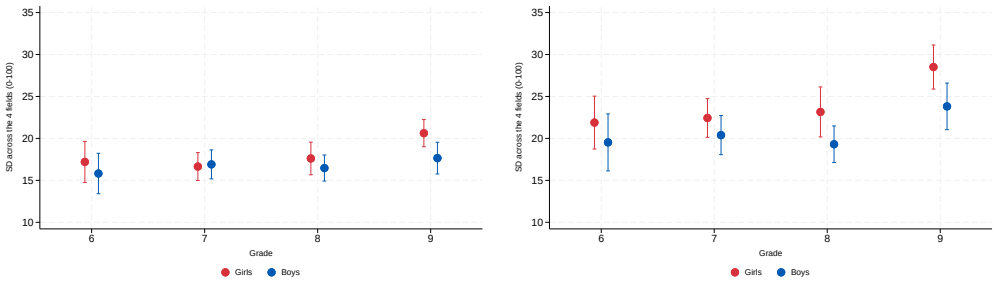
These patterns set the experimental results documented above in a developmental context. The largest effect of social observability on girls' STEM aspirations occurs in sixth grade, a point at which girls' beliefs appear comparatively less informative. Similarly for boys, we see strong impacts of parental observability in grades 7 and 8 and thus in grade levels where their beliefs are less informative than they start to be in grade 9. Social pressure thus operates before beliefs have crystallized into a stable, choice-relevant structure, and the

Figure 5: Informativeness of beliefs

(a) Belief-Choice Concordance (left: all beliefs, right: top 3 beliefs)



(b) Differentiation across fields (left: all beliefs, right: top 3 beliefs)



Notes: In panel a), this figure presents the share (and 95 percent confidence intervals) of girls and boys for whom the occupational field aspired to is equal to the field with the most positive belief index (for all beliefs on the left and the top three beliefs on the right), across grades 6, 7, 8, and 9. In panel b), it presents the within-student standard deviation across the four possible fields, averaged over the 14 belief aspects (on the left) and over the top three beliefs (on the right), separately for girls and boys and across grades.

sharpest adjustment in girls' beliefs occurs immediately afterwards. While our cross-cohort design cannot establish that the timing of one drives the other, this sequencing is consistent with the interpretation that social pressure does not only act on aspirations at the moment of choice, but may also directly or indirectly shape the beliefs on which later choices are based, a concern we turn to in the next subsection.

4.3 Experimental Results: The Impact of Observability on Beliefs

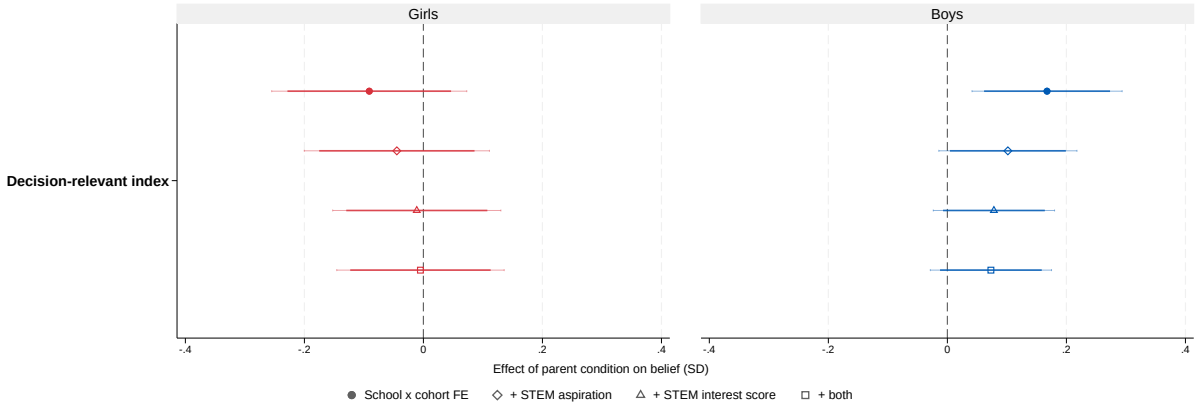
To investigate whether perceived social pressure also affects students' subjective beliefs, we exploit the experimental variation in the observability of occupational aspirations. Importantly, the observability manipulation applied only to students' occupational aspirations, not to their beliefs. The belief questions were administered after the aspiration module, and students were explicitly informed that their remaining survey responses would be kept confidential and shared with no one. Thus, we examine whether students who previously stated their occupational aspirations under different observability conditions subsequently report different beliefs, even though these beliefs are elicited privately. Beliefs should thus not vary because beliefs themselves were observable but due to an effect of having been asked about one's aspirations under parental or peer observability, or due to having given different answers in these conditions. As all of these possibilities stem from differences in the social nature of the conditions, we see the results as reflecting some causal impact of social influences, even if we cannot distinguish the exact mechanism.

Figure 6, Panel a shows the effects of parental observability of occupational aspirations on students' subsequently reported beliefs about STEM for an index of the top three beliefs (Figure A14 shows results for all belief aspects separately), showing a positive adjustment for boys of +.157 standard deviations ($p = 0.015$) and a negative adjustment for girls of -.103 standard deviations ($p = 0.22$). Girls become more pessimistic about their chances of graduating, helping others, and work-life balance, and less concerned about prejudice. While these effects are sizable, they are not significant at any conventional level (with the exception of facing prejudice). Boys instead report more optimistic beliefs about being good at it, enjoyment, comfort (as well as having enough money during training and earning a good income later), with all effects being significant at the 5% level. When aspirations are visible to peers (see Figure 6, Panel b), girls become more likely to perceive the occupation as too demanding and less focused on helping others. Boys' subjective beliefs are unchanged in the *peer* condition.

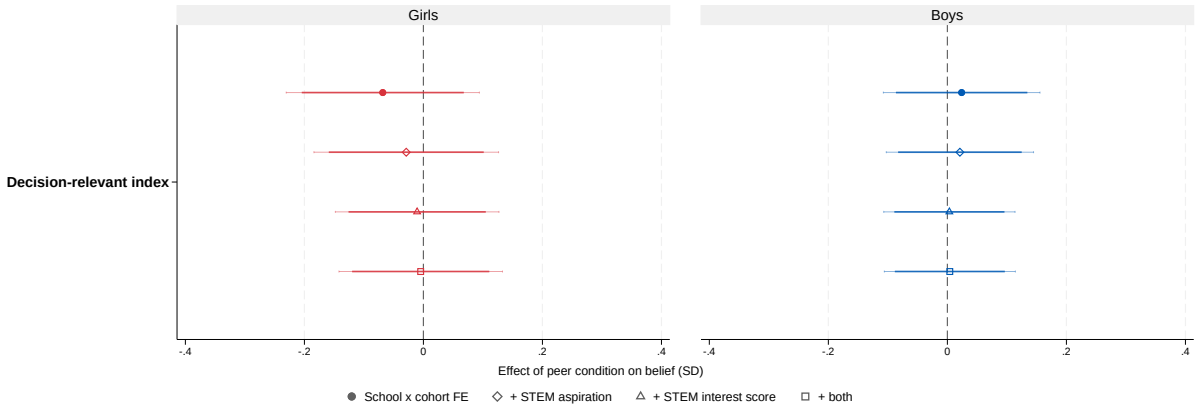
Thus, students' beliefs about STEM occupations shift measurably once they are prompted to discuss their occupational aspirations with others, suggesting that beliefs are not fixed but

Figure 6: Experimental Results – Outcome: Beliefs about Occupational Fields (STEM)

(a) Parent Treatment



(b) Peer Treatment



Notes: Each marker is the coefficient of the *parent* (Panel a) or *peer* (Panel b) condition from a separate regression of the decision-relevant belief index about STEM on condition indicators, estimated separately for girls and boys, with the *private* condition as the reference category. The index averages over the three most relevant beliefs (*graduate*, *good at it*, *enjoy*), then standardizes using the mean and standard deviation of this index in the pooled *private* condition, so coefficients are in standard deviations. Four estimates are shown: with school-by-grade fixed effects only (circles), additionally controlling for the student's stated STEM aspiration (diamonds), for the student's interest in STEM on the 0–100 scale (triangles), and for both (squares). Aspiration and interest are themselves outcomes of the treatment, so the last three are a descriptive attenuation check rather than controlled direct effects. Heavy whiskers are 90% and thin whiskers 95% confidence intervals based on robust standard errors. The sample consists of students with complete beliefs about all four fields.

responsive to the same social cues that shape observed aspirations. Notably, this malleability is asymmetric across genders and conditions: girls' beliefs shift under both parental and peer observability, while boys' beliefs shift only under parental observability, mirroring the gender-specific patterns of perceived pressure on occupational aspirations documented above. This also lends support to the idea that the growing role of beliefs across grades could partly reflect the gradual internalization of socially transmitted signals, rather than beliefs formed independently of social context. Further support for this interpretation comes from a heterogeneity analysis by grade, revealing that the treatment effect is strongest in higher grades (see Figures A15 and A16).

An open question is whether beliefs change as a result of social pressure or whether they change to be consistent with an aspiration that has already been adjusted to perceived social pressure? Figure 6 speaks to this by adding students' stated STEM aspiration and their continuous STEM interest rating to the specification. Both are themselves outcomes of the treatment, so these estimates are not causal effects net of aspirations, but we read them purely as a descriptive attenuation check.

The treatment effect on the decision-relevant belief index falls in magnitude from 0.157 to 0.068 for boys and from -0.103 to -0.019 for girls (Table A13), so that between 57% and 82% of the movement in exactly those beliefs that drive the choice can be accounted for by the shifted aspiration and interest score. Individual items behave the same way, with attenuation of roughly 50% for boys' enjoyment and performance beliefs and 60-80% for girls' expectations of graduating, being good at it and feeling comfortable. Other beliefs, by contrast, remain unchanged. Notably, these are precisely the beliefs that carry no weight in the choice model, and that therefore could not plausibly have been reported to rationalize the stated choice.

Summarizing these results, two distinct processes appear to operate. Part of the belief response to observability looks like consistency-seeking: students who have adjusted their stated aspiration and interest under social observability report the beliefs about performance and enjoyment that would justify these. The reduction in girls' expressed concern about prejudice, in contrast, survives the aspiration control and looks like a genuine priming effect.

Implications for the Interpretation of Beliefs: The endogeneity of subjective beliefs has so far only been discussed with respect to respondents' underlying preferences (Patnaik, Wiswall and Zafar, 2021): students who prefer a field report more favorable beliefs about it. Our results point to a more troubling version of the same problem. In our setting, beliefs align with an aspiration that has itself been shaped by perceived social pressure. Belief elicited for socially influenced choices may therefore encode the perceived expectations

and norms of the student's social environment rather than the student's own assessment. Because the resulting beliefs are internally coherent and predict the observed choice well, this contamination is essentially invisible in the cross-section. The apparent explanatory power of beliefs for educational and occupational choices and aspirations may thus in part reflect their endogeneity to choices and aspirations that social context has already shaped.

These findings connect to a growing literature showing that beliefs follow choices rather than only preceding them (Hartzmark, Hirshman and Imas, 2021; Gödker, Jiao and Smeets, 2025; Hajdu and Krusper, 2025). Related evidence shows that people even misremember their own past aspirations in the direction of what they ended up doing (Müller, 2022). Our setting adds a step before any of this: beliefs already bend toward a *stated* aspiration, elicited minutes earlier under social observability, long before a choice has been made or an outcome observed.

5 Conclusion

This paper investigates the role of perceived parental and peer pressure in shaping occupational aspirations and contributing to the persistent gender gap in STEM. Using a large-scale field experiment among secondary school students in Germany that exogenously varies the visibility of students' aspirations to parents and peers, we find that both girls and boys adjust their choices in line with gender-stereotypical expectations when under social scrutiny. As early as sixth grade, perceived parental pressure significantly pushes girls away from STEM (and to a lesser degree also peer pressure), while boys increasingly move toward STEM, especially in response to parental visibility. As a result, the gender gap in STEM aspirations nearly doubles when students' plans are made visible to their parents and increases substantially under peer visibility.

To better understand the broader mechanisms behind students' occupational aspirations and their relative importance, we complement the experimental evidence with a structural choice model that incorporates students' tastes and beliefs about occupational fields. While gender differences in tastes do not play a meaningful role, we find that gender differences in beliefs about occupational fields, particularly girls' greater pessimism about succeeding in and enjoying STEM careers, contribute to the STEM gender gap to a similar extent as perceived parental pressure, and roughly twice as much as peer pressure. Perceived external pressures, especially from parents, appear to be the dominant force in earlier grades, whereas beliefs gain importance over time. This dynamic suggests that external influences not only shape aspirations directly, but may also internalize into students' beliefs, reinforcing gendered trajectories over time. This interpretation is supported by further evidence that beliefs shift

when students are prompted to discuss their aspirations with parents or peers.

Our study advances our understanding of the role of social pressure in shaping occupational aspirations. This evidence carries direct implications for the design of interventions aimed at closing the STEM gender gap. Existing interventions have largely focused on role-model programs (Porter and Serra, 2020; Canaan and Mouganie, 2021; Breda et al., 2023) and initiatives directly targeting girls' interest in and confidence about STEM (Berkowitz et al., 2015; Escueta et al., 2020; Grosch, Haeckl and Kocher, 2026). Our results suggest that such interventions may be more effective if they explicitly account for the role of perceived parental and peer expectations. Both by targeting parents and peers directly and by timing interventions early, before social influences become internalized. Beyond intervention design, our findings carry broader implications for individual welfare. If career choices systematically reflect perceived social pressures, this may limit individuals' control over their own professional trajectories and undermines self-determination – a cornerstone of intrinsic motivation and well-being (Ryan and Deci, 2000; Fehr, Herz and Wilkening, 2013).

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A Figures and Tables

Table A1: Experimental Balance by Gender: Grade-Level 6

	Girls					Boys				
	Private	Parent	*Par. vs. Priv. (p-value)*	Peer	*Peer vs. Priv. (p-value)*	Private	Parent	*Par. vs. Priv. (p-value)*	Peer	*Peer vs. Priv. (p-value)*
Socio-Demographic Variables										
At least 1 parent with Abitur	0.17	0.20	0.737	0.24	0.351	0.24	0.24	0.990	0.20	0.604
Residing with mother	0.97	0.99	0.336	0.97	0.841	0.96	0.93	0.339	0.92	0.251
Residing with father	0.87	0.79	0.172	0.80	0.299	0.86	0.73	0.030	0.84	0.648
Number of siblings	1.39	1.40	0.930	1.43	0.807	1.38	1.63	0.220	1.85	0.069
Born in Germany	0.94	0.93	0.684	0.93	0.733	0.90	0.94	0.333	0.91	0.931
Migration background	0.33	0.35	0.828	0.39	0.503	0.36	0.34	0.818	0.34	0.839
Catholic	0.64	0.67	0.719	0.56	0.326	0.53	0.47	0.440	0.66	0.096
Protestant	0.15	0.13	0.775	0.20	0.400	0.20	0.16	0.586	0.16	0.569
Pre-Treatment Variables										
Thought about career plans (1–5)	3.05	3.28	0.052	3.38	0.004	3.19	3.08	0.373	3.04	0.246
Certainty about career plans (0–100)	49.98	50.36	0.922	51.09	0.769	54.00	50.26	0.339	51.09	0.518
Importance: Graduate	74.59	76.64	0.537	78.48	0.281	76.71	72.15	0.238	67.30	0.016
Importance: Good at it	78.91	80.40	0.590	86.01	0.008	79.57	80.15	0.841	79.03	0.857
Importance: Enjoy	84.45	82.47	0.497	87.94	0.215	83.29	78.56	0.147	80.60	0.371
Importance: Not too demanding	62.48	60.54	0.559	65.60	0.379	57.33	58.26	0.810	61.19	0.358
Importance: Enough money	88.33	92.57	0.047	88.51	0.944	91.52	90.00	0.511	90.18	0.604
Importance: Proud parents	77.84	78.07	0.954	80.94	0.433	84.29	81.24	0.360	75.51	0.020
Importance: Parents can help	61.54	63.77	0.580	62.28	0.853	60.80	59.79	0.806	55.81	0.239
Importance: Feel comfortable	87.17	90.20	0.167	91.77	0.039	86.82	83.36	0.171	84.09	0.290
Importance: Not facing prejudice	78.66	79.54	0.820	81.93	0.391	76.15	71.20	0.305	69.19	0.188
Importance: Good income	82.52	85.80	0.230	84.62	0.486	87.50	84.58	0.251	89.12	0.510
Importance: Help others	66.49	66.01	0.887	72.62	0.083	55.81	63.73	0.044	62.45	0.152
Importance: Help world	58.10	54.66	0.326	59.36	0.735	50.87	55.64	0.219	54.21	0.442
Importance: Work-life balance	86.72	85.58	0.668	85.52	0.674	84.63	84.33	0.924	82.47	0.503
Importance: Desirable status	37.45	50.23	0.005	37.73	0.950	50.07	53.65	0.455	52.49	0.635

Notes: p-values from heteroskedasticity-robust t-tests comparing each treatment condition to the private condition.

Table A2: Experimental Balance by Gender: Grade-Level 7

	Girls					Boys				
	Private	Parent	*Par. vs. Priv. (p-value)*	Peer	*Peer vs. Priv. (p-value)*	Private	Parent	*Par. vs. Priv. (p-value)*	Peer	*Peer vs. Priv. (p-value)*
Socio-Demographic Variables										
At least 1 parent with Abitur	0.32	0.21	0.063	0.31	0.897	0.32	0.20	0.056	0.22	0.146
Residing with mother	0.96	0.97	0.521	0.98	0.329	0.97	0.97	0.924	0.99	0.547
Residing with father	0.79	0.81	0.663	0.83	0.351	0.80	0.84	0.424	0.81	0.816
Number of siblings	1.41	1.48	0.594	1.31	0.429	1.49	1.44	0.714	1.36	0.376
Born in Germany	0.91	0.95	0.259	0.91	0.956	0.89	0.90	0.700	0.90	0.848
Migration background	0.34	0.32	0.710	0.33	0.740	0.33	0.32	0.879	0.34	0.863
Catholic	0.67	0.58	0.092	0.59	0.130	0.61	0.54	0.254	0.61	0.998
Protestant	0.18	0.23	0.315	0.22	0.398	0.16	0.22	0.167	0.15	0.897
Pre-Treatment Variables										
Thought about career plans (1–5)	3.31	3.17	0.117	3.29	0.823	3.16	2.99	0.086	3.10	0.602
Certainty about career plans (0–100)	48.59	43.79	0.100	48.80	0.941	54.75	49.16	0.086	46.86	0.020
Importance: Graduate	77.95	77.76	0.941	80.32	0.354	69.65	72.29	0.400	73.09	0.287
Importance: Good at it	81.91	81.01	0.654	82.47	0.777	82.00	79.70	0.311	84.51	0.231
Importance: Enjoy	85.57	84.62	0.657	84.38	0.581	82.50	83.93	0.556	81.07	0.585
Importance: Not too demanding	61.99	61.41	0.823	58.56	0.186	55.25	58.79	0.221	50.46	0.111
Importance: Enough money	93.82	89.12	0.005	90.64	0.030	87.73	89.73	0.343	90.82	0.133
Importance: Proud parents	74.61	70.96	0.254	74.12	0.868	77.24	76.85	0.902	76.93	0.924
Importance: Parents can help	57.34	54.78	0.402	53.56	0.206	54.40	55.22	0.798	57.58	0.359
Importance: Feel comfortable	87.53	86.43	0.564	87.08	0.810	84.81	84.20	0.793	86.49	0.464
Importance: Not facing prejudice	77.82	79.12	0.678	79.79	0.531	71.02	66.41	0.272	67.57	0.432
Importance: Good income	88.98	86.13	0.129	86.98	0.250	86.97	86.09	0.657	88.41	0.473
Importance: Help others	67.24	63.88	0.217	63.07	0.119	57.25	53.18	0.180	57.63	0.904
Importance: Help world	54.24	54.05	0.942	55.78	0.554	53.19	53.03	0.955	52.42	0.792
Importance: Work-life balance	85.69	83.84	0.356	86.40	0.703	83.03	84.74	0.490	83.27	0.928
Importance: Desirable status	42.04	41.46	0.858	43.70	0.591	45.92	50.31	0.235	47.07	0.766

Notes: p-values from heteroskedasticity-robust t-tests comparing each treatment condition to the private condition.

Table A3: Experimental Balance by Gender: Grade-Level 8

	Girls					Boys				
	Private	Parent	*Par. vs. Priv. (p-value)*	Peer	*Peer vs. Priv. (p-value)*	Private	Parent	*Par. vs. Priv. (p-value)*	Peer	*Peer vs. Priv. (p-value)*
Socio-Demographic Variables										
At least 1 parent with Abitur	0.25	0.30	0.456	0.31	0.329	0.24	0.23	0.985	0.34	0.116
Residing with mother	1.00	0.99	0.318	0.99	0.318	0.96	0.94	0.444	0.94	0.394
Residing with father	0.83	0.84	0.693	0.86	0.449	0.86	0.85	0.738	0.85	0.755
Number of siblings	1.45	1.63	0.241	1.39	0.714	1.53	1.64	0.462	1.35	0.112
Born in Germany	0.95	0.94	0.741	0.92	0.431	0.95	0.91	0.234	0.92	0.409
Migration background	0.29	0.29	0.929	0.32	0.636	0.28	0.32	0.448	0.36	0.170
Catholic	0.65	0.56	0.134	0.61	0.473	0.58	0.62	0.459	0.67	0.119
Protestant	0.25	0.26	0.840	0.20	0.333	0.28	0.19	0.105	0.20	0.161
Pre-Treatment Variables										
Thought about career plans (1–5)	3.55	3.47	0.370	3.63	0.401	3.08	3.31	0.034	3.35	0.012
Certainty about career plans (0–100)	51.96	52.68	0.817	53.57	0.616	51.89	51.21	0.852	57.17	0.155
Importance: Graduate	80.19	79.84	0.898	82.91	0.325	72.86	74.38	0.666	78.92	0.086
Importance: Good at it	87.30	86.89	0.826	86.04	0.513	81.63	83.21	0.462	88.00	0.001
Importance: Enjoy	89.51	86.26	0.122	89.31	0.912	82.47	83.07	0.802	85.90	0.152
Importance: Not too demanding	61.04	57.73	0.269	57.80	0.290	50.71	55.92	0.078	51.85	0.719
Importance: Enough money	91.61	92.35	0.662	88.92	0.167	90.06	94.22	0.013	91.56	0.465
Importance: Proud parents	73.97	70.97	0.359	71.67	0.478	72.98	75.09	0.533	74.40	0.687
Importance: Parents can help	54.26	51.55	0.410	49.54	0.157	49.23	54.66	0.093	49.27	0.988
Importance: Feel comfortable	90.47	88.11	0.237	90.65	0.911	85.39	87.49	0.271	87.39	0.346
Importance: Not facing prejudice	82.50	75.63	0.045	81.74	0.806	61.51	69.34	0.073	57.79	0.430
Importance: Good income	88.30	88.59	0.885	85.09	0.139	88.79	87.26	0.410	86.35	0.230
Importance: Help others	66.40	65.53	0.772	65.50	0.766	50.95	53.20	0.473	55.28	0.186
Importance: Help world	53.70	53.05	0.822	49.53	0.151	47.18	50.76	0.260	50.55	0.303
Importance: Work-life balance	83.31	84.07	0.763	84.72	0.562	83.50	85.89	0.278	84.13	0.808
Importance: Desirable status	41.60	38.20	0.329	36.01	0.095	38.24	42.25	0.291	41.73	0.384

Notes: p-values from heteroskedasticity-robust t-tests comparing each treatment condition to the private condition.

Table A4: Experimental Balance by Gender: Grade-Level 9

	Girls					Boys				
	Private	Parent	*Par. vs. Priv. (p-value)*	Peer	*Peer vs. Priv. (p-value)*	Private	Parent	*Par. vs. Priv. (p-value)*	Peer	*Peer vs. Priv. (p-value)*
Socio-Demographic Variables										
At least 1 parent with Abitur	0.42	0.26	0.018	0.34	0.232	0.30	0.19	0.092	0.30	0.941
Residing with mother	0.97	0.97	0.681	1.00	0.081	0.97	0.95	0.502	0.98	0.418
Residing with father	0.87	0.79	0.068	0.88	0.925	0.90	0.89	0.760	0.88	0.696
Number of siblings	1.53	1.47	0.588	1.57	0.822	1.52	1.34	0.167	1.35	0.251
Born in Germany	0.96	0.96	0.950	0.93	0.417	0.95	0.97	0.303	0.94	0.837
Migration background	0.31	0.27	0.459	0.36	0.400	0.33	0.21	0.056	0.29	0.490
Catholic	0.69	0.70	0.919	0.65	0.468	0.62	0.60	0.862	0.64	0.729
Protestant	0.19	0.20	0.853	0.22	0.561	0.23	0.28	0.380	0.22	0.894
Pre-Treatment Variables										
Thought about career plans (1–5)	3.83	3.84	0.981	3.70	0.128	3.47	3.61	0.201	3.53	0.561
Certainty about career plans (0–100)	61.07	62.12	0.764	60.02	0.765	66.21	63.57	0.452	66.78	0.869
Importance: Graduate	92.92	88.68	0.039	88.49	0.025	87.93	83.23	0.101	85.34	0.345
Importance: Good at it	89.54	90.14	0.687	90.34	0.591	88.73	85.43	0.076	85.02	0.044
Importance: Enjoy	89.46	91.71	0.146	90.74	0.424	85.89	87.24	0.533	88.80	0.172
Importance: Not too demanding	58.34	61.78	0.193	58.11	0.933	54.16	52.80	0.688	55.20	0.754
Importance: Enough money	92.98	92.08	0.548	92.25	0.633	90.71	93.21	0.144	91.77	0.550
Importance: Proud parents	73.05	68.67	0.172	72.62	0.893	71.47	70.63	0.827	70.56	0.812
Importance: Parents can help	47.66	47.09	0.853	47.18	0.874	43.43	44.59	0.748	44.65	0.744
Importance: Feel comfortable	91.05	92.71	0.212	90.48	0.716	85.89	88.44	0.254	87.45	0.500
Importance: Not facing prejudice	78.81	79.16	0.913	78.33	0.884	62.85	58.22	0.334	55.32	0.097
Importance: Good income	89.50	89.76	0.880	88.22	0.464	87.62	89.57	0.292	87.44	0.931
Importance: Help others	61.93	65.61	0.235	62.86	0.773	51.70	52.04	0.928	51.22	0.895
Importance: Help world	49.51	51.31	0.541	51.89	0.411	49.30	53.38	0.254	49.18	0.971
Importance: Work-life balance	89.15	87.10	0.303	87.31	0.328	85.66	83.90	0.432	83.19	0.264
Importance: Desirable status	33.72	38.56	0.158	42.20	0.015	42.25	40.14	0.619	42.64	0.926

Notes: p-values from heteroskedasticity-robust t-tests comparing each treatment condition to the private condition.

Table A5: Experimental results – Outcome: "Business"

	DV: Aspires to Business					
	All		Girls		Boys	
	(1)	(2)	(3)	(4)	(5)	(6)
Male	-0.059**	-0.064**				
	(0.030)	(0.031)				
Parent Condition	-0.027	-0.024	-0.027	-0.016	-0.024	-0.021
	(0.029)	(0.029)	(0.029)	(0.030)	(0.028)	(0.029)
Male X *Parent*	0.003	0.007				
	(0.040)	(0.041)				
Peer Condition	0.035	0.033	0.035	0.037	-0.022	-0.031
	(0.030)	(0.030)	(0.030)	(0.030)	(0.029)	(0.029)
Male X *Peer*	-0.057	-0.064				
	(0.041)	(0.042)				
Share Omitted Cat.	0.301	0.301	0.301	0.301	0.242	0.242
School x Grade FE	-	✓	-	✓	-	✓
Observations	2,840	2,840	1,501	1,501	1,339	1,339
R^2	0.010	0.031	0.003	0.044	0.001	0.040

Notes: Each column reports the results of a different regression, for the whole sample (columns 1-2), girls (columns 3-4), and boys (columns 5-6). Column (1), (3) and (5) report the raw comparison, columns (2), (4) and (6) add school-by-grade fixed effects. Share Omitted Cat. is the share aspiring to the field among girls (columns 1-4) or boys (columns 5-6) in the *private* condition. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table A6: Experimental results – Outcome: "Services"

	DV: Aspires to Services					
	All		Girls		Boys	
	(1)	(2)	(3)	(4)	(5)	(6)
Male	-0.325***	-0.333***				
	(0.030)	(0.031)				
Parent Condition	0.048	0.048	0.048	0.045	-0.005	-0.019
	(0.032)	(0.032)	(0.032)	(0.032)	(0.026)	(0.026)
Male X *Parent*	-0.053	-0.071*				
	(0.041)	(0.041)				
Peer Condition	0.009	0.006	0.009	0.004	-0.014	-0.010
	(0.032)	(0.032)	(0.032)	(0.032)	(0.026)	(0.026)
Male X *Peer*	-0.022	-0.017				
	(0.041)	(0.041)				
Share Omitted Cat.	0.512	0.512	0.512	0.512	0.187	0.187
School x Grade FE	-	✓	-	✓	-	✓
Observations	2,840	2,840	1,501	1,501	1,339	1,339
R^2	0.133	0.160	0.002	0.056	0.000	0.050

Notes: Each column reports the results of a different regression, for the whole sample (columns 1-2), girls (columns 3-4), and boys (columns 5-6). Column (1), (3) and (5) report the raw comparison, columns (2), (4) and (6) add school-by-grade fixed effects. Share Omitted Cat. is the share aspiring to the field among girls (columns 1-4) or boys (columns 5-6) in the *private* condition. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table A7: Experimental results – Outcome: "Construction"

	DV: Aspires to Construction					
	All		Girls		Boys	
	(1)	(2)	(3)	(4)	(5)	(6)
Male	0.231***	0.230***				
	(0.025)	(0.025)				
Parent Condition	0.015	0.016	0.015	0.011	-0.051*	-0.040
	(0.016)	(0.017)	(0.016)	(0.017)	(0.030)	(0.031)
Male X *Parent*	-0.066*	-0.059*				
	(0.034)	(0.034)				
Peer Condition	0.000	0.001	0.000	-0.001	0.018	0.031
	(0.016)	(0.016)	(0.016)	(0.016)	(0.031)	(0.032)
Male X *Peer*	0.018	0.026				
	(0.035)	(0.035)				
Share Omitted Cat.	0.064	0.064	0.064	0.064	0.295	0.295
School x Grade FE	-	✓	-	✓	-	✓
Observations	2,840	2,840	1,501	1,501	1,339	1,339
R^2	0.085	0.107	0.001	0.046	0.004	0.041

Notes: Each column reports the results of a different regression, for the whole sample (columns 1-2), girls (columns 3-4), and boys (columns 5-6). Column (1), (3) and (5) report the raw comparison, columns (2), (4) and (6) add school-by-grade fixed effects. Share Omitted Cat. is the share aspiring to the field among girls (columns 1-4) or boys (columns 5-6) in the *private* condition. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table A8: Experimental results – Outcome: "STEM" Rating

	DV: Rating of STEM (0 (worst) to 100 (best))					
	All		Girls		Boys	
	(1)	(2)	(3)	(4)	(5)	(6)
Male	16.236***	17.580***				
	(2.064)	(2.124)				
Parent Condition	-5.456***	-5.188***	-5.456***	-4.968**	4.386**	5.368**
	(1.923)	(1.923)	(1.922)	(1.958)	(2.085)	(2.154)
Male X *Parent*	9.842***	10.498***				
	(2.836)	(2.844)				
Peer Condition	-4.376**	-3.840**	-4.376**	-3.955**	1.700	1.291
	(1.952)	(1.945)	(1.952)	(1.962)	(2.074)	(2.103)
Male X *Peer*	6.076**	5.440*				
	(2.848)	(2.837)				
Constant	42.217***	43.320***	42.217***	53.900***	58.453***	54.560***
	(1.397)	(5.140)	(1.397)	(6.356)	(1.520)	(6.719)
Mean Omitted Cat.	42.217	42.217	42.217	42.217	58.453	58.453
School x Grade FE	-	✓	-	✓	-	✓
Observations	2,840	2,840	1,501	1,501	1,339	1,339
R^2	0.116	0.145	0.006	0.055	0.003	0.050

Notes: Each column reports the results of a different regression, for the whole sample (columns 1-2), girls (columns 3-4), and boys (columns 5-6). The dependent variable is the student's interest in the field on a 0–100 scale. Columns (1), (3) and (5) report the raw comparison, columns (2), (4) and (6) add school-by-grade fixed effects. Mean Omitted Cat. is the mean rating among girls (columns 1-4) or boys (columns 5-6) in the *private* condition. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table A9: Experimental results – Outcome: "Business" Rating

	DV: Rating of Business (0 (worst) to 100 (best))					
	All		Girls		Boys	
	(1)	(2)	(3)	(4)	(5)	(6)
Male	-8.232***	-9.004***				
	(2.045)	(2.114)				
Parent Condition	-1.224	-0.552	-1.224	-0.216	-1.543	-0.795
	(1.811)	(1.835)	(1.811)	(1.862)	(2.092)	(2.138)
Male X *Parent*	-0.319	0.033				
	(2.767)	(2.780)				
Peer Condition	1.282	1.546	1.282	1.594	-0.791	-1.207
	(1.867)	(1.868)	(1.867)	(1.879)	(2.176)	(2.205)
Male X *Peer*	-2.073	-2.702				
	(2.867)	(2.868)				
Constant	59.020***	48.030***	59.020***	41.137***	50.789***	43.209***
	(1.322)	(4.434)	(1.322)	(6.033)	(1.560)	(5.704)
Mean Omitted Cat.	59.020	59.020	59.020	59.020	50.789	50.789
School x Grade FE	-	✓	-	✓	-	✓
Observations	2,840	2,840	1,501	1,501	1,339	1,339
R^2	0.023	0.056	0.001	0.057	0.000	0.050

Notes: Each column reports the results of a different regression, for the whole sample (columns 1-2), girls (columns 3-4), and boys (columns 5-6). The dependent variable is the student's interest in the field on a 0–100 scale. Columns (1), (3) and (5) report the raw comparison, columns (2), (4) and (6) add school-by-grade fixed effects. Mean Omitted Cat. is the mean rating among girls (columns 1-4) or boys (columns 5-6) in the *private* condition. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table A10: Experimental results – Outcome: "Construction" Rating

	DV: Rating of Construction (0 (worst) to 100 (best))					
	All		Girls		Boys	
	(1)	(2)	(3)	(4)	(5)	(6)
Male	26.365***	27.445***				
	(2.085)	(2.153)				
Parent Condition	-1.669	-1.351	-1.669	-1.775	-4.027*	-2.858
	(1.788)	(1.791)	(1.788)	(1.819)	(2.209)	(2.279)
Male X *Parent*	-2.358	-1.628				
	(2.842)	(2.860)				
Peer Condition	-1.740	-1.651	-1.740	-1.726	-1.519	-1.141
	(1.823)	(1.816)	(1.823)	(1.822)	(2.268)	(2.313)
Male X *Peer*	0.221	0.564				
	(2.910)	(2.916)				
Constant	27.465***	22.963***	27.465***	23.061***	53.830***	50.372***
	(1.289)	(5.620)	(1.289)	(8.250)	(1.639)	(7.440)
Mean Omitted Cat.	27.465	27.465	27.465	27.465	53.830	53.830
School x Grade FE	-	✓	-	✓	-	✓
Observations	2,840	2,840	1,501	1,501	1,339	1,339
R^2	0.149	0.173	0.001	0.052	0.003	0.045

Notes: Each column reports the results of a different regression, for the whole sample (columns 1-2), girls (columns 3-4), and boys (columns 5-6). The dependent variable is the student's interest in the field on a 0–100 scale. Columns (1), (3) and (5) report the raw comparison, columns (2), (4) and (6) add school-by-grade fixed effects. Mean Omitted Cat. is the mean rating among girls (columns 1-4) or boys (columns 5-6) in the *private* condition. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table A11: Experimental results – Outcome: "Services" Rating

	DV: Rating of Services (0 (worst) to 100 (best))					
	All		Girls		Boys	
	(1)	(2)	(3)	(4)	(5)	(6)
Male	-23.794***	-23.641***				
	(1.954)	(2.029)				
Parent Condition	0.567	1.141	0.567	0.947	-2.237	-2.464
	(1.750)	(1.767)	(1.750)	(1.791)	(2.074)	(2.090)
Male X *Parent*	-2.804	-3.952				
	(2.714)	(2.711)				
Peer Condition	1.715	1.810	1.715	1.720	-0.065	0.373
	(1.754)	(1.787)	(1.754)	(1.820)	(2.125)	(2.144)
Male X *Peer*	-1.780	-1.784				
	(2.756)	(2.772)				
Constant	69.170***	62.560***	69.170***	47.579***	45.376***	47.802***
	(1.247)	(5.398)	(1.247)	(7.411)	(1.504)	(6.515)
Mean Omitted Cat.	69.170	69.170	69.170	69.170	45.376	45.376
School x Grade FE	-	✓	-	✓	-	✓
Observations	2,840	2,840	1,501	1,501	1,339	1,339
R^2	0.158	0.184	0.001	0.046	0.001	0.056

Notes: Each column reports the results of a different regression, for the whole sample (columns 1-2), girls (columns 3-4), and boys (columns 5-6). The dependent variable is the student's interest in the field on a 0–100 scale. Columns (1), (3) and (5) report the raw comparison, columns (2), (4) and (6) add school-by-grade fixed effects. Mean Omitted Cat. is the mean rating among girls (columns 1-4) or boys (columns 5-6) in the *private* condition. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table A12: Experimental results across grade levels

	DV: Aspires to STEM							
	Grade Level 6		Grade Level 7		Grade Level 8		Grade Level 9	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Male	0.146**	0.170***	0.165***	0.188***	0.109**	0.107**	0.211***	0.215***
	(0.066)	(0.065)	(0.048)	(0.049)	(0.047)	(0.049)	(0.057)	(0.058)
Parent Condition	-0.133***	-0.144***	-0.009	-0.002	-0.059*	-0.064*	0.022	0.013
	(0.044)	(0.044)	(0.035)	(0.036)	(0.035)	(0.036)	(0.040)	(0.041)
Male X *Parent* Condition	0.100	0.127	0.106	0.097	0.179***	0.184***	0.065	0.084
	(0.085)	(0.084)	(0.067)	(0.068)	(0.067)	(0.068)	(0.078)	(0.080)
Peer Condition	-0.077	-0.078	-0.034	-0.026	-0.031	-0.029	-0.034	-0.037
	(0.051)	(0.052)	(0.033)	(0.033)	(0.038)	(0.038)	(0.036)	(0.036)
Male X *Peer* Condition	0.055	0.057	0.059	0.046	0.092	0.096	0.010	0.013
	(0.091)	(0.091)	(0.066)	(0.065)	(0.068)	(0.068)	(0.073)	(0.074)
Share Omitted Group (Girls *Private*)	0.178	0.178	0.107	0.107	0.112	0.112	0.107	0.107
Treatment *Parents*: Boys	-0.033	-0.017	0.096	0.095	0.120	0.120	0.086	0.097
(p-value)	0.653	0.816	0.093	0.098	0.034	0.036	0.198	0.166
Treatment *Peers*: Boys	-0.022	-0.021	0.024	0.020	0.062	0.067	-0.024	-0.024
(p-value)	0.770	0.779	0.672	0.723	0.270	0.238	0.704	0.712
School Fixed Effects	-	✓	-	✓	-	✓	-	✓
Observations	510	510	843	843	746	746	741	741

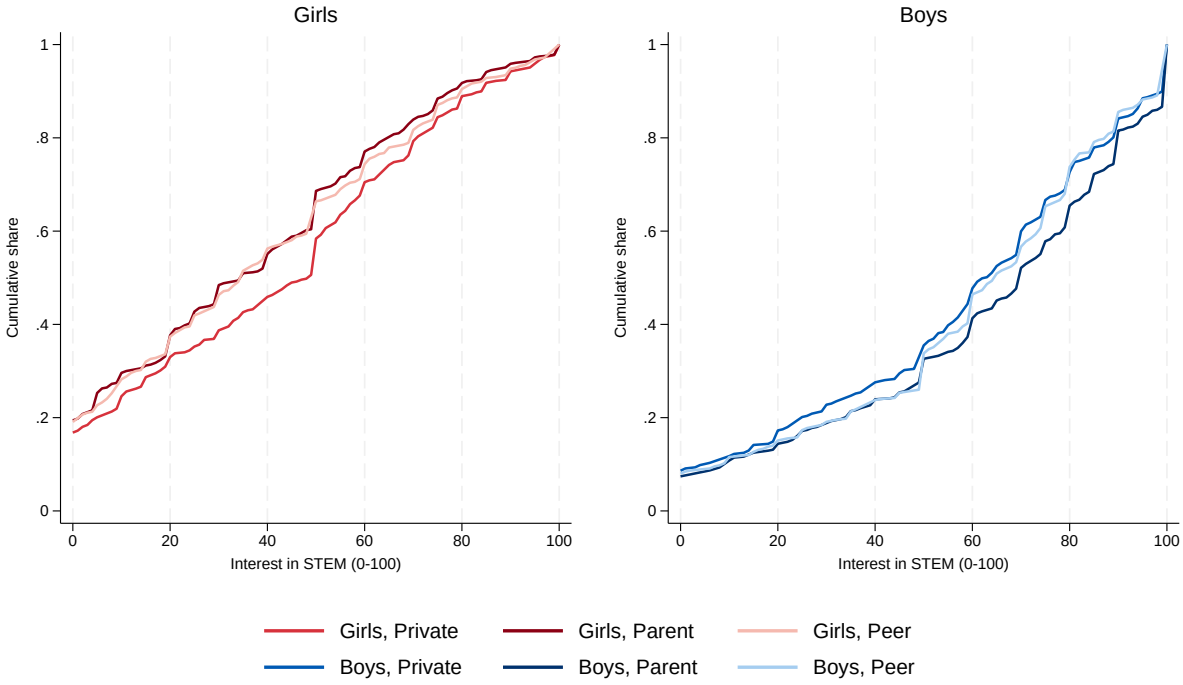
Notes: Each column reports the results of a different regression, for students in grade 6 (columns 1-2), grade 7 (columns 3-4), grade 8 (columns 5-6), and grade 9 (columns 7-8); even columns add school fixed effects. "Treatment *Parents*: Boys" is the sum of the *Parent* coefficient and its interaction with Male, with the *p*-value of the corresponding Wald test; analogously for peers. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table A13: Observability and Beliefs about STEM: The Belief Index

	(1)	(2)	(3)	(4)
Panel A: Girls				
Parent Condition	-0.103	-0.057	-0.025	-0.019
	(0.085)	(0.080)	(0.073)	(0.073)
Peer Condition	-0.070	-0.030	-0.015	-0.009
	(0.084)	(0.080)	(0.071)	(0.071)
Observations	1,044	1,044	1,044	1,044
Panel B: Boys				
Parent Condition	0.157**	0.093	0.073	0.068
	(0.064)	(0.059)	(0.052)	(0.052)
Peer Condition	0.009	0.011	-0.003	-0.002
	(0.067)	(0.063)	(0.057)	(0.056)
Observations	1,197	1,197	1,197	1,197
STEM aspiration control		✓		✓
STEM interest control			✓	✓
School x cohort fixed effects	✓	✓	✓	✓

Notes: The dependent variable is an index of the three beliefs that carry the largest weight in the choice model – the mean of the subjective probabilities of graduating, being good at the work and enjoying it – standardised on the mean and standard deviation of the *Private* condition, so that coefficients are in standard deviations. Each column reports one regression per panel on indicators for the *Parent* and *Peer* conditions, with the *Private* condition as the reference category, estimated separately for girls and boys. All columns include school by cohort fixed effects. Columns (2) to (4) add the student's stated STEM aspiration and/or their continuous STEM interest rating. Both are themselves outcomes of the treatment, so these columns do not identify a causal effect net of aspirations; they are reported as a descriptive check on whether the belief response is accounted for by the shift in stated aspirations. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

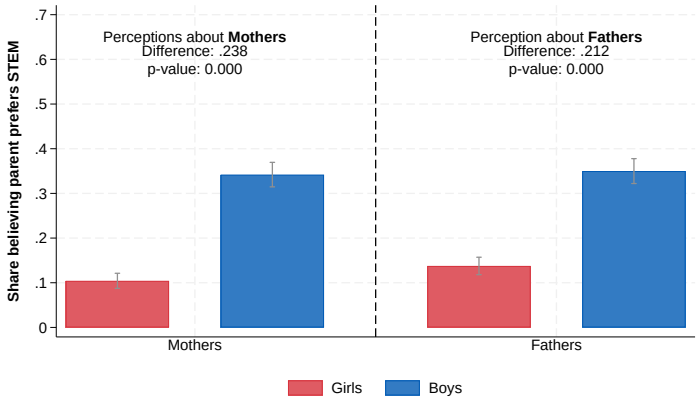
Figure A1: Distribution of interest in STEM by experimental condition



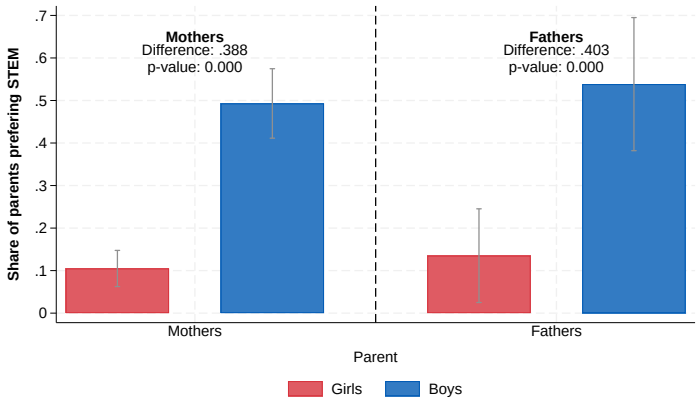
Notes: Cumulative distribution of students' interest in STEM (0–100) in the *private*, *parent*, and *peer* conditions, separately for girls and boys. Two-sample Kolmogorov–Smirnov tests reject equality of distributions against the private condition for girls in both the parent ($p = 0.011$) and the peer condition ($p = 0.009$) and for boys in the parent condition ($p = 0.028$), but not for boys in the peer condition ($p = 0.64$).

Figure A2: **Perceived** vs. **Actual** Parental STEM preferences

(a) **Perceived** parental preferences (by students)



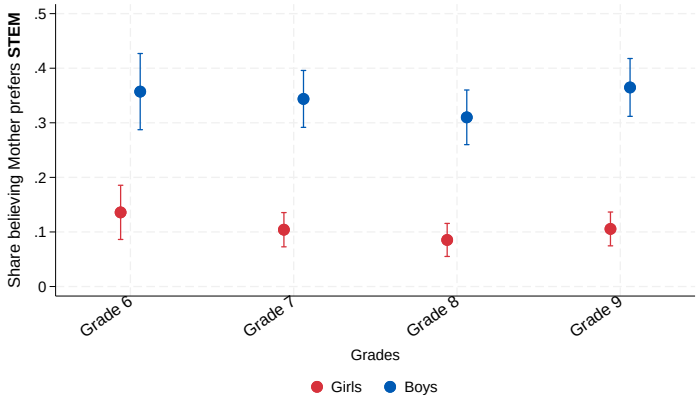
(b) **Actual** parental preferences (reported by parents)



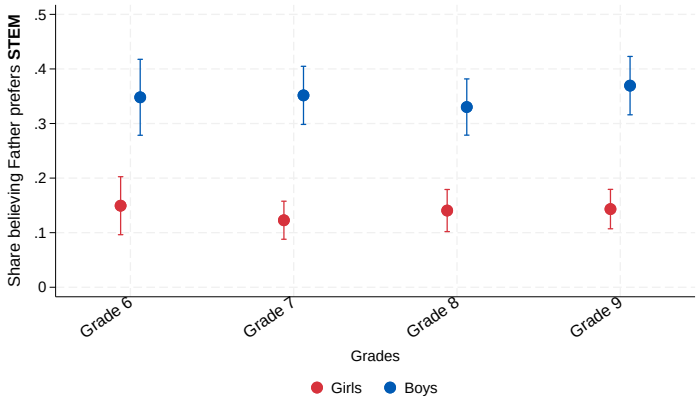
Notes: This figure presents the share of mothers and fathers aspiring to STEM for their daughters and sons (along with the respective 95 percent confidence intervals), as perceived by the students in Panel a and as reported by the participating parents in Panel b.

Figure A3: **Perceived** Parental STEM preferences across grade levels

(a) Mothers



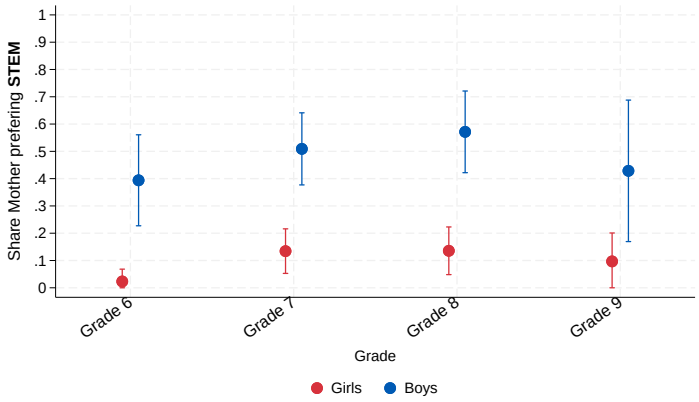
(b) Fathers



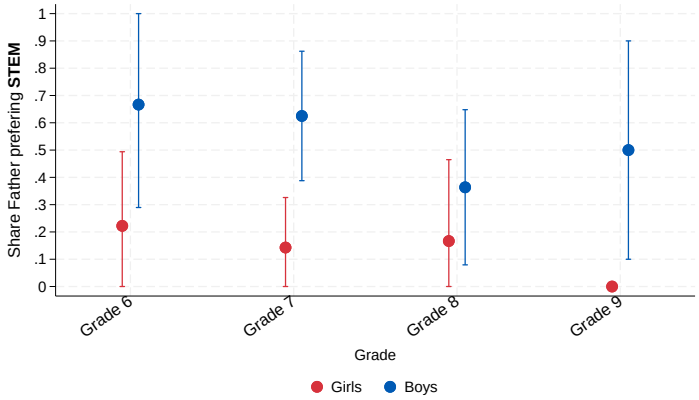
Notes: This figure presents the share and the respective 95 percent confidence intervals of mothers and fathers aspiring to STEM for their daughters and sons in grades 6, 7, 8, and 9, as perceived by the students.

Figure A4: **Actual** Parental STEM preferences across grade levels

(a) Mothers

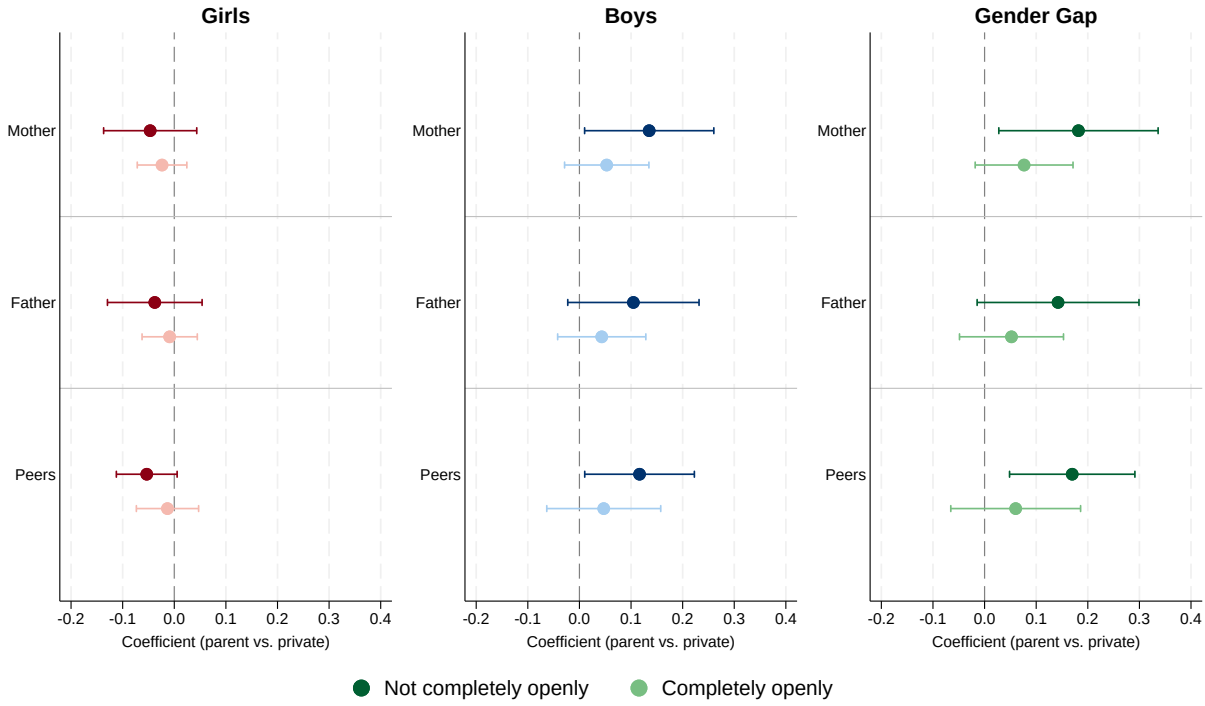


(b) Fathers



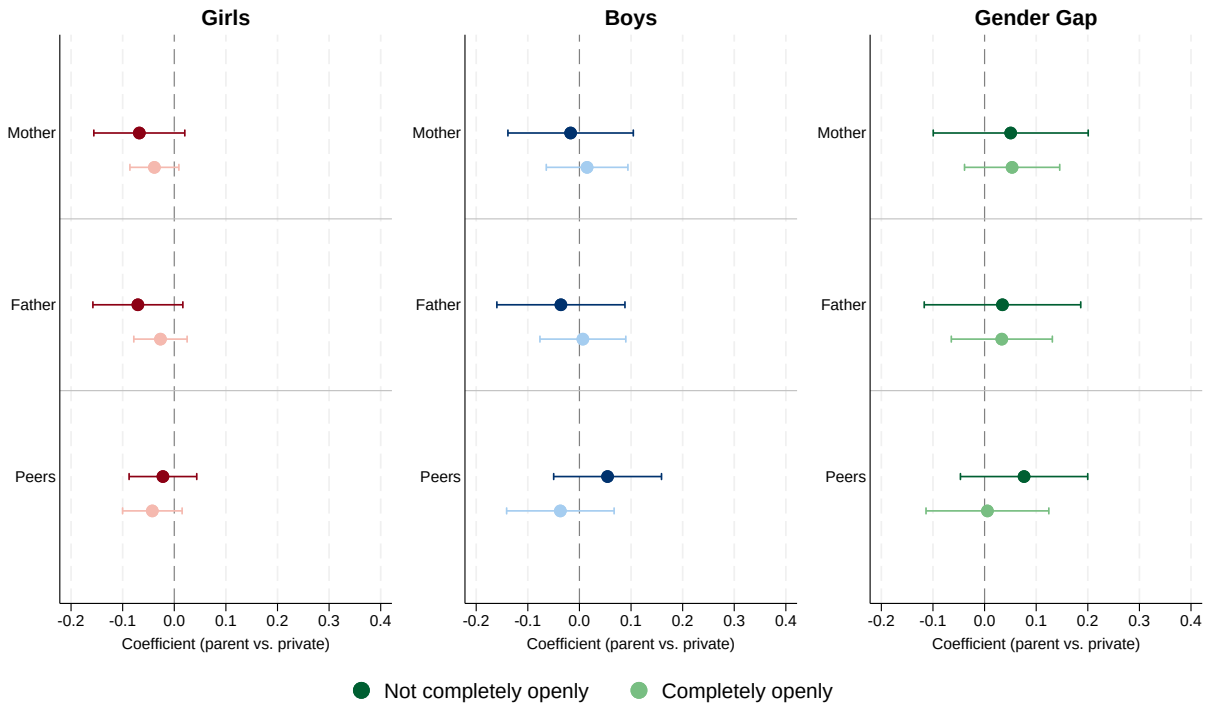
Notes: This figure presents the share (and 95 percent confidence intervals) of mothers and fathers aspiring to STEM for their daughters and sons in grades 6, 7, 8, and 9 – as reported by participating parents.

Figure A5: Treatment Effect Parent Condition by Talking openly vs. not talking openly



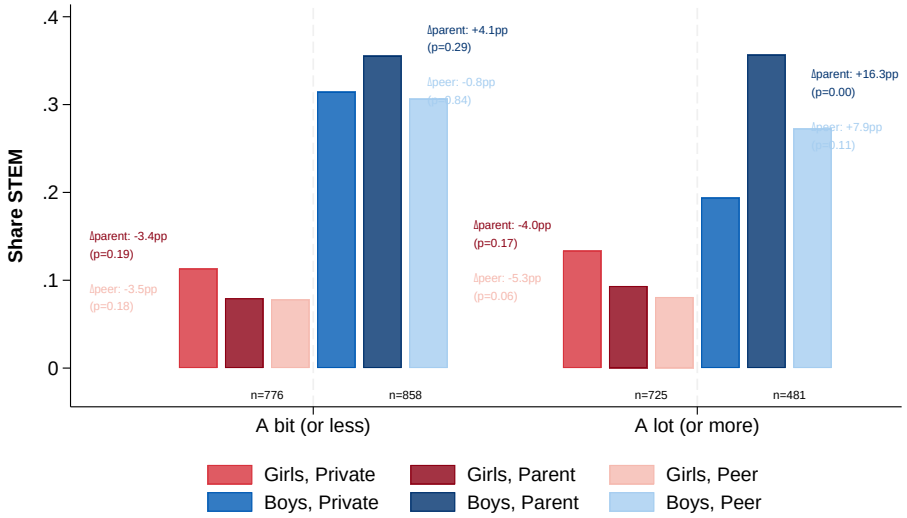
Notes: Each marker is the effect of the *parent* condition on the share aspiring to STEM, relative to the *private* condition, estimated separately for girls, boys, and the gender gap (interaction with the male indicator), and separately for students who report talking completely openly with the respective person about their career plans and students who do not. The three panels refer to talking with the mother, the father, and with friends. Bars are 95% confidence intervals based on robust standard errors. Differences between the two openness groups are not statistically significant at conventional levels.

Figure A6: Treatment Effect Peer Condition by Talking openly vs. not talking openly



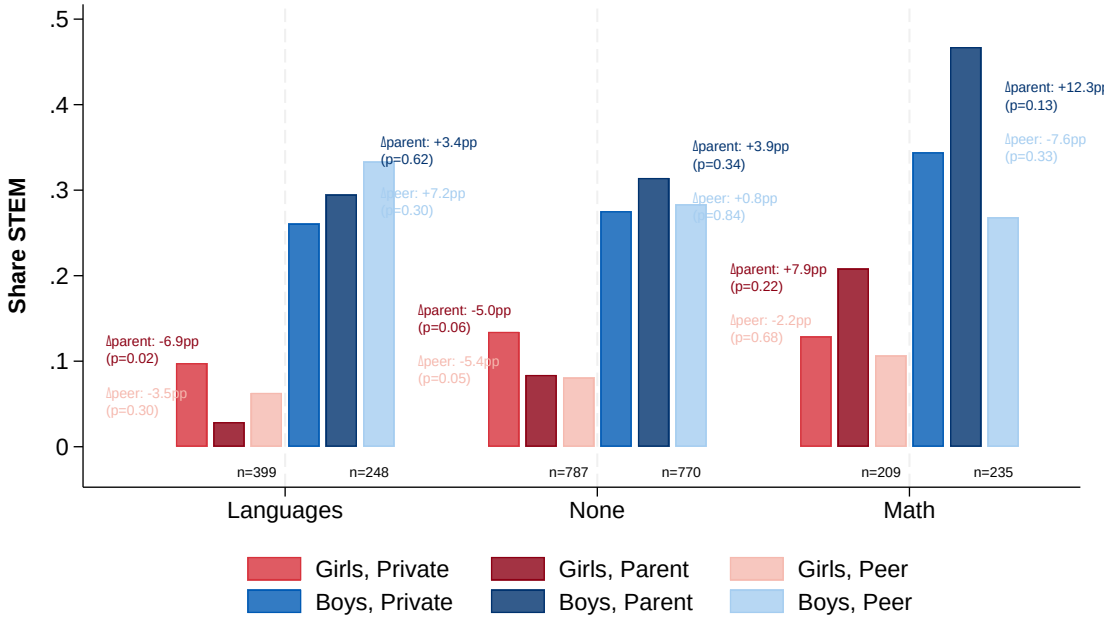
Notes: As Figure A5, for the effect of the *peer* condition relative to the *private* condition.

Figure A7: Treatment Effect by Intensity of Prior Reflection on Career Plans



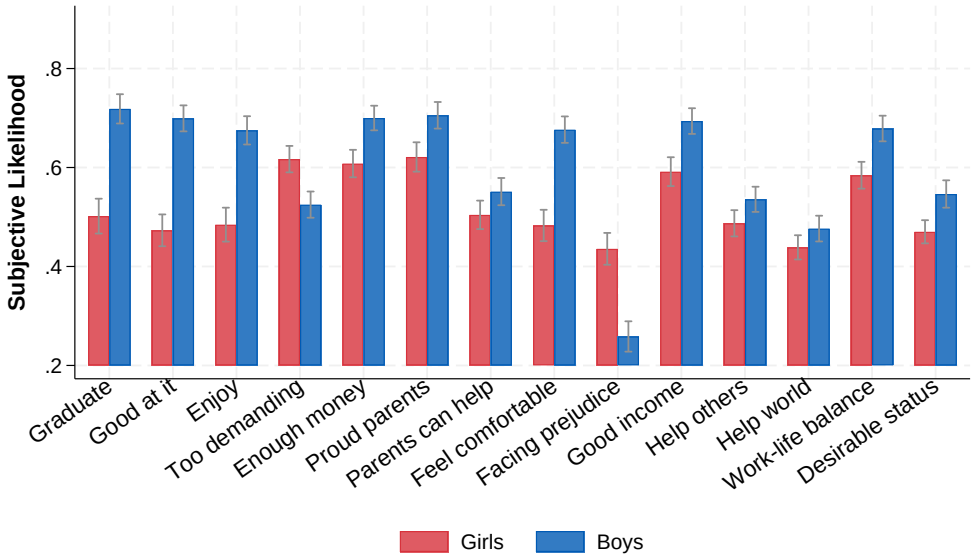
Notes: This figure presents the share of girls and boys aspiring to STEM in the *private*, *parent*, and *peer* conditions, separately for students who report having thought little about their career plans ("not at all", "hardly" or "somewhat") and students who report having thought a lot ("a lot" or "very thoroughly"). Whiskers are 95% confidence intervals. The annotations report the difference between the *parent* (*peer*) condition and the *private* condition in percentage points, with the p-value of a two-sided test of proportions; n is the number of students per group.

Figure A8: Comparative Advantage Math vs Languages



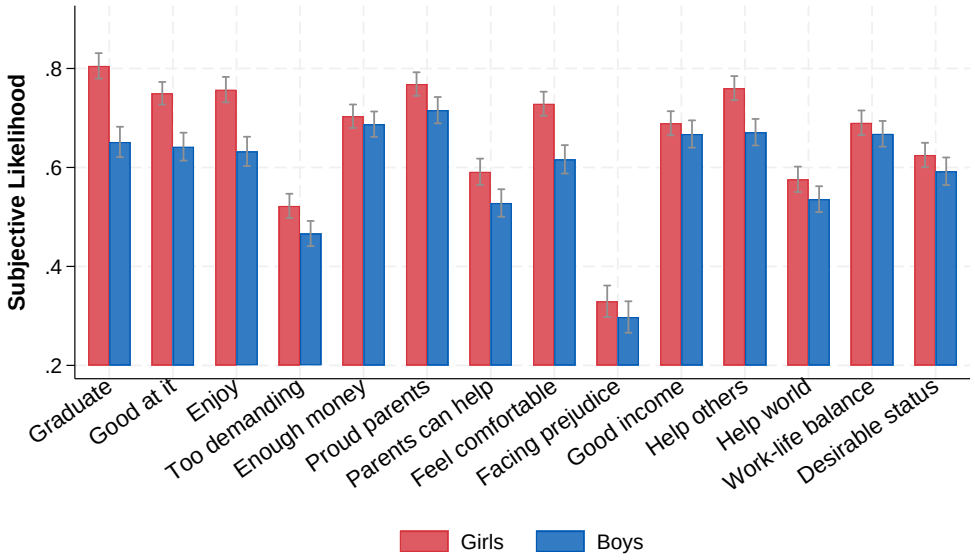
Notes: This figure presents the share of girls and boys aspiring to STEM in the *private*, *parent*, and *peer* conditions, separately for students with a comparative advantage in mathematics (a better self-reported grade in mathematics than in both German and English), in languages (a worse grade in mathematics than in both), and students with no clear advantage (all others). Whiskers are 95% confidence intervals. The annotations report the difference between the *parent* (*peer*) and the *private* condition in percentage points, with the p-value of a two-sided test of proportions; n is the number of students per group. Students who did not report all three grades are excluded.

Figure A9: Students' Beliefs about Construction



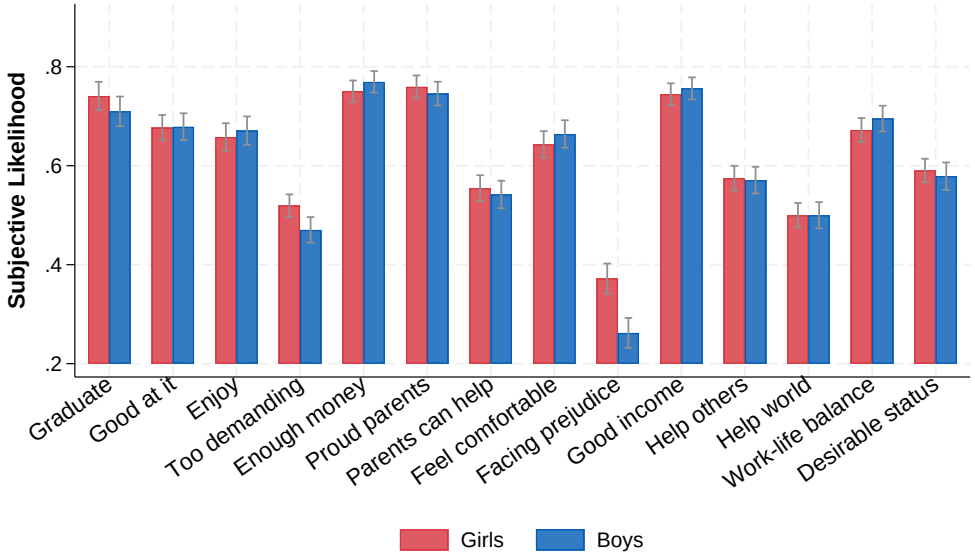
Notes: This graph shows the average subjective likelihood (and the 95%-confidence interval) for the 14 different career aspects for construction-related occupations for both girls and boys in the private condition.

Figure A10: Students' Beliefs about Services



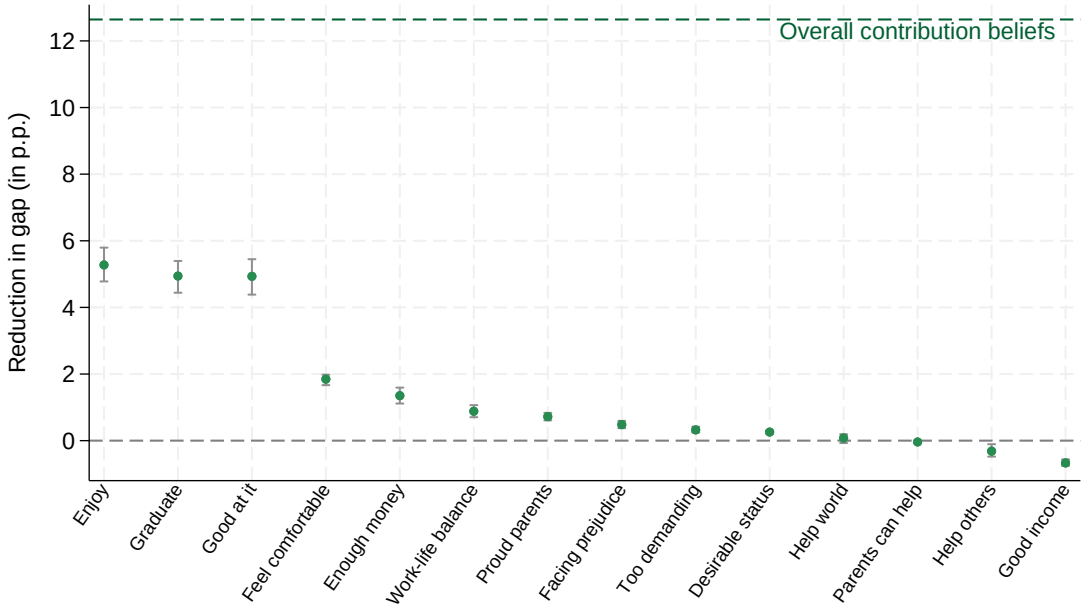
Notes: This graph shows the average subjective likelihood (and the 95%-confidence interval) for the 14 different career aspects for service-related occupations for both girls and boys in the private condition.

Figure A11: Students' Beliefs about Business-related Occupations



Notes: This graph shows the average subjective likelihood (and the 95%-confidence interval) for the 14 different career aspects for business-related occupations for both girls and boys in the private condition.

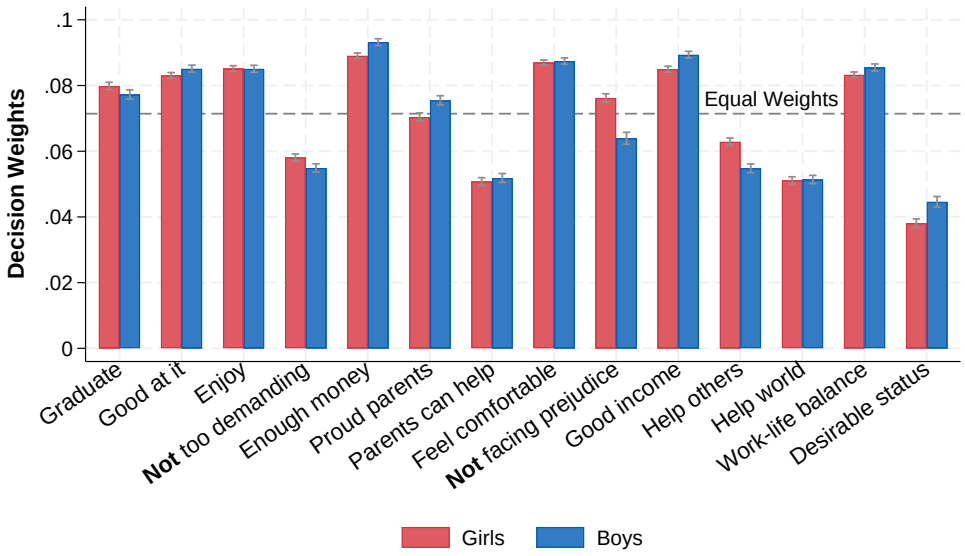
Figure A12: Contribution of individual beliefs to the gender gap in STEM aspirations



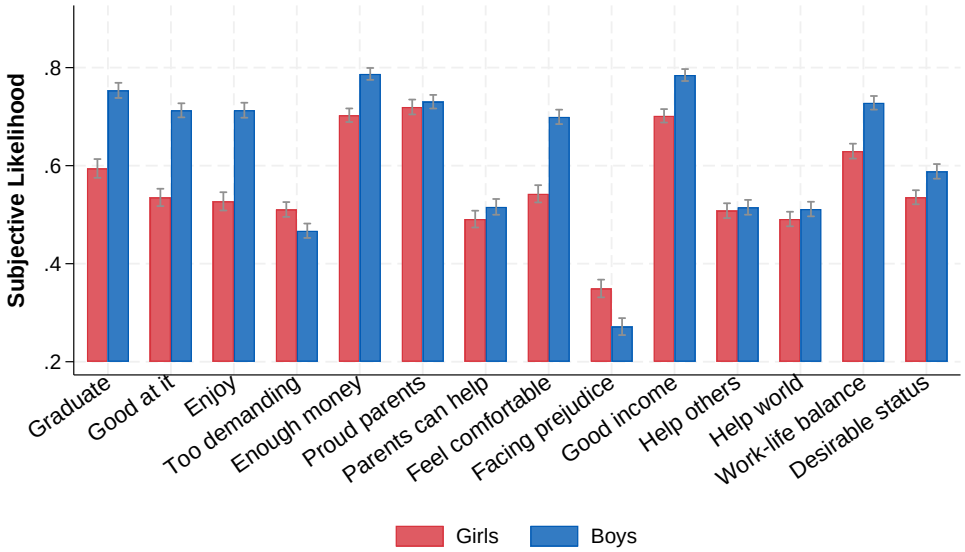
Notes: The figure shows how much of the gender gap in STEM choice in the *private* condition is closed when girls hold boys' beliefs about one belief category at a time. Field choice is modeled by a conditional logit of the chosen field on the fourteen beliefs about the four fields, estimated separately for girls and boys. In each of 200 replications, a random sample of boys of the same size as the sample of girls is drawn, girls and boys are ranked by their predicted probability of choosing STEM under their own gender's estimates, and the n-th ranked girl is matched to the n-th ranked boy. For one belief category at a time, each girl's beliefs about all four fields in that category are then replaced by those of her matched boy, while her remaining beliefs and the girls' utility weights are kept, and the girls' predicted share choosing STEM is recomputed. Markers are the resulting increase in the girls' predicted STEM share in percentage points, averaged over replications; whiskers delimit the 2.5th and 97.5th percentiles of the replications. Beliefs are ordered by the size of their contribution. The sample consists of students in the *private* condition who reported valid beliefs about all four fields. The dashed red line is the total contribution of beliefs according to the overall decomposition into utility weights, beliefs, and an unexplained component. The single-category contributions do not add up to the total contribution of beliefs (their sum exceeds it), because the choice model is non-linear; the ranking of categories is what the figure is meant to show.

Figure A13: Pooled Sample: Students' Tastes (Top) and Beliefs (Bottom) about Job Attributes

(a) Tastes



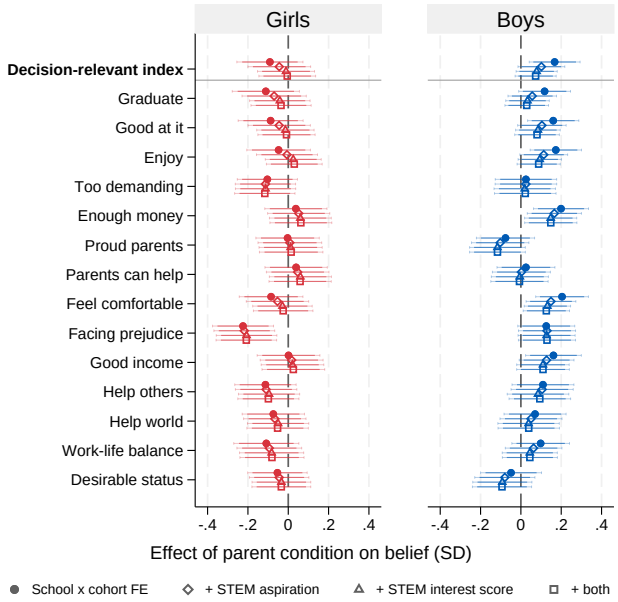
(b) Beliefs



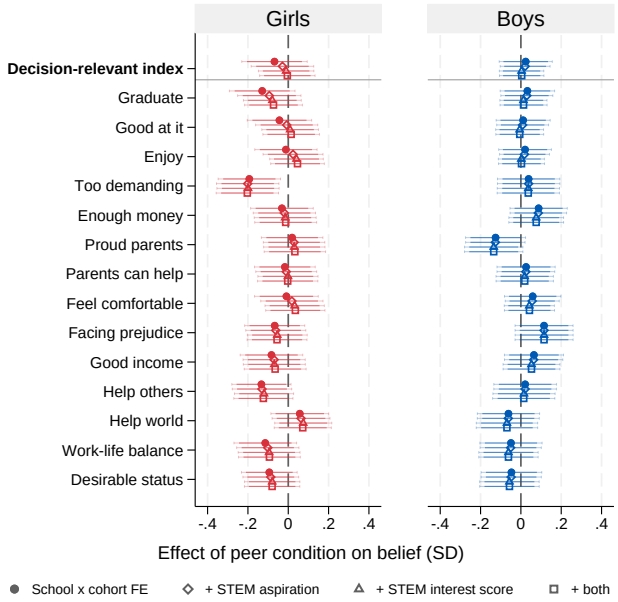
Notes: The graph at the top shows the average relative weight (and the 95%-confidence interval) put on each of the 14 different career aspects for both girls and boys when being asked how important these aspects are in their occupational choice. The dashed gray line indicates the relative weight if all aspects were weighted equally. The graph at the bottom shows the average subjective likelihood (and the 95%-confidence interval) for these 14 career aspects to materialize in STEM for both girls and boys. The likelihood varies between 0 and 1. Both sub-figures use the *pooled* sample.

Figure A14: Experimental Results – Outcome: Beliefs about Occupational Fields (STEM)

(a) Parent Treatment

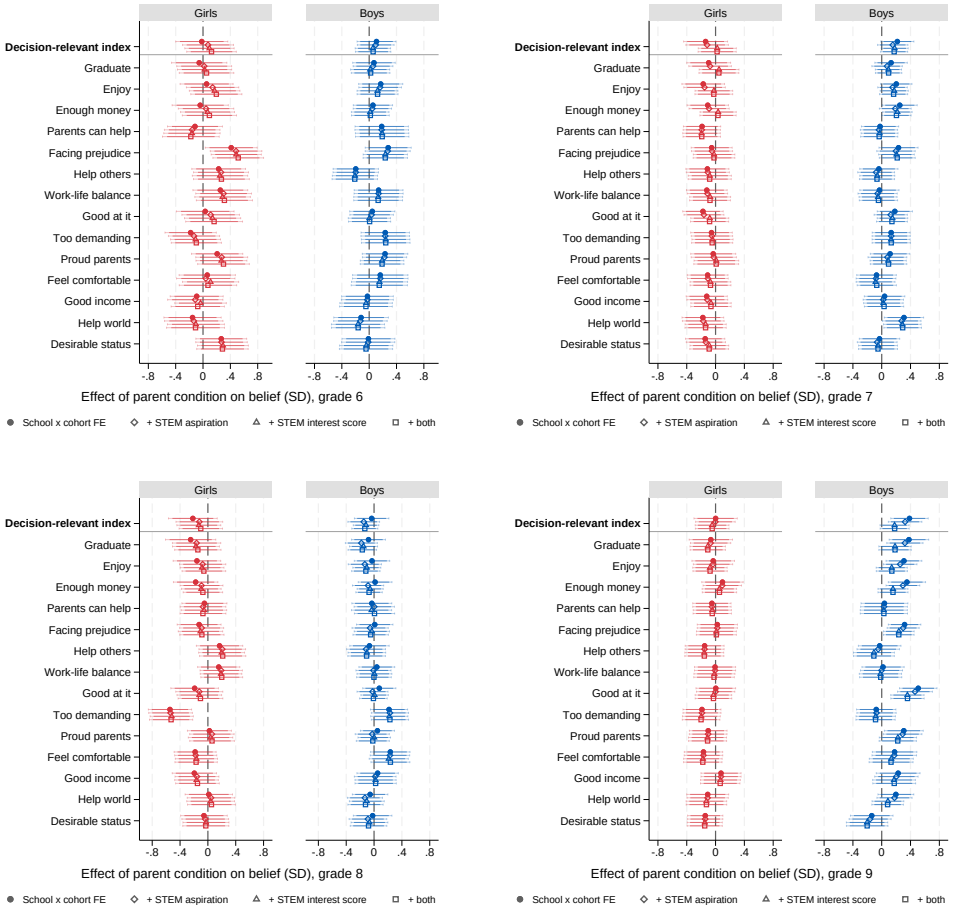


(b) Peer Treatment



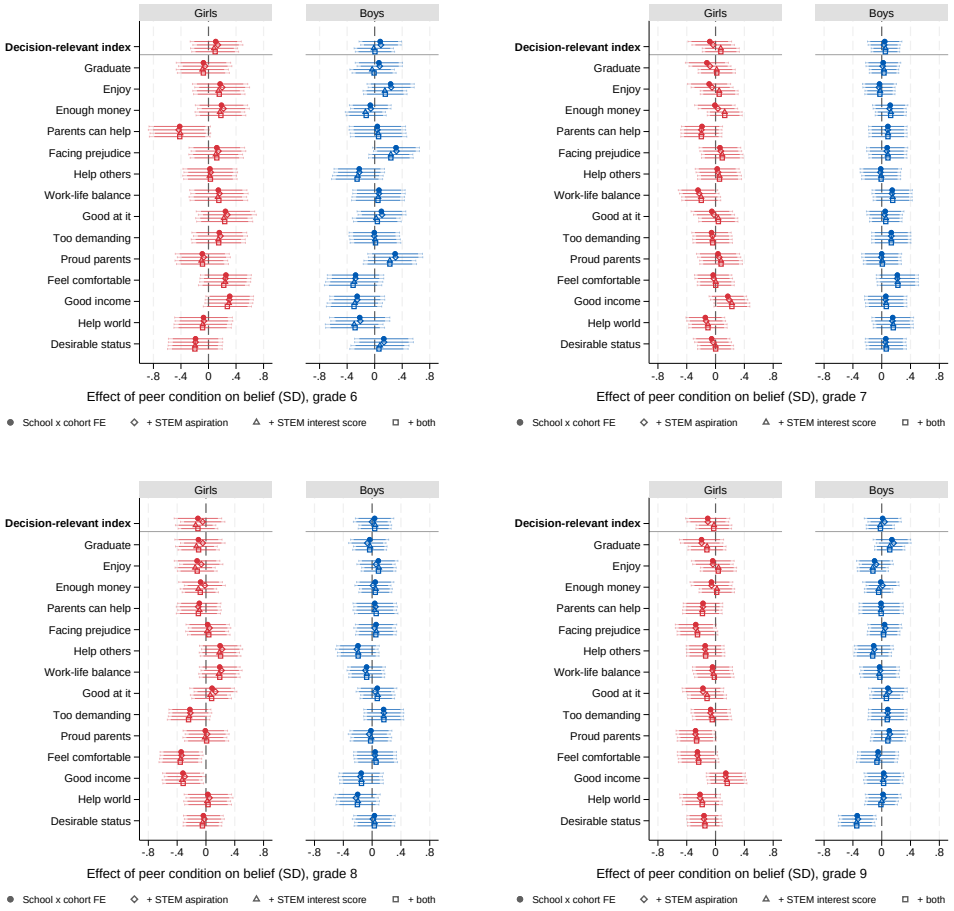
Notes: Each marker is the coefficient of the *parent* (Panel a) or *peer* (Panel b) condition from a separate regression of the respective belief about STEM on condition indicators, estimated separately for girls and boys, with the *private* condition as the reference category. Beliefs are standardized using the mean and standard deviation of the pooled *private* condition, so coefficients are in standard deviations. Four estimates are shown per belief: with school-by-grade fixed effects only (circles), additionally controlling for the student's stated STEM aspiration (diamonds), for the student's interest in STEM on the 0–100 scale (triangles), and for both (squares). Aspiration and interest are themselves outcomes of the treatment, so the last three are a descriptive attenuation check rather than controlled direct effects. Heavy whiskers are 90% and thin whiskers 95% confidence intervals based on robust standard errors. The sample consists of students with complete beliefs about all four fields.

Figure A15: Experimental Results (Parents) by Grade – Outcome: Beliefs about Occupational Field (STEM)



Notes: As Figure 6, Panel (a), estimated separately for students in grades 6, 7, 8, and 9 (one panel per grade, girls on the left and boys on the right). Each marker is the coefficient of the *parent* condition on the standardized belief about STEM, with the *private* condition as reference. Markers as in Figure 6: fixed effects only, plus stated STEM aspiration, plus interest in STEM, plus both. Heavy whiskers are 90% and thin whiskers 95% confidence intervals based on robust standard errors.

Figure A16: Experimental Results (Peers) by Grade – Outcome: Beliefs about Occupational Field (STEM)



Notes: As Figure 6, Panel (b), estimated separately for students in grades 6, 7, 8, and 9 (one panel per grade, girls on the left and boys on the right). Each marker is the coefficient of the *peer* condition on the standardized belief about STEM, with the *private* condition as reference. Markers as in Figure 6: fixed effects only, plus stated STEM aspiration, plus interest in STEM, plus both. Heavy whiskers are 90% and thin whiskers 95% confidence intervals based on robust standard errors.

B Choice Model

We assume that students s have following subjective expected utility SEU_{sj} from choosing a field j among the options "Construction" ($j = 1$), "Services" ($j = 2$), "Business" ($j = 3$), and "STEM" ($j = 4$), with ϵ_{sj} indicating factors students may care about that are unobserved by us:

$$SEU_{sj} = \sum_{k=1}^{K} [\pi_{sjk} u(b_k = 1, X_s) + (1 - \pi_{sjk}) u(b_k = 0, X_s)] + \epsilon_{sj} \tag{1}$$

Their expected utility depends on their subjective beliefs $\pi_{sj}(b_k = 1) \equiv \pi_{sjk}$ about k binary outcomes b with $b_1, b_2, ...b_k \in \{0, 1\}$ materializing for a given field (e.g., how likely they think they are to graduate if they were to choose training in STEM), and their utility $u(b_k = 1)$ from this outcome materializing (as well as their utility of this outcome not materializing, $u(b_k = 0)$).[21] This can be re-written as:

$$SEU_{sj} = \sum_{k=1}^{K} \pi_{sjk} \Delta u_k(X_s) + \sum_{k=1}^{K} u(b_k = 0)(X_s) + \epsilon_{sj} \tag{2}$$

$\Delta u_k(X_s)$ now has the interpretation of the difference in utility between outcome k materializing and not materializing, i.e., $u(b_k = 1) - u(b_k = 0) \equiv \Delta u_k$. For Δu_{enjoy} this would for example indicate the difference between enjoying vocational training in a field and not enjoying it.

We allow the utility differentials Δu_k to vary by gender (as for the results in Table A14 and for the overall decomposition in Figure 4 at the top) and by gender and grade level for the results in Table A15 and the decomposition by cohorts in Figure 4 at the bottom. We use our data on students' subjective beliefs to estimate the utility differentials. We estimate these components in a conditional logit model using maximum likelihood. The coefficients corresponding to the utility differentials (or utility weights) are presented in Tables A14 and A15, displaying the results separately by gender and by gender and grade levels respectively.

The components associated with the highest and statistically significant utility weights are graduating, being at good at it, enjoying the tasks, and feeling comfortable. It is also these aspects for which belief differences between girls and boys appear to contribute the most towards the gender gap in STEM aspirations, as simulations in Figure A12 suggest. The estimated utility weights are broadly consistent with the self-reported decision weights in Figure 3 in terms of above- and below-average weights, they are also overall comparable between girls and boys, and with some differences in estimated weights (in e.g., facing prejudice, work-life balance, or helping others).

B.1 Decomposition

Denoting the probability to aspire to STEM by $Pr_{\text{STEM}}(\pi_s \beta_g)$ as predicted by the estimated utility weights π_s, and estimated utility weights β_M for boys and β_F for girls, we can calculate the predicted gender gap in STEM aspirations as follows:

[21] We assume additive separability for the 14 binary outcomes.

$$\Delta_{\text{STEM}} = \underbrace{E[Pr_{\text{STEM}}(\pi_s \beta_M)|X_s = M] - E[Pr_{\text{STEM}}(\pi_s \beta_F)|X_s = F]}_{\text{Predicted Gap}} \tag{3}$$

We decompose the predicted gap into the two components of utility weights and beliefs by using counterfactual predictions: we assign the estimated utility weights for girls β_F to boys and calculate the average predicted likelihood to aspire to STEM, see $E[Pr_{\text{STEM}}(\pi_s \boldsymbol{\beta_F})|X_s = M]$ in Equation 4. This counterfactual prediction allows us to decompose the contribution of internal aspects into contributions by utility weights and beliefs.

$$\begin{aligned}\Delta^{Gender} = & \underbrace{E[Pr_{\text{STEM}}(\pi_s \boldsymbol{\beta_M})|X_s = M] - E[Pr_{\text{STEM}}(\pi_s \boldsymbol{\beta_F})|X_s = M]}_{\Delta^{\beta}\text{(Utility Weights)}} \\ & + \underbrace{E[Pr_{\text{STEM}}(\boldsymbol{\pi_s} \beta_F)|\boldsymbol{X_s = M}] - E[Pr_{\text{STEM}}(\boldsymbol{\pi_s} \beta_F|\boldsymbol{X_s = F}]}_{\Delta^{\pi}\text{(Beliefs)}}\end{aligned} \tag{4}$$

Table A14: Choice Model Estimates by Gender (Private Condition)

	Girls (1)	Boys (2)	Diff (2)-(1)
Graduate	3.130***	3.095***	-0.035
	(0.878)	(0.671)	(1.105)
Good at it	3.366***	2.474***	-0.893
	(1.015)	(0.794)	(1.289)
Enjoy	2.576***	1.871**	-0.706
	(0.879)	(0.727)	(1.140)
Too demanding	-0.700	-0.979**	-0.278
	(0.587)	(0.460)	(0.746)
Enough money	2.173**	-0.314	-2.487**
	(0.965)	(0.671)	(1.175)
Proud parents	0.926	1.267*	0.342
	(0.809)	(0.695)	(1.066)
Parents can help	-0.066	1.138**	1.205
	(0.594)	(0.478)	(0.763)
Feel comfortable	1.306	2.502***	1.196
	(0.843)	(0.649)	(1.064)
Facing prejudice	-1.020	0.811*	1.831**
	(0.624)	(0.493)	(0.795)
Good income	-0.879	0.598	1.477
	(0.854)	(0.720)	(1.117)
Help others	1.202**	-0.338	-1.540**
	(0.588)	(0.456)	(0.744)
Help world	-1.030	-1.060**	-0.029
	(0.697)	(0.510)	(0.863)
Work-life balance	1.866***	0.095	-1.770*
	(0.702)	(0.638)	(0.949)
Desirable status	0.475	0.313	-0.163
	(0.728)	(0.507)	(0.887)
Observations	1,356	1,484	

Notes: Conditional logit estimates of the choice between the four occupational fields, estimated on the *private* condition, for girls (column 1) and boys (column 2); column (3) reports the difference. Each regressor is the student's belief that the respective attribute materializes in a field, scaled 0 to 1, so a coefficient is the change in the utility of a field from moving a belief from "definitely not" to "definitely". Construction is the base alternative. Observations are student-alternative pairs. Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table A15: Choice Model Estimates by Gender and Grade Level (Private Condition)

	Grade 6		Grade 7		Grade 8		Grade 9	
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
Graduate	1.045	4.614**	8.736***	2.473*	3.343*	2.608**	-0.704	4.972**
	(1.804)	(1.983)	(2.786)	(1.269)	(1.760)	(1.199)	(2.566)	(2.248)
Good at it	2.645	1.957	9.038***	3.587**	1.677	3.270**	5.748**	1.898
	(2.586)	(1.867)	(2.538)	(1.584)	(2.311)	(1.412)	(2.346)	(2.903)
Enjoy	1.269	-0.468	0.552	1.851	2.242	1.804	11.379***	3.187
	(2.232)	(2.083)	(1.701)	(1.418)	(1.840)	(1.191)	(3.114)	(2.427)
Too demanding	-0.205	-1.454	-2.667*	-0.903	-1.474	-1.419	-0.449	-0.065
	(1.138)	(1.032)	(1.496)	(0.915)	(1.324)	(0.896)	(1.697)	(1.716)
Enough money	2.642	-2.838	5.883**	-0.436	2.083	1.132	0.123	-1.545
	(2.417)	(2.213)	(2.690)	(1.384)	(2.990)	(1.052)	(2.600)	(1.973)
Proud parents	0.637	3.267	0.389	2.186	-3.795*	-0.342	6.098**	0.131
	(1.693)	(2.343)	(2.182)	(1.502)	(2.152)	(1.114)	(2.568)	(1.993)
Parents can help	0.965	2.619**	-0.558	0.952	1.114	0.960	-3.913**	1.569
	(1.440)	(1.316)	(1.420)	(0.834)	(1.412)	(0.876)	(1.808)	(1.523)
Feel comfortable	4.369*	3.312*	0.883	1.856	1.922	3.904***	-2.195	4.334**
	(2.424)	(1.841)	(1.879)	(1.259)	(1.989)	(1.272)	(1.890)	(2.161)
Facing prejudice	-0.876	1.962	0.438	-0.321	-2.369	1.076	-2.852*	-0.155
	(1.578)	(1.216)	(1.353)	(1.229)	(1.472)	(0.811)	(1.550)	(1.613)
Good income	-1.706	-0.031	-3.303*	0.376	1.203	-0.378	1.444	1.755
	(2.110)	(2.973)	(1.778)	(1.588)	(2.423)	(1.023)	(2.290)	(2.147)
Help others	3.503*	2.054*	0.201	-0.720	-1.361	-1.923**	1.934	-0.438
	(1.889)	(1.118)	(1.418)	(0.917)	(1.481)	(0.977)	(1.476)	(1.275)
Help world	-3.191*	0.212	-0.249	-2.914**	2.228	-0.640	-2.583	-0.803
	(1.842)	(1.312)	(1.740)	(1.145)	(1.723)	(0.859)	(1.782)	(1.685)
Work-life balance	3.596*	2.800	0.512	-0.568	1.830	0.024	2.194	-1.805
	(1.994)	(1.969)	(1.585)	(1.258)	(2.078)	(1.037)	(1.765)	(1.955)
Desirable status	1.870	1.181	0.955	0.307	-0.262	-0.873	0.468	4.524**
	(1.569)	(1.272)	(2.425)	(1.097)	(1.360)	(0.913)	(1.930)	(2.050)
Students	59	67	108	102	76	115	96	87
McFadden R^2	0.344	0.419	0.575	0.390	0.369	0.390	0.679	0.617

Notes: Conditional logit estimates of the choice between the four occupational fields on students' subjective beliefs about each field, estimated separately for each grade level and gender on the subsample of students assigned to the *Private* condition. Beliefs are measured on a 0–1 scale, so a coefficient is the utility weight the respective job attribute receives. The model includes no alternative-specific constants; business, administration and culture is the base alternative. The McFadden R^2 is computed against a model that predicts each field with the cell's own observed field shares. Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

C Questionnaire and Instructions

Student Questionnaire

Section 1 - General Questions on Career Planning

Alright, let's get started!

We're going to ask you a series of questions now. Please answer all questions honestly!

If you're not sure how to answer a question, let us know and we'll come to you as quickly as possible.

Thanks for taking part!

Q1. How much have you thought about what you want to do after Realschule/Mittelschule (secondary school)?

☐ Not at all ☐ Barley ☐ Somewhat ☐ A lot ☐ In great detail

Q2. How sure are you about what you want to do after Realschule/Mittelschule?
Move the slider to the position that best matches your opinion. If the slider is already in the right place, tap it once. You can only continue once you've touched the slider.

Slider: Totally unsure Somewhere in between Totally sure

Q3b. Have you already done an internship?
Please tell us how many you've already done. If you haven't done an internship yet, enter "0".

Dropdown: 0, 1, 2, 3, more than 3

Filter Q3b != 0

For the next question and later questions, we've prepared a table with 4 occupational fields for you. It shows you, for each field, some examples of occupations you can train for in that field.

You'll find this table in your envelope (page 1). Use the table whenever you're unsure about a question involving occupational fields.

Q3c. (Filter Q3b!=0) **In which of the occupational fields have you already done an internship?** You can choose more than one occupational field.

☐ Construction, Production & Transportation
☐ Services, Health & Social Affairs
☐ Buisness, Administration & Culture
☐ Natural Sciences, IT & Technology
☐ Actually, I haven't done an internship yet

Q4d. After 10th grade, there are different things you could do. How interesting is each of the three options to you?
Move each slider to the position that best matches your opinion. If a slider is already in the right place, tap it once. You can only continue once you've touched all the sliders.

- Continue going to school to get your Abitur/diploma (FOS)
- Start an apprenticeship/vocational training program
- Work without doing an apprenticeship

Sliders: Totally uninteresting Somewhere in between Totally interesting

Section 4 - Preferences / Weighting of Career Aspects

Now it's about **what you really want and what's important to you.**

Think about the time after Realschule and the decision about what you want to do after 10th grade. Many things play a role in this decision.

Q9. <u>How important is it to you</u> that...

Move each slider to the position that best matches your opinion. If a slider is already in the right place, tap it once. You can only continue once you've touched all the sliders.

	Importance
... you finish the apprenticeship/Abitur/job?	
... you're good at what you do?	
... you enjoy the tasks?	
... you don't find the work too demanding?	
... you have enough money to live on?	
... your parents are proud of you?	
... your parents are able to help you.	
... you feel comfortable in your school or work environment?	
... you don't have to fight against prejudice (e.g., because of your gender or background)?	
... you earn well in the future?	
... you have a job in the future where you help other people?	
... you have a job in the future where you can make the world a better place?	
... you have a job in the future with a good balance between work and family/friends/leisure time?	
... you have a job in the future that other people think highly of.	

Sliders: Totally uninteresting Somewhere in between Totally interesting

Section 2 - Plans for the Time After Realschule/Mittelschule

[Randomized treatment variation: 33% Control, 34% Parents, 33% Peers [variation via individual startcode in envelope]

[Page 1] Please read the next **5 questions** on the following pages carefully! These are about your plans for the future!

[Page 2] These are important questions! That's why we'll make a **copy** of your answers available for
[Control] you
[Parents] you and your parents
[Peers] you and 2-3 of your classmates.

[Page 3] [Control] **You can look at your answers again at home.**
Your answers will not be shared with anyone except you.
[Parents] **Discuss your answers about your plans for the future with your parents.**
Your answers will not be shared with anyone except your parents.
[Peers] **Discuss your answers about your plans for the future with your classmates.**
Your answers will not be shared with anyone except your classmates.

Q410[control] Q385[parents] Q416[peers]

Please answer the following comprehension question before answering the next 5 questions. *If you're not sure, you can read the information below again.*

With whom will your next 5 answers be shared?

- ☐ Only with you
- ☐ With you and your parents
- ☐ With you and 2-3 of your classmates
- ☐ With you and your teachers

Q418(Filter Q410 != 4) **Q392** (Filter Q385 != 5) **Q400** (Filter Q416 != 6) (*answer must be correct to continue)*

Please read the 6 sentences above again carefully and then answer the question correctly.

With whom will your next 5 answers be shared?

- ☐ Only with you
- ☐ With you and your parents
- ☐ With you and 2-3 of your classmates
- ☐ With you and your teachers

QH4a. What would you most like to do after Realschule/Mittelschule?
I would most like to...

- ☐ … continue going to school to get my Abitur/diploma
- ☐ … start an apprenticeship/ vocational training program
- ☐ ... work without doing an apprenticeship

Q4d_inside. How interesting is each of the three options to you?

- Continue going to school to get your Abitur/diploma (FOS)
- Start an apprenticeship/vocational training program
- Work without doing an apprenticeship

Sliders: Totally uninteresting Somewhere in between Totally interesting

QH5a. (Filter QH4a = "Abi") **Which specialization track do you want to choose after 10th grade?***
Please give 2 specialization tracks. Start with the one you'd most like to do. Tap the arrow to see which tracks are available.

1st choice: _____ 2nd choice: _____
Dropdown: Technology, Business; Social Studies; Agriculture, Bio- and Environmental Technology; Design; Health; International Business; I don't know yet

QH5b. (Filter QH4a = "Apprenticeship") **In which occupation would you most like to do an apprenticeship?**
Please give up to 2 desired occupations. Start with the one you'd most like to do.

Please write your answer to the question here. Do not give any names or contact details (addresses, email, phone numbers).

1st choice: _____ 2nd choice: _____

QH5cd_noidea ☐ I don’t know yet

QH5c. (Filter Q4 = "Work") **In which occupation would you most like to work?**
Please give up to 2 desired occupations. Start with the one you'd most like to do.

Please write your answer to the question here. Do not give any names or contact details (addresses, email, phone numbers).

1st choice: _____ 2nd choice: _____

QH5cd_noidea ☐ I don't know yet

For the next question and later questions, we have prepared a table with 4 occupational fields for you. It shows you, for each field, some examples of occupations you can train for in that field.

You'll find this table in your envelope (page 1). Use the table whenever you're unsure about a question involving occupational fields.

Now imagine you are doing an apprenticeship.
This could be right after 9th/10th grade or at a later point in time.

Q6a. In this case: In which occupational field would you most like to do your apprenticeship? In an occupation in ...

☐ Construction, Production & Transportation
☐ Services, Health & Social Affairs
☐ Buisness, Administration & Culture
☐ Natural Sciences, IT & Technology

Q6b. How interesting are these 4 occupational fields to you?
Move each slider to the position that best matches your opinion. If a slider is already in the right place, tap it once. You can only continue once you've touched all the sliders.

Construction, Production & Transportation
Services, Health & Social Affairs
Business, Administration & Culture
Natural Sciences, IT & Technology

Sliders: Totally uninteresting Somewhere in between Totally interesting

We have a few more questions for you. Please read the questions carefully and answer them as best you can.

From now on, all your answers are confidential again.
Your answers to all the following questions will be shared with no one!

If time_taken > 25 min jump to section 6

Section 3a - Expectations Regarding Different Career Paths (25% of participants *show if belief_randomizer == 3*)

Now it's about how you imagine your options after 9th/10th grade.

Imagine you have completed 9th/10th grade.

Loop over tracks; random order

(loop 2) And now: (loop 3) And one last time:

Now imagine that you

1) continue going to school afterward to get your Abitur/diploma (FOS)
2) start an apprenticeship or vocational training program,
3) work without doing an apprenticeship.

Q7. Do you think that...

Move each slider to the position that best matches your opinion. If a slider is already in the right place, tap it once. You can only continue once you've touched all the sliders.

	Continue going to school to get your Abitur/diploma (FOS)	Start an apprenticeship/vocational training program	Work without doing an apprenticeship
... you 1) finish your Abitur, 2) finish your apprenticeship or vocational training, 3) quit the job again soon?			
... you're good at what you do?			
... you enjoy 1) school, 2) the apprenticeship or vocational training, 3) the job?			
... you find 1) school, 2) the apprenticeship or vocational training, 3) the job too demanding?			
... you have enough money to live on?			
... your parents are proud of you?			
... your parents are able to help you.			
... you feel comfortable 1) in school, 2,3) in the work environment?			
... you have to fight against prejudice (e.g., because of your gender or background)?			
... you earn well in the future?			

... you have a job in the future where you help other people?			
... you have a job in the future where you can make the world a better place?			
... you have a job in the future with a good balance between work and family/friends/leisure time?			
... you have a job in the future that other people think highly of?			

Sliders: Definitely not Maybe Definitely

Section 3b - Expectations Regarding Different Occupational Fields (75% of participants *show if belief_randomizer < 3*)

Now it's about how you imagine the occupational fields.

Use the table on page 1 of your envelope to help you again.

Loop over fields; random order

(loop 2) And now:
(loop 3) And once more:
(loop 4) And one last time:

Imagine you're doing an apprenticeship in the occupational field of:

1) Construction, Production & Transportation
2) Services, Health & Social Affairs
3) Business, Administration & Culture
4) IT, Natural Sciences & Technology

Think of an occupation within that field that suits you best, or the field in general.

Q7. Do you think that...

Move each slider to the position that best matches your opinion. If a slider is already in the right place, tap it once. You can only continue once you've touched all the sliders.

	Construction, Production & Transportation	Services, Health & Social Affairs	Business, Administration & Culture	IT, Natural Sciences & Technology
... you finish the apprenticeship?				
... you're good at what you do?				
... you enjoy the work?				
... you find the work too demanding?				

... you have enough money to live on?				
... your parents are proud of you?				
... your parents are able to help you?				
... you feel comfortable in the work environment?				
... you have to fight against prejudice (e.g., because of your gender or background)?				
... you have a job in the future where you earn well?				
... you have a job in the future where you help other people?				
... you have a job in the future where you can make the world a better place?				
... you have a job in the future with a good balance between work and family/friends/leisure time?				
... you have a job in the future that other people think highly of?				

Sliders: Definitely not Maybe Definitely

And so that we can better understand your answers:

Q7b_1 Which specific occupational field did you think of under Construction, Production & Transportation?

Dropdown: Construction; Surveying; Metalworking; Mechanical Engineering; Production; Manufacturing; Agriculture; Transportation; Logistics; I did not think of a specific occupational field.

Q7b_2 Which specific occupational field did you think of under Services, Health & Social Affairs?

Dropdown: Services; Health; Social Affairs.

Q7b_2 Which specific occupational field did you think of under Business, Administration & Culture?

Dropdown: Business; Administration; Art; Culture; Design; Media; I did not think of a specific occupational field.

Q7b_4 Which specific occupational field did you think of under IT, Natural Sciences & Technology?

Dropdown: Natural Sciences; IT; Computing; Electrical; Technology; I did not think of a specific occupational field.

Section 6 - Personal Background

Please answer a few more questions about yourself.

Q15a. What grade are **you in?**

☐ 6th grade
☐ 7th grade
☐ 8th grade
☐ 9th grade

Q15b. When were you born?

Dropdown:
Month: January, February, March, May, June, July, August, September, October, November, December
Year: 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012

Q16.Are you...

☐ a girl
☐ a boy
☐ Not applicable / I don't want to answer this question.

Q17a. Were you born in Germany?

☐ Yes ☐ No

Q17b. (Filter Q17a = No) **How long have you been living in Germany?**

Dropdown: less than 1 year, 1-3 years, 3-10 years, 10-15 years, more than 15 years

Q18. *(Filter if time_taken <= 25 min)* **What grades did you get in the following subjects on your most recent report card?**
Your most recent report card can also be your mid-year report card.

Grade	1	2	3	4	5	6
Math	☐	☐	☐	☐	☐	☐
German	☐	☐	☐	☐	☐	☐
English	☐	☐	☐	☐	☐	☐

Q19. *(Filter if time_taken <= 25 min)* **What are your favorite subjects?**
Please give up to 2 subjects. Start with the one you like the most.

1st favorite subject: _____ 2nd favorite subject: _____

Dropdown: *subjects list Realschule/Mittelschule, see end of document*

Now it's about your **family and your home.**

You might have more than one home - for example, because your parents live separately. In that case, think of the home where you spend most of your time.

Q20. Who normally lives with you in your home?
You can check as many people as you like.

☐ Biological mother
☐ Adoptive mother
☐ Foster mother
☐ Stepmother or father's partner
☐ Grandmother
☐ Biological father
☐ Adoptive father
☐ Foster father
☐ Stepfather or mother's partner
☐ Grandfather
☐ Siblings
☐ Half-siblings
☐ Stepsiblings
☐ Other relatives
☐ Other people

Q21. What religion do you have at home?
You can check as many religions as you like.

☐ Catholic
☐ Protestant
☐ Orthodox (Russian/Greek/ etc.)
☐ Jewish
☐ Muslim
☐ Hindu
☐ Buddhist
☐ Others
☐ None
☐ Not applicable/ I don't want to answer

Q22a. *(Filter if time_taken <= 25 min)* **How many siblings do you have?**
Dropdown: 0 to 10, more than 10

Q22b. (if Q22a != 0 And *time_taken <= 25 min)* **How many older siblings do you have?**
Dropdown: 0 to value from Q22a

Now we're going to ask a few more questions about your **parents**.

You might not be sure who we mean by "parents." In that case, think of the people who are like a mother/like a father to you - for example, your biological mother or female guardian, or your biological father or male guardian.

Q23a. **Where were your parents born?**

☐ My biological mother and my biological father were born in Germany.
☐ My biological mother was born in Germany, my biological father abroad.
☐ My biological mother was born abroad, my biological father Germany.
☐ My biological mother and my biological father were born abroad.
☐ Not applicable / I don't know.

Q23b. (Filter 23a == 3 or == 4 And *time_taken <= 25 min*) **In which country was your mother born?**

Dropdown: *country list*

Q23d. (Filter 23a ==2 or == 4 And *time_taken <= 25 min*) **In which country was your father born?**

Dropdown: *country list*

Q24a. What degrees/qualifications does your mother have?
Please indicate, for each qualification, whether it applies to your mother.

My mother has...

	Yes	No	I don't know	Not applicable
... a Mittelschule diploma	☐	☐	☐	☐
... a Realschule diploma	☐	☐	☐	☐
... a (vocational) Abitur	☐	☐	☐	☐
... completed an apprenticeship/vocational training	☐	☐	☐	☐
... a college/university degree	☐	☐	☐	☐

Q25a. Does your mother work?

☐ Yes ☐ No ☐ I don't know / Not applicable

Q25b. (Filter Q25a = Yes) **In which occupational field does your mother work?**
You can also select more than one occupational field.

☐ Construction, Production & Transportation
☐ Services, Health & Social Affairs
☐ Buisness, Administration & Culture
☐ Natural Sciences, IT & Technology
☐ None of these / I don't know

Q26a. What degrees/qualifications does your father have?
Please indicate, for each qualification, whether it applies to your father.

My father has...

	Yes	No	I don't know	Not applicable
... a Mittelschule diploma	☐	☐	☐	☐
... a Realschule diploma	☐	☐	☐	☐
... a (vocational) Abitur	☐	☐	☐	☐
... completed an apprenticeship/vocational training	☐	☐	☐	☐
... a college/university degree	☐	☐	☐	☐

Q27a. Does your father work?

☐ Yes ☐ No ☐ I don't know / Not applicable

Q27b. (Filter Q27a = Yes) **In which occupational field does your father work?**
You can also select more than one occupational field.

☐ Construction, Production & Transportation
☐ Services, Health & Social Affairs
☐ Buisness, Administration & Culture
☐ Natural Sciences, IT & Technology
☐ None of these / I don't know

If time_taken <= 25 minutes

Oh, you were fast!
We'd like to ask you just a few final questions.

Section 7 - Perceived Parental Expectations

Now it's about how your **parents or guardians** picture your future.

You might not be sure who we mean by "parents." In that case, think of the people who are like a mother or like a father to you.
For example, your biological mother or female guardian, or your biological father or male guardian.

Q28b. How important is it to your mother what you do after Realschule/Mittelschule?

☐ Unimportant ☐ Rather unimportant ☐ neither/nor ☐ Rather important ☐ Important

☐ Not applicable

Q30b. How important is it to your father what you do after Realschule/Mittelschule?

☐ Unimportant ☐ Rather unimportant ☐ neither/nor ☐ Rather important ☐ Important

☐ Not applicable

Q28a. What does your mother most want you to do after Realschule/Mittelschule?
My mother would most like me to...

☐ … continue going to school to get my Abitur/diploma
☐ … start an apprenticeship/vocational training program
☐ … work without doing an apprenticeship
☐ Not applicable

Q29a. Imagine you do an apprenticeship after Realschule/Mittelschule.
Which occupational field does your mother think is best for you?

☐ Construction, Production & Transportation
☐ Services, Health & Social Affairs
☐ Buisness, Administration & Culture
☐ Natural Sciences, IT & Technology
☐ Not applicable

Q30a. What does your father most want you to do after Realschule/Mittelschule?
My father would most like me to...

☐ … continue going to school to get my Abitur/diploma
☐ … start an apprenticeship/vocational training program
☐ … work without doing an apprenticeship
☐ Not applicable

Q31a. Imagine you do an apprenticeship after Realschule/Mittelschule.
Which occupational field does your father think is best for you?

☐ Construction, Production & Transportation
☐ Services, Health & Social Affairs
☐ Buisness, Administration & Culture
☐ Natural Sciences, IT & Technology
☐ Not applicable

Section 5: External Influences

Q11a. How <u>much</u> do you talk with the following people about your plans for the future?
Please check what applies for each person.

	Not at all	Sometimes	Often	Not applicable
mother	☐	☐	☐	☐
father	☐	☐	☐	☐
Siblings	☐	☐	☐	☐
Other relatives	☐	☐	☐	☐
Friends	☐	☐	☐	☐
Teachers	☐	☐	☐	☐

Q11b. How <u>openly</u> do you talk with these people about your plans for the future?
Please check what applies for each person.

(Filter in answers, Q13a != Not at all Or Not applicable)

	Not very openly	Somewhat openly	Completely openly
mother	☐	☐	☐
father	☐	☐	☐
Siblings	☐	☐	☐
Other relatives	☐	☐	☐
Friends	☐	☐	☐
Teachers	☐	☐	☐

Q12. Both your own wishes and the wishes of your parents/guardians play a role in choosing your plans for the future. In your opinion, how much influence should you and your parents/guardians have on this choice:

Sliders: Only I should make this choice My parents and I should make this choice together, equally Only my parents should make this choice

C.2 Overview table of occupational fields with exemplary occupations

Short label	Occupational field	Examples of occupations in this field
Construction, Production & Transportation	Construction, surveying, metalworking, mechanical engineering, production, manufacturing, agriculture, transportation, or logistics	- Bricklayer - Surveying Technician - Industrial Mechanic - Machine Operator - Farmer - Carpenter - Motorcycle/Bicycle Mechanic
Services, Health & Social Affairs	Services, health, social work, or education	- Hotel Manager - Medical Assistant (including veterinary medicine) - Nurse - Early Childhood Educator - Physical Therapist - Cook - Paramedic/EMT
Business, Administration & Culture	Business, administration, art, culture, design, or media	- Office Administrator - Event Manager - Police Officer - Call Center Agent - Media Designer - Tax Clerk - Fashion Designer
IT, Natural Sciences & Technology	Natural sciences, IT, computing, electronics, or technology	- Lab Technician - IT Specialist - Electronics Technician - Mechatronics Technician - Pharmaceutical-Technical Assistant - Plant or Industrial Mechanic - Technical Draftsperson