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ABSTRACT

Teacher Personality and the Perceived Socioeconomic Gap in Student Outcomes*

We randomly assign student profiles to teachers and elicit teachers' beliefs about the student's likelihood of success in alternative high school tracks. We document a large and statistically significant gradient in teachers' beliefs about students' high school prospects with respect to students' socioeconomic background (SEB), ceteris paribus. We find that this gradient varies with teacher's personality, a hard-to-observe and understudied teacher trait. Specifically, higher levels of teacher's extraversion and openness are associated with a steeper negative SEB gradient in teachers' beliefs about students' success prospects in an academic track. Conversely, more conscientious and agreeable teachers assign to low-SEB students, on average, a higher probability of success in a vocational track. We discuss some policy implications of our findings.

JEL Classification:	I20, I24
Keywords:	teachers' beliefs and personality, choice of high school tracks, Italy

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Introduction

It is well known that students from low socioeconomic backgrounds (SEB) are significantly more likely to attend low educational tracks than their same-ability high-SEB peers, raising concerns for low-SEB students' outcomes and for inequality more generally.[1] The literature has considered multiple explanations for the observed SEB differences in track sorting, including the greater financial, informational, and/or psychological constraints low-SEB students face (e.g. Cameron and Heckman, 2001); SEB differences in preferences (e.g. Giustinelli, 2010), aspirations (e.g. Fruttero, Muller, and Calvo-González, 2024), or beliefs (e.g. Giustinelli and Pavoni, 2017); SEB differences in parental involvement and parenting styles (e.g. Doepke, Sorrenti, and Zilibotti, 2019).

The choice of track is affected also by teachers, via grading (e.g. Burn, Fumagalli, and Rabe, 2024), track recommendations (e.g. Carlana, La Ferrara, and Pinotti, 2022), and less formal actions and interactions with students and families. Teachers' grading and recommendations generally depend on the beliefs and expectations teachers have about their students, which in turn depend on the beliefs about the determinants of students' success in and after school. The latter may include students' tastes, abilities, and effort, as well as other students' characteristics and resources such as their demographics and socioeconomic background.

Notwithstanding their conceptual relevance, teachers' beliefs and expectations have been prominent omitted variables in the empirical economic literature on the SEB gradient in track sorting and other education outcomes, mainly due a lack of interpretable data (see Giustinelli (2023) on high-income contexts and Sabarwal, Abu-Jawdeh, and Kapoor (2021) on low-income contexts).

In this paper, we begin to fill this gap by directly measuring and analyzing teachers' beliefs about the likelihood of students' success in alternative high school tracks. We find that these beliefs incorporate a large and statistically significant SEB gradient. We also find that they vary across teacher characteristics, most notably with (self-

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[1] See Betts (2011) on the ubiquitousness of tracking, its different forms, and their effects on students' outcomes.

assessed) personality. Higher levels of teacher's extraversion and openness are associated with a steeper negative SEB gradient in teachers' beliefs about students' success prospects in an academic track. Conversely, more conscientious and agreeable teachers assign to low-SEB students, on average, a higher probability of success in a vocational track.

I. The Institutional Setup

Upper secondary education in Italy is structured in three main tracks: academic (*licei*, which are organized into separate scientific and humanities-oriented curricula), technical (*istituti tecnici*), and vocational (*istituti professionali / istruzione e formazione professionale*). Vocational education provides ready to use skills associated with production activities. Technical education supplies scientific and technological competencies that are useful in technical professions. Academic education is more general, preparing students for further education rather than for specific jobs, and is perceived as more prestigious and challenging than technical and vocational education. Further details on the system are in the Appendix.

Italian teachers play a direct role in students' transition from junior high school (untracked) to high school (tracked), as they are required by law to provide students and their families with formal — though nonbinding — track recommendations, whose goal is to help students select their best-fitting track. The literature points to a greater influence of teachers' recommendations on low-background students, whose parents are generally less involved or less conscious of the importance of track choice (e.g. Bonizzoni, Cavallo, and Romito, 2014), implying that teachers' recommendation can influence social mobility.

For their recommendations, teachers rely on their beliefs about the students' chances of succeeding in each track (Parente, 2020), while also considering students' and families' preferences. The available empirical evidence shows that teachers' recommendations are correlated with students' academic performance, gender, immigration background, and socioeconomic background (Argentin, Barbieri, and Barone, 2017). However, little is known about the link between teachers' beliefs and

students' characteristics, and about how teachers' characteristics contribute to shape this link.

II. The Data

We collected our data in 2023 via an online survey directed at junior high school teachers working in Veneto, the most populated region of the Italian North-East. Teachers were presented with hypothetical but realistic vignettes portraying an 8th grade student (final year of junior high school) confronting the choice among four high school tracks (academic with a scientific curriculum, academic with a humanities curriculum, technical, and vocational).

Each vignette specified a "student profile," including the student's name (revealing student's gender and immigration background), interests and school performance in the humanities and math (capturing the student's aptitudes and cognitive skills), personality (capturing noncognitive skills), parental occupation (capturing the student's SEB), and choice preference over tracks along those of the student's parents. To induce independence between teachers' and students' characteristics—often correlated in observational data—we randomized the student profiles across survey participants. We then asked teachers to assess the likelihood that a student with a specified profile would successfully and timely graduate from each high school track, what we refer to as teachers' beliefs.

The survey collected also teacher characteristics, including their self-reported personality traits in terms of the so called Big Five: extraversion, conscientiousness, openness, agreeableness, and neuroticism. Using principal component analysis, we extract from these (standardized) traits three personality factors, capturing extraversion and openness (factor 1), conscientiousness and agreeableness (factor 2), and neuroticism (factor 3). Further details on the survey are in the Appendix.

III. The Empirical Analysis

Our empirical analysis focuses on 235 respondents who provided complete information on their personal characteristics (e.g., socio-demographics, work

experience, and self-reported personality) and answered the questions associated with the vignettes illustrating hypothetical student characteristics.

Reported teachers' beliefs vary across the four high school tracks. For simplicity, we group these tracks into two: "high" (academic humanities/scientific) and "low" (vocational/technical). For each of these two tracks z (z=1,2), we regress the belief of teacher i about the likelihood that a student with profile j would successfully and timely graduate from that track on the three teacher personality factors, a dummy for whether the student SEB is low, the interactions between each teacher personality factor and the student SEB, and two vectors of conditioning variables, one including teacher characteristics X and one with vignette student characteristics V. We estimate:

$$Y_{ijz} = \alpha_z + \sum_{n=1}^{3} \gamma_{nz} Factor_{n_i} + \gamma_{4z} Low_{SEB_j} + \sum_{n=1}^{3} \beta_{nz} Factor_{n_i} * Low_{SEB_j} + \gamma_{5z} X_i + \gamma_{6z} V_j + \varepsilon_{ijz} \qquad (1)$$

where X_i includes teacher's gender, years of teaching experience, teaching subject, province and municipality size of the location where the teacher works, high school diploma, recent training on student orientation, whether teachers are currently teaching final year junior high school students, and the hours devoted to orientation activities during the current school year. V_j consists instead of the vignette student characteristics described above. We also include a dummy indicating the curriculum within the grouped track.

The two equations for z=1,2 are estimated jointly, and standard errors are clustered at the teacher level. To guarantee that our working sample mimics the regional population of teachers with respect to gender and province of work, we use entropy balancing and apply the associated weights to our regressions.

IV. Results

Table 1 presents the estimates of equation (1), highlighting the effects of teachers' personality (factors 1 to 3), students' poor parental background (low SEB) and the interactions between the two. Columns (1) and (3) refer to the vocational/technical track, whereas columns (2) and (4) refer to the academic track. We find that teachers' beliefs that students will successfully complete each track are lower for students with

low SEB, especially for the academic track. Expressed as percent of the overall mean, the negative gap is equal to 20.7 percent (-12.17/58.61) for the academic track, and to 6.5 (-3.84/58.61) for the vocational / technical track. As shown in the Appendix, these beliefs are consistent with observed student outcomes, as the probability of completing high school, the probability of completing an academic high school, and the final marks in high school are significantly lower for students with low SEB.

The effect of students' SEB on teachers' beliefs varies by teacher personality. To evaluate this variation, we consider as baseline a hypothetical situation where all three personality factors are in the range [-0.5, 0.5]. We then compute how the marginal effect of low SEB on teachers' beliefs changes when adding a standard deviation to each of the three personality factors.

We find the SEB negative gradient on beliefs is larger among more extraverted and open-to-experience teachers. Adding one standard deviation to factor 1, which loads positively on extraversion and openness, increases the negative gradient from -16.94 (28.9 percent of the overall mean) in the baseline to -27.42 (46.6 percent) in the academic track and from -2.26 (3.8 percent) to -4.76 (8.1 percent) in the other track. The negative gradient is also larger among more neurotic teachers. Conversely, a low SEB increases the beliefs of success in a vocational/technical track if teachers are one standard deviation more conscientious and agreeable, from -2.26 (3.8 percent) in the baseline to 10.09 (17.2 percent).[2]

While the literature has stressed the importance of teacher characteristics such as cognitive skills, gender, and race in shaping students' outcomes (e.g. Dee, 2004), our findings indicate that personality also matters for teachers' belief formation and, through the latter, may affect track recommendations.

Conclusions

The literature shows that teachers' characteristics, such as gender, race, and cognitive skills, affect student outcomes and teacher beliefs about these outcomes. By modifying

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[2] We show in the Appendix that these results hold also when we consider female teachers only and when we do not use the entropy balancing weights.

beliefs, they alter teacher choices and behaviour. In this paper, we have emphasized the role played by teacher personality, a characteristic that has never been investigated, because it is hard to observe both by the econometrician and by others interested in teachers' behaviour and performance, including principals, families, and students.

Using data from an online survey conducted in 2023, we have shown that teachers have lower academic expectations for low-SEB students, compared to medium/high SEB students of equal academic ability, attitudes, personality, gender, and migratory background, and that the effect of students' SEB on teachers' beliefs vary with teacher personality. Teachers with similar observable characteristics who are more extrovert and open to experience are more pessimistic about the chances that low-SEB students can succeed in the academic high school track. On the other hand, teachers who are more conscientious and agreeable have higher beliefs that these students can succeed in the vocational/technical track.

Our data cannot tell whether teachers' expectations are correct predictors of actual SEB gaps or contribute to cause them via a self-fulfilling-expectation mechanism. However, our finding that teachers' expectations depend on teacher personality, holding constant student characteristics, at least indicates that not all teachers are correct in predicting SEB gaps. Indeed, correct predictions should reflect only students' characteristics and attitudes, possibly up to random noise, and should not systematically depend on teacher personality.

An implication of our study is that students with similar characteristics but low parental background who are allocated to teachers with specific personality traits may be induced by these traits to choose different high school tracks, with potential long-term consequences for their future education and labour market career. This problem may be addressed by adopting policies that reduce the influence of teacher personality – for instance by relying on artificial intelligence tools. Alternatively, "objective" factors such as test scores should be given a higher weight in the recommendation process, reducing teachers' discretion (Van Leest et al., 2021). Finally, the assessment of teachers' personality traits could take place prior to beginning a university program

in educational studies or starting a teaching position. Desirable traits could include non-cognitive skills that improve teacher effectiveness (e.g. Thijssen, Rege, and Solheim, 2022).

Table 1: Teacher beliefs about the likelihood of vignette student's successfully and timely completing the vocational/technical and academic tracks.

	Technical / vocational	Academic	Technical / vocational	Academic
	(1)	(2)	(3)	(4)
Low socio-economic background (SEB)	-3.838	-12.17***	-2.786	-16.87***
	(4.260)	(4.550)	(3.925)	(4.143)
Personality Factor 1	1.176	-0.373	2.117	1.536
	(1.737)	(1.483)	(1.972)	(1.500)
Personality Factor 2	-1.430	0.272	-3.619*	0.319
	(1.769)	(1.362)	(1.992)	(1.515)
Personality Factor 3	0.395	0.926	1.239	1.164
	(1.548)	(1.434)	(1.650)	(1.459)
Low SEB * Personality Factor 1			-2.676	-11.23***
			(3.248)	(3.013)
Low SEB * Personality Factor 2			13.83***	-3.107
			(4.273)	(4.212)
Low SEB * Personality Factor 3			-1.533	-5.025
			(3.392)	(3.941)
Weights	yes	yes	yes	yes
Marginal effect of low SEB evaluated at baseline			-2.266	-16.939***
Marginal effect of low SEB evaluated at +1 standard deviation of Factor 1			-4.765	-27.428***
Marginal effect of low SEB evaluated at +1 standard deviation of Factor 2			10.093*	-19.717***
Marginal effect of low SEB evaluated at +1 standard deviation of Factor 3			-3.827	-22.055***
Weighted mean	68.201	49.015	68.201	49.015
Observations	470	470	470	470

Note: Each regression includes teacher and vignette controls and are weighted using entropy balancing weights. The vocational / technical track includes vocational and technical high schools. The academic track includes schools with a humanities and a scientific curriculum. Standard errors clustered by teacher are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

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Appendix.

A. The Institutional setup

Although by the Italian law a student's graduation track bears no restrictions on access to higher education, students attending different high school tracks experience different education and post-education outcomes. The 2023 survey by Alma Diploma on graduate profiles shows that 89.9% of academic high school graduates intend to continue their education, while only 54.2% of technical high school graduates and 42.2% of vocational high school graduates express the same intention (Alma Diploma, 2023).

Enrollment in and graduation from each track varies by SEB. Using data from the 2018 Participation, Labor, Unemployment Survey (PLUS), Figure A1 shows that the proportion of adults aged 19-34 who graduated from an academic (resp. vocational or technical) high-school is significantly lower (resp. higher) among low-SEB students compared to their medium/high-SEB peers.

B. The online survey

The online survey targets junior high school teachers who are teaching or have taught in the past final-grade students. The survey does not provide teachers with monetary or other incentives but was endorsed by the Regional Education Authority of the Veneto Region, located in the North-east of Italy, which provided practical support by contacting eligible respondents via an official email to school principals with the link to our survey. The link was distributed to teachers by principals. During the three-month fielding period arranged with the Regional Education Authority (June-August 2023), 357 teachers (approximately 2.25% of the eligible population) responded fully or partially to our survey.

The respondents who completed the survey are not a representative sample of the Veneto region. Compared to the relevant population, we over-sample females (85.3 percent versus 76.5 percent) and teachers operating in the province of Vicenza (30.6 percent versus 19.6 percent) and under-sample teachers in the provinces of Belluno and Treviso (8,2 percent versus 22.7 percent). We take these differences into account

with entropy balancing (Hainmueller, 2012), using the generated weights to re-balance out sample in all our regressions.

The survey consists of four sections. The first two sections collect information about the respondents' socio-demographics (place of birth, gender, educational qualifications), self-assessed personality (based on statements mapping into the Big Five personality traits, see McCrae and Costa (2008)), and work experience (place of work, years of experience, grades and subjects taught). The third section gathers information about student orientation activities implemented in the respondents' school. The fourth section introduces the vignette and elicits teachers' beliefs about the expected school performance of the student described in the vignette in the event of enrollment in four alternative high school tracks: vocational; technical; academic, humanities curriculum; and academic, scientific curriculum.

Each vignette describes the "profile" of a hypothetical but realistic final-year junior high school student, specifying the student's name (conveying information on the student's gender and immigration background), interests and school performance in the humanities and math (capturing the student's aptitudes and cognitive skills), personality (capturing noncognitive skills), parental occupation (capturing the student's SEB), and choice preference over tracks along those of the student's parents. The student attributes specified in the vignette were randomly assigned to survey participants, thus generating independence between students' and teachers' characteristics.

Following the economic literature on survey expectations (e.g. Manski, 2004; Giustinelli, 2023), we asked teachers to express their beliefs on a 0-100 scale of percent chance. We used clickable sliders to minimize response anchoring. This format has been also found to have desirable properties with respect to the use of "focal" and/or rounded responses (Bruine de Bruin and Carman, 2018). As customary in the survey expectation literature, we did not incentivize accurate reporting in individual questions. Prior research on survey-elicited beliefs and expectations has found no significant effects of providing financial incentives for accurate belief reporting based on scoring rules (Botelho and Pinto, 2004) and has anyway avoided doing so on the

ground that scoring rules tend to induce biased responses when respondents are not risk neutral (Wiswall and Zafar, 2015).

We verify whether random allocation of vignettes to teachers holds in our data by running balancing tests. Table A1 reports the results and shows only a few cases of statistically significant coefficients. We take this into account by always conditioning our estimates on observed teacher characteristics, therefore assuming random allocation conditional on observables.

Tables A2 and A3 show the summary statistics of the observed characteristics of teachers and students for the sample used in the empirical analysis. We define the student's parental background as low if the mother is unemployed, a housewife or sales assistant, and the father is unemployed, a blue-collar employee, or plumber. The probability of having a low parental background in our working sample is 16 percent (see Table A3).

To reduce the dimensionality of the five personality traits, we carried out a principal component analysis on teacher's standardised Big Five personality traits, obtaining three factors with eigenvalues above or close to 1: factor 1, which loads positively on extraversion and openness (correlations equal to 0.765 and 0.797); factor 2, which loads positively with conscientiousness and agreeableness (correlations equal to 0.776 and 0.809); and factor 3, highly correlated with neuroticism (correlation equal to 0.992). These three factors explain 72 percent of the total variance associated with the Big Five personality traits.

C. Are teacher beliefs in line with actual outcomes?

Using data from the 2014 and 2016 waves of PLUS (Participation, Labour and Unemployment Survey), we explore whether teacher beliefs from our online survey are in line with the actual educational outcomes of low SEB students in Italy. We thus consider whether low-SEB individuals completed high school, and, conditional on completion, whether they graduated from an academic high school track and the grade they achieved in the final exam. We estimate the following equation:

$$R_i = \alpha + \beta_1 Grade_i + \beta_2 Low_{SEB_i} + \beta_3 Age_i + \beta_4 Age_i^2 + \beta_5 Gender_i + \beta_6 Wave_{2016} + \varepsilon_i \quad \text{(A1)}$$

where i is for the individual, *grade* is the final junior high school grade, divided into four categories (sufficient=1; good=2; quite good=3; excellent=4), Low_{SEB_i} is a dummy equal to 1 if both parents have less than upper secondary education, gender is a dummy equal to one for female respondents and $Wave_{2016}$ is a dummy equal to one for year 2016.

The estimates reported in Table A4 confirm that low-SEB individuals are less likely to complete high school. Conditional on finishing high school, they are also less likely to complete an academic track, and their graduation grades are lower compared to medium/high SEB individuals.

The mechanism behind the documented (qualitative) correspondence between the belief-based and outcome-based SEB gaps is unclear, leaving open multiple non-mutually exclusive possibilities: (i) teachers' use of students' SEB in forming expectations (predictions) of students' performance in alternative high school tracks may reflect the belief that a greater access to certain resources (e.g., financial, cultural, etc.) generally increases a student's chances of succeeding in an academic track, above and beyond the student's cognitive and noncognitive skills in junior high school; (ii) teachers' expectations may reflect some form of active discrimination toward their students (e.g., Bursztyn & Yang, 2022); (iii) teachers' expectations may reflect the belief that the high school environment (composed of teachers, principals, peers) is discriminatory toward low-SEB students; (iv) teachers may make performative predictions (Rosenthal & Jacobson, 1968; Brophy, 1983; Jussim & Eccles, 1992; Ferguson, 2003; Jussim & Harber, 2005; Glover, Pallais & Pariente, 2017; Papageorge, Gershenson & Kang, 2020; Hill & Jones, 2021), meaning that, by their very beliefs or expectations, they may affect students' outcomes and further contribute to (if (i) or (iii) are true) or generate (if (i) and (ii) are not true) the SEB gap in realizations.

D. Robustness checks

We check whether the results in Table 1 are robust to: a) the exclusion of male teachers, who are a small minority of the population of teachers; b) the exclusion of entropy balancing weights. As shown by Tables A5 and A6, we conclude that our results are robust to these variations.

Table A1. Balancing tests

Teacher characteristics	Student's name	Student's math grade	Student's humanities grade	Student's effort	Student's attitude	Mother's job	Father's job	Student's personality
Female	0.0904	0.0330	-0.214	0.0988	0.207	-0.549	-1.010**	0.681
	(0.223)	(0.165)	(0.159)	(0.162)	(0.232)	(0.460)	(0.449)	(1.445)
Academic high school	0.335	0.167	-0.0869	-0.121	-0.109	0.0225	-0.572	0.605
	(0.218)	(0.161)	(0.155)	(0.158)	(0.226)	(0.449)	(0.438)	(1.410)
STEM degree	0.153	0.0910	-0.0383	-0.101	0.0732	-0.877	-0.846	0.624
	(0.305)	(0.225)	(0.217)	(0.221)	(0.316)	(0.628)	(0.612)	(1.972)
Province	-0.0550	0.0220	0.00415	0.0625**	0.0436	0.0351	-0.0656	-0.186
	(0.0374)	(0.0277)	(0.0267)	(0.0272)	(0.0389)	(0.0772)	(0.0753)	(0.242)
Born in Centre or South	-0.253	0.324*	0.0402	-0.194	-0.128	0.518	0.472	-0.211
	(0.227)	(0.168)	(0.162)	(0.165)	(0.236)	(0.469)	(0.457)	(1.472)
Size of municipality	0.0297	0.0241	-0.0525	-0.00175	0.0204	0.0324	-0.133	0.496
	(0.0602)	(0.0445)	(0.0430)	(0.0437)	(0.0626)	(0.124)	(0.121)	(0.390)
Open	-0.0322	0.0320	-0.0151	0.0515*	0.0183	0.0441	-0.0296	-0.129
	(0.0376)	(0.0278)	(0.0268)	(0.0273)	(0.0390)	(0.0774)	(0.0755)	(0.243)
Agreeable	0.0611	0.00902	-0.0450	0.0105	-0.0123	-0.0752	0.0597	0.858***
	(0.0447)	(0.0330)	(0.0319)	(0.0324)	(0.0464)	(0.0921)	(0.0899)	(0.289)
Conscientious	-0.0493	0.0258	0.0537*	0.0534*	0.0757*	0.0574	-0.0601	-0.225
	(0.0415)	(0.0307)	(0.0296)	(0.0301)	(0.0431)	(0.0856)	(0.0835)	(0.269)
Extraverted	-0.00330	-0.0215	-0.00216	0.0273	-0.00988	0.0137	0.0939*	0.0652
	(0.0260)	(0.0193)	(0.0186)	(0.0189)	(0.0271)	(0.0537)	(0.0524)	(0.169)
Neurotic	0.0151	0.00110	0.0181	0.0136	0.0284	0.0450	-0.0646	0.347*
	(0.0304)	(0.0224)	(0.0217)	(0.0220)	(0.0315)	(0.0626)	(0.0610)	(0.196)
Teaches humanities	-0.0907	-0.0380	0.0570	-0.0736	0.00293	-0.606	0.0501	-0.556
	(0.240)	(0.178)	(0.172)	(0.174)	(0.250)	(0.495)	(0.483)	(1.555)
Teaches foreign languages	0.0536	-0.0425	0.0523	-0.463**	-0.191	-0.457	0.120	2.735
	(0.280)	(0.207)	(0.200)	(0.203)	(0.291)	(0.577)	(0.563)	(1.813)
Teaches math or sciences	-0.465*	0.0961	-0.111	-0.0280	-0.134	0.306	0.800	-1.190
	(0.250)	(0.185)	(0.178)	(0.181)	(0.259)	(0.514)	(0.502)	(1.616)
Experience	-0.00326	-0.00392	-0.00654	-0.00260	0.0124	0.00231	0.0134	0.0380
	(0.00835)	(0.00618)	(0.00596)	(0.00606)	(0.00868)	(0.0172)	(0.0168)	(0.0541)
Number of observations	235	235	235	235	235	235	235	235

Table A2. Summary statistics for teachers

Variable	Mean	Standard deviation
Probability of completing high school regularly	58.61	30.27
Experience	18.11	9.48
Female	0.78	
Extravert (standardized)	0.00	1.00
Conscientious (standardized)	0.00	1.00
Open (standardized)	0.00	1.00
Agreeable (standardized)	0.00	1.00
Neurotic (standardized)	0.00	1.00
Factor 1	0.00	1.00
Factor 2	0.00	1.00
Factor 3	0.00	1.00
Teaches humanities	0.39	
Teaches foreign languages	0.13	
Teaches math or sciences	0.22	
Born in Centre or South Italy	0.09	
Province of school: Padova	0.18	
Province of school: Rovigo	0.05	
Province of school: Treviso	0.23	
Province of school: Venice	0.15	
Province of school: Verona	0.19	
Province of school: Vicenza	0.20	
Municipality: less than 10000 inhabitants	0.32	
Municipality: more than 100000 inhabitants	0.19	
Municipality: 10000-25000 inhabitants	0.31	
Municipality: 25000-50000 inhabitants	0.12	
Municipality: 50000-100000 inhabitants	0.06	
Has been trained for counselling activities	0.54	
More than 10 hours of counselling activities	0.49	
Has a STEM degree	0.35	
Taught 8th graders in the past	0.20	
Observations	940	

Note: there are 235 observations for each of the four tracks.

Table A3. Summary statistics for students

Variable	Mean	Standard deviation
Female	0.50	
Foreigner	0.50	
Low parental background	0.16	
Math grade: discrete	0.28	
Math grade: excellent	0.34	
Math grade: insufficient	0.38	
Humanities grade: discrete	0.31	
Humanities grade: excellent	0.37	
Humanities grade: insufficient	0.31	
High effort	0.34	
Medium effort	0.32	
Limited effort	0.34	
No special attitude	0.26	
Loves math	0.21	
Loves humanities	0.24	
Love both	0.28	
Extravert (standardized)	0.00	1.00
Conscientious (standardized)	0.00	1.00
Open (standardized)	0.00	1.00
Agreeable (standardized)	0.00	1.00
Neurotic (standardized)	0.00	1.00
Observations	940	

Note: there are 235 observations for each of the four tracks.

Table A4: Actual SEB Gaps in schooling outcomes. Survey PLUS 2014 and 2016.

	(1) Completed high school	(2) Completed high school, academic track	(3) Grade in final exam for those completing high school
Grade: good	-0.036***	-0.1355***	-6.003***
	(0.007)	(0.006)	(0.178)
Grade: quite good	-0.178***	-0.247***	-9.057***
	(0.007)	(0.006)	(0.184)
Grade: sufficient	-0.407***	-0.333***	-13.124***
	(0.008)	(0.008)	(0.261)
Low SEB	-0.216***	-0.224***	-0.762***
	(0.006)	(0.004)	(0.149)
Age	-0.012***	-0.016***	-0.371***
	(0.001)	(0.001)	(0.038)
Square age	0.000***	0.000***	0.004***
	(0.000)	(0.000)	(0.000)
Female	0.007	0.182***	1.828***
	(0.005)	(0.004)	(0.144)
Wave$_{2016}$	0.002	-0.000	-0.024
	(0.0053)	(0.004)	(0.140)
Constant			92.090***
			(0.817)
Observations	68,737	53,307	45,542
R-squared			0.1392

Note: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A5: Teacher beliefs on whether the vignette student would succeed in high school, female teachers

|	(1) Vocational /technical	(2) Academic
Low SEB	-5.790	-18.44***
	(4.046)	(4.158)
Low SEB * Factor 1	2.812	-10.27***
	(4.214)	(3.862)
Low SEB * Factor 2	21.82***	0.108
	(4.498)	(5.039)
Low SEB * Factor 3	2.630	-0.553
	(3.971)	(3.653)
Factor 1	1.312	1.721
	(2.156)	(1.608)
Factor 2	-6.338***	-1.160
	(1.961)	(1.874)
Factor 3	-0.239	0.118
	(1.644)	(1.535)
Constant	87.45***	50.27***
	(12.31)	(11.08)
Weights	yes	yes
Observations	402	402

Note: Each regression includes teacher and vignette controls and are weighted using entropy balancing weights. The vocational/technical track includes vocational and technical high schools. The academic track includes schools with humanities or scientific curricula. Standard errors are clustered by teacher in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table A6: Teacher beliefs on whether the vignette student would succeed in high school, without weighting

	(1) Vocational /technical	(2) Academic
Low SEB	-0.00205	-14.14***
	(3.489)	(3.784)
Low SEB * Factor 1	1.808	-10.02***
	(2.750)	(2.725)
Low SEB * Factor 2	7.589**	-5.116
	(3.837)	(4.116)
Low SEB * Factor 3	-1.667	-2.116
	(2.982)	(3.539)
Factor 1	1.069	1.816
	(1.630)	(1.418)
Factor 2	-1.538	0.942
	(1.644)	(1.360)
Factor 3	0.169	0.593
	(1.445)	(1.399)
Constant	86.49***	39.77***
	(10.09)	(10.50)
Weights	no	no
Observations	940	940

Note: Each regression includes teacher and vignette controls and are weighted using entropy balancing weights. The vocational/technical track includes vocational and technical high schools. The academic track includes schools with humanities or scientific curricula. Standard errors are clustered by teacher in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Figure A1: Percentage of Adults Aged 19-34 Who Graduated from an Academic vs Technical/Vocational Track by Socioeconomic Background (Low, Medium, High)
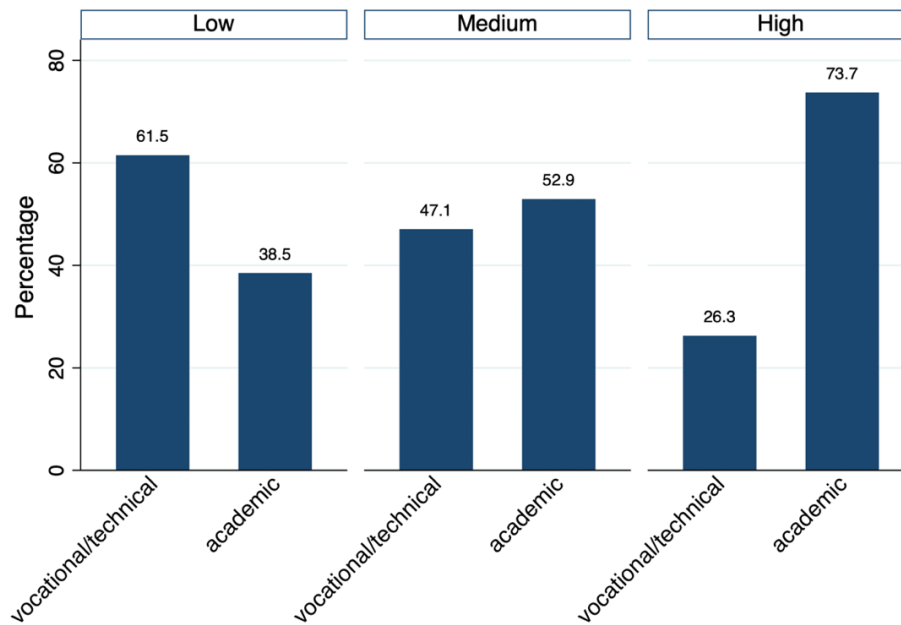
Note: Our elaboration from PLUS data, respondents aged 19-34. Low socioeconomic background: neither parent has a high school diploma or higher degree. Medium socioeconomic background: only one parent has a high school diploma or higher degree. High socioeconomic background: both parents have a high school diploma or higher degree.

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