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The Short- and Long-Run Impact of Comparative Noncognitive Skills

Sofoklis Goulas
Foundry10, Yale University, and IZA@LISER

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Abstract

This study documents a new fact about educational production: Students' relative standing in noncognitive skills has lasting effects on educational trajectories that are distinct from those of absolute skill levels and cognitive achievement. Using administrative data covering the universe of public school students in Greece, I exploit quasi-random classroom assignment to identify the causal impact of comparative noncognitive skills — measured as students' grade 10 classroom rank in grade 9 unexcused absences. A worse ranking in noncognitive skills generates persistent and nonlinear effects on short-run academic performance and longer-run educational trajectories. A worse behavioral rank predicts weaker achievement in Greek Language and Mathematics for both boys and girls in grades 10 and 11. Starting in grade 11, however, responses diverge by gender. A worse ranking in noncognitive skills predicts stronger sorting into vocational schools and less competitive academic tracks for girls, whereas boys sort into more competitive tracks. A worse ranking in noncognitive skills is also associated with greater participation in and higher performance on national examinations for boys only. Boys with a worse ranking in noncognitive skills also apply more frequently to, and are more likely to gain admission to, higher-earning degree programs, while girls' admissions and expected earnings are unaffected. Gender differences in comparative noncognitive skills account for 37 percent of the gender gap in expected post-college salaries. Complementary evidence from a survey experiment shows that comparative behavioral labels systematically shift teachers' expectations and attribution patterns for otherwise identical students. This suggests that relative-standing effects operate through belief-driven institutional responses.

JEL classification

I21, I24, J24, J16

Keywords

noncognitive skills, ordinal rank, peer effects, STEM, gender gap

Corresponding author

Sofoklis Goulas
sofoklis@foundry10.org; sofoklis.goulas@yale.edu

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If men define situations as real, they are real in their consequences.

—W. I. Thomas & D. S. Thomas, The Child in America: Behavior Problems And Programs (1928)

1 Introduction

A growing body of evidence shows that noncognitive skills are strong predictors of educational attainment and labor-market success (Algan et al., 2022; Almlund et al., 2011; Bowles et al., 2001; Deming, 2017; Heckman and Rubinstein, 2001; Heckman et al., 2006; Sorrenti et al., 2025). Yet little is known about *how* these skills translate into educational and economic returns. Skills do not generate value in isolation but through the environments in which they are deployed (Cunha and Heckman, 2007; Rutter, 2006). Because behavioral traits acquire meaning and further influence behavior and access to opportunities within institutional and social settings (Mishler, 1979), their returns are inherently context-dependent. In schools,[1] scarce opportunities are typically allocated through implicit comparisons across students within the same classroom. This raises the question of whether the value of noncognitive skills depends not only on their absolute level but also on their standing relative to others within the same environment.

This study combines quasi-random peer group formation with rich administrative and survey data to examine how comparative noncognitive skills affect short-run academic outcomes and longer-run educational and labor-market trajectories. The data cover the universe of students enrolled in Greek secondary public education and link students' academic records, attendance, and classroom assignments from grades 7 through 12 to their subsequent educational choices, national exam performance, and university admissions. A key advantage of the studied setting is that classroom assignment at the beginning of high school (grade 10) is based on alphabetical order, which generates quasi-random peer groups within schools. This feature creates exogenous variation in comparative skills measures within their school cohort (Jackson, 2012; Kautz and Zanoni, 2024), conditional on the level of skills.

Following Kautz et al. (2014) and Kautz and Zanoni (2024), I proxy noncognitive skills through behavioral disengagement using unexcused absences, which capture suspensions and truancy. Comparative noncognitive skills are then defined as each student's within–grade 10 classroom rank in grade 9 unexcused absences. This approach offers several advantages. First, grade 10 marks entry into high school, a transition that places students in a new institutional environment and reduces the salience of prior reputational labels formed in middle school. Grade 10 (around age 16) is also

[1]Schools are expected to develop noncognitive skills. Bowles et al. (1976) assert that "employer-valued attributes," including perseverance and punctuality, are important products of schooling.

near the center of adolescence (Sawyer et al., 2018), a developmental period in which peer influence is especially strong (Crone and Dahl, 2012). Adolescents become highly sensitive to social evaluation (McCoy et al., 2019; Somerville et al., 2010), and peer presence can amplify risky behavior (Gardner and Steinberg, 2005). In this setting, unexcused absences plausibly capture meaningful differences in behavioral regulation and engagement that are salient within the classroom peer environment. Thus, in this paper, the terms "comparative noncognitive skills" and "comparative disengagement" are used interchangeably.

Measuring noncognitive skills as a relative (within-class) metric is consistent with evidence on rank-order stability in behavioral and personality dimensions over time: Individuals tend to maintain their relative position within a reference group (Roberts and DelVecchio, 2000).This relative framing also aligns with how schools function as institutional environments. The school shapes how behavior is interpreted and responded to by students, teachers, peers, and parents. Through rules, norms, evaluation practices, and social classifications, schools not merely summarize behavior, but cause treatment (Rosenthal and Jacobson, 1968). Thus, what matters is not simply the level of absences, but what that behavior signals relative to other students within a shared classification system. This motivation echoes Mischel's "person–situation debate" (Mischel, 1968), which demonstrates that behavior depends on situational cues and reference points rather than fixed dispositions.[2]

Comparative noncognitive skills may impact educational outcomes through risk-taking behavior. Evidence from neuroscience suggests that peer interactions during adolescence can reshape the brain's dopaminergic system—responsible for reward processing—in ways that heighten the perceived returns to novel experiences and thereby increase risk-taking tendencies (Steinberg, 2017).

This conceptual framework yields several testable implications. First, relative behavioral rank affects outcomes even conditional on absolute behavioral metrics. Second, rank effects are nonlinear and concentrated at the top of the distribution, as extreme relative standing provides a more informative signal of latent behavioral type and therefore triggers stronger belief updating and differential opportunity allocation. Third, improvements in behavior may not fully restore perceived agency due to sticky classification effects that outlast the original signal.

Fourth, if comparative disengagement affects responsiveness to competitive incentives—either because of differential risk-taking propensities across genders or because relative classification generates status threat (Byrnes et al., 1999; Hajovsky et al., 2022; Ridgeway, 2014)—its effects should be strongest along sorting margins. In particular, comparative noncognitive skills should predict track

[2]This does not imply that personality lacks structure: Mischel and Shoda (1995) argue that individuals display consistent patterns of behavioral variability across situations.

selection, national exam participation, and postsecondary specialization, with potentially larger effects for the gender more responsive to competitive incentives. I therefore estimate gender-specific effects on both short- and longer-run educational outcomes and formally test for differences across genders.

This paper delivers four main findings. First, students' comparative noncognitive skills—their relative rank in unexcused absences within the classroom—have persistent and nonlinear effects on academic achievement. Holding constant absolute absence levels, prior performance, and classroom observable and unobservable characteristics, students who rank as more behaviorally disengaged perform worse in Greek Language and Mathematics in grades 10 and 11. These penalties are concentrated in the upper tail of the rank distribution, which indicates that relative behavioral standing matters most among the most disengaged students. Importantly, the effects of comparative noncognitive rank remain statistically and economically meaningful after conditioning on students' comparative cognitive rank. This demonstrates that behavioral rank captures a distinct input of education production.

Second, the effects of comparative noncognitive skills are sharply gendered and emerge most clearly at the point of institutional choice. At the end of grade 10, comparative disengagement predicts stronger sorting into vocational schools for girls. Within the regular academic pathway, boys with higher comparative disengagement sort into more competitive tracks, whereas girls sort into less competitive tracks. By the end of grade 12, comparative disengagement is associated with greater participation in and higher performance on national exams for university admission for boys only. These differences extend to postsecondary choices and expected labor-market outcomes. Comparative behavioral standing strongly predicts sorting into higher-earning degree programs and higher expected salaries for boys but has little effect on girls' expected earnings. This suggests that that relative classroom standing in noncognitive skills contributes meaningfully to gender differences in economic expectations already at college entry. Specifically, comparative disengagement accounts for 37 percent of the gender gap in expected earnings at college entry. These findings show that relative behavioral standing within the classroom may influence educational and economic trajectories along gender-specific paths well before labor-market entry.

Third, survey evidence shows that comparative noncognitive labels operate as powerful institutional signals that reshape both teachers' expectations and their causal interpretations of student outcomes. In a survey-based experiment, 344 teachers evaluate otherwise identical student profiles that differ only in cooperative behavior. Comparative disengagement leads teachers to form systematically more pessimistic beliefs about students' future trajectories. Crucially, these labels do more than affect expectations: They alter how teachers interpret both success and failure. Outcomes for comparatively uncooperative students are less likely to be attributed to student agency and more likely to be explained by classroom conditions, peer dynamics, or broader contextual factors across both behavioral and academic domains. This asymmetric attribution pattern—whereby problems and improvements alike are interpreted as externally driven—suggests a mechanism through which institutional classifications can generate dynamic persistence. By shaping how behavior is perceived, evaluated, and acted on, comparative noncognitive labels may simultaneously influence students' own self-concept and effort choices while also guiding institutional responses and reinforces initial differences over time.

Fourth, using a stylized assignment model in which teachers allocate students to learning opportunities with heterogeneous growth potential based on comparative behavioral signals, I derive a testable prediction: If disengagement operates through belief-driven assignment, its penalty should be largest in environments in which instructional returns are highest. This prediction is borne out most clearly in Greek Language, where disengagement penalties are substantially larger in higher-growth schools, consistent with exclusion from high-return learning opportunities. In Mathematics, by contrast, the largest penalties arise in lower-growth schools, consistent with a more cumulative learning structure in which weaker environments amplify the costs of falling behind.

This paper makes a series of novel contributions. First, it introduces a novel comparative approach to measuring noncognitive skills that emphasizes students' *relative* behavioral standing within the classroom. By exploiting interpersonal differences in noncognitive skills, I show that the behavioral component of human capital is not only individual but also inherently relational and operates through comparison within a salient peer environment. This perspective sheds new light on how comparative noncognitive skills contribute to the emergence of gender inequalities in educational trajectories (Blau and Kahn, 2017).

Second, the paper broadens the set of outcomes used to evaluate noncognitive skills by linking comparative behavioral standing in adolescence to later engagement, track choice, exam performance, postsecondary sorting, and expected labor-market returns. This forward-looking perspective contributes to recent efforts to assess noncognitive skills based on their longer-run predictive power (Duckworth and Yeager, 2015; Kautz and Zanoni, 2024).

Third, the paper contributes to the evidence base regarding when and how noncognitive skills matter during adolescence. Much of the intervention literature emphasizes early childhood or elementary school (Campos et al., 2021; Carneiro et al., 2025a; Sorrenti et al., 2025). In contrast, the findings here show that relative behavioral standing during mid-adolescence has persistent effects on subsequent behavior and educational choices, consistent with the view that noncognitive skills remain malleable—and consequential—well into secondary school.

Fourth, this paper contributes to the growing literature on rank effects in education. A large body of work shows that students' ordinal rank in academic achievement shapes later outcomes, including test scores, educational attainment, field choice, and risky behavior (Delaney and Devereux, 2022; Denning et al., 2023; Elsner and Isphording, 2017; Elsner et al., 2021; Megalokonomou and Zhang, 2024; Murphy and Weinhardt, 2020). More recent studies extend this framework to mental health, internalizing skills, and high-stakes decisions (Brox et al., 2025; Del Bono et al., 2025; Fuchs et al., 2025; Larivière, 2025; Palma, 2025). Across these studies, rank is typically defined based on cognitive achievement or socioeconomic status. In contrast, this paper introduces rank in noncognitive skills as a distinct and previously underexplored dimension to the ranking literature. Rank in noncognitive skills differs from rank in cognitive skills because it operates primarily as a classificatory rather than informational signal. Cognitive rank may update beliefs about students' academic productivity. Rank in noncognitive skills, by contrast, may update beliefs about students' reliability, compliance, and responsiveness to instruction, and thus shapes whether teachers are willing to invest attention or grant access to high-return learning opportunities at all.

Finally, the paper provides new evidence on the sociogenic component of noncognitive skills. Drawing on insights from psychology and sociology (Bronfenbrenner, 1979; Mischel, 1968; Mischel and Shoda, 1995), the analysis shows that the meaning and impact of a given behavioral signal depend on the surrounding peer context. The same level of disengagement can carry different implications depending on how it ranks within the classroom distribution, which demonstrates that noncognitive skills are expressed and rewarded relationally rather than absolutely (Jackson, 2012; Shanahan and Nieswandt, 2011). A key policy implication is that interventions that alter social environments—such as peer composition or classroom context—can generate durable effects even without directly changing underlying traits. This mechanism echoes the dynamic feedback model of Dickens and Flynn (2001), in which social environments and individual skills reinforce one another over time.

The paper develops a theoretical framework in which teacher effectiveness operates through belief-driven allocation of learning opportunities rather than as a uniform instructional input. In standard production-function models, teachers generate homogeneous value added across students conditional on observables. Here, the evidence instead supports a mechanism whereby teachers use comparative behavioral signals to classify students and allocate attention, challenge, and growth opportunities accordingly. Teacher effectiveness is therefore partly endogenous to student classification: The same teacher can produce different learning returns across students because expectations shape investment decisions. This formulation connects the education production function to assignment models with imperfect information, in which perceived productivity determines access to higher-return learning environments. This implies that achievement gaps may arise not only from differences in skills but also from belief-mediated differences in opportunity.

2 Data and Institutional Framework

This section describes the data sources and the institutional context of school and classroom assignment, as well as the Greek college application and admissions process.

2.1 Data

Our analysis combines information from three datasets. The first is the *myschool* administrative database obtained from the Ministry of Education, which covers the universe of middle and high school students in Greece from 2018 to 2025. This longitudinal dataset includes more than 340,000 students enrolled in 1,137 public high schools. Each student record includes an individual identifier, school and classroom identifiers, gender, a complete history of class and track enrollment, high school graduation status and year, and test scores in every subject and grade. The data cover all middle and high school grades (7 through 12), and the high school panel spans the years 2018 to 2025.

Second, I obtained administrative data from the National Exam Bureau of the Ministry of Education, which can be longitudinally linked to the *myschool* dataset. For each student who participated in the national university entrance exams, these data include performance in each subject, all submitted college applications, admission outcomes, and the degree program of admission. Third, to approximate expected labor-market returns, I use data from the 2022–2024 Labor Force Survey to link each university department to the corresponding occupational categories and their associated salaries. Specifically, I map each field of study to the most closely related occupation and assign to it the average annual earnings observed in the survey (in euros). These salary figures serve as proxies for students' expected post-graduation earnings from each academic program.

The analysis considers a rich set of outcomes. Academic achievement outcomes include standardized test scores from school exams in Greek Language and Mathematics at the end of grades 10 and 11, as well as performance on the national university entrance examinations in grade 12. End-of-year school exams are internally proctored and marked; exam questions are selected collectively by the school faculty, and final scores are reviewed by the principal. National university entrance examinations are externally proctored and centrally graded. Questions are set by a national committee, and each exam paper is independently graded by at least two evaluators.

Behavioral outcomes measure subsequent engagement through both unexcused and total absences in grades 10–12. Educational choice outcomes capture sorting across pathways, including enrollment in competitive and noncompetitive STEM tracks, non-STEM tracks, transfers to vocational schools, and public school dropout by grade 11. Additional extensive-margin outcomes include participation in the national examinations. Postsecondary orientation is measured through the number of applications to high-earning university programs, admission to such programs, overall university admissions, and the expected log salary associated with the degree program to which a student is admitted.

Table 1 reports summary statistics on absences, academic performance, track choice, national exam outcomes, and expected salaries for the full sample and separately for boys and girls. Across grades, boys and girls exhibit significant differences in unexcused absences, performance in both STEM and non-STEM subjects, study choices, and longer-term outcomes such as college applications, admissions and expected earnings.

2.2 Quasi-random Classroom Assignment

The Greek educational system is highly centralized (OECD, 2018). Students are assigned to public schools through a zoning process based on their residential address. Upon enrollment in a high school (grade 10), each student is placed in a classroom in which all subjects are taught. The assignment of students and teachers to classrooms within each school is effectively random (Lavy and Megalokonomou, 2024). Specifically, in accordance with a strictly enforced law, students are allocated to classrooms in alphabetical order based on their last name (Goulas, Griselda, and Megalokonomou, 2022; Goulas, Gunawardena, Megalokonomou, and Zenou, 2024; Goulas and Megalokonomou, 2020).[3] Students are not permitted to switch classrooms. This alphabetical assignment rule generates quasi-random variation in classroom peer composition, as I demonstrate in Section 3.4.

2.3 College Application and Admission

Tertiary education in Greece is tuition-free. At the end of grade 12, students take standardized national exams that are externally proctored and graded. During the years covered by our study,

[3]See Government Gazette of the Hellenic Republic 167 A/1566/1985. See also Ministry of Education Bulletin 100749/Γ2/17-09-07.

these exams served as the sole criterion for college admission. After completing the exams, students submit to the Ministry of Education a ranked list of preferred degree programs. There is no restriction on the number of programs a student may list, but each student ultimately receives a single admission offer.

3 Effect of Comparative Noncognitive Student Skills

3.1 Defining Comparative Noncognitive Skills

I use the term "noncognitive skills" to refer to personal attributes not fully reflected in achievement tests. Kautz et al. (2014) highlight the malleability of these attributes and prefer the term "skills," since they can be shaped or learned. These skills represent productive inputs into learning that complement cognitive ability and reflect students' capacity to engage with academic tasks and classroom norms. Although the construct of executive function demonstrates the inadequacy of terms such as "cognitive" and "noncognitive," many personality skills nevertheless are conceptually and empirically easily distinguished from general cognitive ability. Consistent with this distinction, most personality skills are very weakly correlated with intelligence tests (Ackerman and Heggestad, 1997; McCrae and Costa, 1994; Stankov, 2005; Webb, 1915).

Personality psychology commonly organizes individual differences in noncognitive skills into the Big Five taxonomy, which distinguishes between *openness to experience*, *conscientiousness*, *extraversion*, *agreeableness*, and *neuroticism* (John and Srivastava, 1999). I proxy a student's noncognitive skills using grade 9 unexcused absences, which capture suspensions and truancy.[4] The idea is that unexcused absences reflect dimensions of behavioral capital such as self-discipline. Unexcused absences is a behavioral indicator that closely aligns with specific dimensions of this taxonomy. Among

[4]Survey evidence from 700 high school students show that unexcused absences include suspensions for disciplinary infractions. The survey was administered to students in 31 classrooms across grades 10, 11, and 12 in five public schools in September 2022. The survey collected information on students' perceptions regarding whether they had observed disruptive peers receiving absences as a penalty for their behavior and the types of behavior that led to unexcused absences. Figure S5 is based on a questionnaire item that asked students "Have you witnessed the use of hourly unexcused absences as a penalty for disruptive students?" Students could respond with "Yes" or "No." The preponderance (89.37%) of students reported having seen disruptive students receive absences as a penalty. Figure S5b reports survey responses by students to the following questionnaire item: "In what way can a student in your classroom behave to receive unexcused absences as a penalty?" Students could select multiple options, including "Disrupting Others' Attention," "Making Noise," and "Being Disengaged." The results show that 92.14% of students reported that "Making Noise" was a common reason for unexcused absences; 62.68% cited "Disrupting Others' Attention"; and 11.48% chose "Disengagement."

these, *conscientiousness* and *agreeableness* are most strongly associated with school discipline and attendance outcomes. Conscientiousness captures self-control, reliability, and rule-following behavior; students who score lower on this dimension are more likely to exhibit impulsivity, poor time management, and disregard for school norms, which leads to higher rates of unexcused absences and suspensions (Almlund et al., 2011; Heckman and Kautz, 2012; Poropat, 2009). Agreeableness, which reflects cooperativeness and respect for authority, also predicts lower incidence of disciplinary actions, because less agreeable students tend to engage in conflict or become defiant (John and Srivastava, 1999; MacCann et al., 2020). In contrast, *extraversion* and *neuroticism* show weaker or inconsistent associations with such outcomes, while *openness to experience* is largely orthogonal (DeYoung, 2010; Duckworth and Yeager, 2015). Thus, variation in students' unexcused absences can be interpreted primarily as reflecting differences in conscientiousness, and agreeableness to a certain extent.

If unexcused absences reflect skills–specifically, noncognitive skills–one would expect them to exhibit substantial serial correlation over time much like test scores, which reflect cognitive skills and display considerable persistence. The idea is that noncognitive skills, malleable as they may be, should nonetheless demonstrate some degree of stability over time (Almlund et al., 2011; Mischel et al., 2011). By contrast, if unexcused absences primarily reflect transient student circumstances rather than structural traits, their serial correlation should be low. Figure S6 uses longitudinal data from grades 7–12 to show that unexcused absences exhibit strong within-student persistence, with semester-to-semester correlations exceeding 0.75 and remaining above 0.55 even six semesters apart, while excused absences display near-zero persistence. These patterns indicate that unexcused absences capture stable behavioral tendencies rather than transitory shocks or administrative noise, consistent with evidence that noncognitive traits evolve slowly during adolescence.

Each student's measure of comparative noncognitive skills or comparative disengagement is defined as her within-grade 10 classroom percentile rank of grade 9 unexcused absences as follows:

$$\text{Comparative Noncognitive Skills} = \frac{\text{Ordinal Rank of Grade 9 Unexcused Absences} - 1}{\text{Size of Grade 10 Classroom} - 1} \tag{1}$$

I first compute the ordinal rank of grade 9 unexcused absences for each student, which ranges from 1 to N, where N is classroom size. I focus on the classroom level, because students interact more intensively with classroom peers and are therefore more likely to observe and respond to their relative standing within this group. The student with the most grade 9 unexcused absences in the grade 10 classroom is given an ordinal rank value equal to N. The student with the least unexcused absences in the classroom is assigned a value of 1. To obtain a comparable measure of rank across classrooms, I transform each student's ordinal rank to a percentile rank, as in equation (1). I use this percentile rank as a measure of comparative noncognitive skills or comparative disengagement, and thus it is bounded between 0 and 1. The student with the most unexcused absences within her classroom has a comparative disengagement of 1, while the student with the least unexcused absences has a comparative disengagement of 0.[5]

Studying comparative noncognitive skills measured in grade 9 is advantageous, because grade 10 coincides with entry into high school—a transition that places students in a new institutional environment. This shift provides a "reset," which reduces the salience of prior reputational labels formed in middle school. Crucially, high schools do not observe students' prior unexcused-absence histories, which breaks the direct informational channel through which earlier behavioral classifications could otherwise persist. Using administrative enrollment records, I compute the number of feeder middle schools and prior classrooms represented in each incoming high school cohort and classroom. Cohorts draw students from 5.34 middle schools on average, and the typical grade 10 classroom includes students from 2.68 middle schools and 4.56 grade 9 classrooms. This indicates substantial reshuffling of prior peer groups, which limits the persistence of middle school reputational information.

3.2 Identifying Variation

The identification strategy relies on quasi-randomly formed peer groups (that is, classrooms) within the same school cohort, similar to Goulas et al. (2022); Denning et al. (2023); and Megalokonomou and Zhang (2024). This strategy is similar to that of Elsner and Isphording (2017) and Murphy and Weinhardt (2020), who exploit variation in student prior performance across different school cohorts. This study exploits quasi-random variation in classroom composition within school cohorts that arises from the alphabetical assignment of students to classrooms. This quasi-random peer group formation within school cohorts produces exogenous variation in each student's grade 10 classroom rank, which is based on their grade 9 unexcused absences rank—the measure of comparative noncognitive skills—for a given level of unexcused absences. In other words, the identification strategy compares students with the same unexcused absences (and performance and peer characteristics). These students may have different rankings in grade 9 unexcused absences because they are assigned to classrooms in grade 10 with quasi-random variation in peers' grade 9 unexcused absences. This identification approach also accounts for average classroom characteristics that could

[5] For example, the student with the most unexcused absences in a classroom of 20 students would have an ordinal rank of unexcused absences equal to 20 and a comparative disengagement equal to 1 ($\frac{20-1}{20-1}$). Conversely, the student with the least unexcused absences in a classroom of 20 students would have an ordinal rank of unexcused absences equal to 1 and a comparative disengagement of 0 ($\frac{1-1}{20-1}$).

confound our estimates of interest. Variation in comparative STEM advantage arises from differences in the dispersion of absolute STEM advantage among random peers in classrooms with the same average characteristics. Classrooms may have different dispersions of prior-year unexcused absences because of their small size.[6] The schematic in Figure 1 provides intuition about the source of the identifying variation in comparative noncognitive skills. It considers two students with the same grade 9 unexcused absences X. The students are randomly assigned to different grade 10 classrooms in School A. Classrooms 1 and 2 are identical except for the dispersion of grade 9 unexcused absences among students. Therefore, the two students have different values of unexcused absences rank (i.e., comparative noncognitive skills or comparative disengagement).

Figure 2 shows that there are substantial differences in the gender ratios of students scoring in the higher percentiles of STEM and non-STEM subjects. In particular, the ratio of boys to girls is relatively stable as I move from lower to higher score percentiles in Mathematics. At the same time, the ratio of boys to girls decreases as I move from lower to higher score percentiles in Greek Language.

Figure 3 shows sizeable variation in unexcused absences rank (i.e., comparative noncognitive student skills) with respect to different levels of unexcused absences. The relationship between unexcused absences and unexcused absences rank is increasing, but it exhibits large variation. A student with an unexcused absences value around 8 is likely to have one of the lowest unexcused absences rank values in her classroom. A student with an unexcused absences value around 103 is likely to have one of the highest unexcused absences rank values in her classroom. A student with an unexcused absences value around 43 could have almost any unexcused absences rank, depending on which classroom she is assigned to. Figure 4 shows the distribution of unexcused absences rank values for boys and girls. Boys are more likely than girls to have a higher unexcused absences rank.

Peers may influence educational outcomes through multiple channels, and our empirical investigation does not capture all forms of peer effects. Instead, I focus on one dimension—comparative noncognitive skills—while controlling for two common confounders: (i) the direct effects of own and peers' prior-year absences (unexcused and total) and (ii) the direct effects of own and peers' prior-year academic performance. These controls are important, because ordinal rank measures and peer competition are closely linked (Bertoni and Nisticò, 2023). For example, having peers with more grade 9 unexcused absences can mechanically reduce one's rank in unexcused absences. Thus, focusing only on peers' absences or only on one's rank position would overlook other key peer

[6]Because of the central limit theorem, larger classrooms tend to reflect the population distribution of student ability more precisely, so dispersion should differ less across classrooms. Figure S3 shows substantial variation in the standard deviation of grade 9 unexcused absences within each grade 10 classroom.

influences. I therefore assume that other peer channels are not correlated with students' ordinal rank in grade 9 unexcused absences.

3.3 Empirical Strategy

I estimate the effect of students' comparative noncognitive skills or comparative disengagement, measured by their percentile rank in unexcused absences within the classroom, on short- and longer-term outcomes using the following specification:

$$Y_{icst} = \alpha + \beta\, Unexcused\ Absences\ Rank_{icst} + f(Unexcused\ Absences_{icst}) + X'_{icst}\gamma + \mu_{cst} + \varepsilon_{icst} \tag{2}$$

where Y_{icst} denotes the outcome of student i in classroom c, school s, and cohort t. The main regressor of interest, $Unexcused\ Absences\ Rank_{icst}$, captures the student's relative standing in unexcused absences from grade 9 among classmates of the same grade 10 cohort and school. Because unexcused absences proxy for behavioral and self-disciplinary skills, this variable provides a comparative measure of noncognitive skills within the local peer environment.

The specification controls flexibly for absolute levels of noncognitive skills, which I model in several ways—from linear and polynomial (quadratic through quintic) to fully nonparametric (decile-based) forms. Vector X_{ijst} includes individual characteristics such as gender, prior academic performance in STEM and non-STEM subjects in grade 9, total grade-9 absences (measured in deciles), and interactions of these variables with student gender.[7] I also include classroom fixed effects, μ_{jst}, to absorb unobserved classroom-specific factors such as teacher quality, classroom management style, and peer composition. For outcomes after track specialization, I also account for chosen track indicators in X_{ijst}. Standard errors are clustered at school-cohort level, following Abadie et al. (2023), who recommend clustering at a higher level of aggregation than the randomization unit. I estimate equation (2) using ordinary least squares. Each column in Table 3 corresponds to a different functional form of $f(Unexcused\ Absences_{icst})$: linear, quadratic, cubic, quartic, quintic, and a decile-based specification. To capture potential gender differences in how noncognitive skills translate into academic outcomes, I estimate gender-specific coefficients by interacting the unexcused-absence rank with gender dummies and report the corresponding equality test $H_0 : \beta_{\text{boy}} = \beta_{\text{girl}}$.

Interpreting the coefficient $\hat{\beta}$ as the causal effect of comparative noncognitive skills on student

[7] Interacting prior performance and absence measures with gender allows for heterogeneous effects by gender; for example, girls may be more sensitive to test scores than boys (Owen, 2010). In a robustness exercise, the specification is further augmented with leave-one-out measures of peer characteristics.

performance relies on two key assumptions. The first assumption requires that, conditional on individual performance, absolute absence levels, and classroom fixed effects, unexcused absences rank be uncorrelated with unobserved determinants of achievement or behavior. This assumption is plausible, given that students are quasi-randomly assigned to classrooms within schools based on alphabetical order, which limits systematic sorting. I verify the validity of this assumption by showing that observable characteristics are orthogonal to unexcused absences rank, the variable of interest.

Second, any specification error in the functional form $f(Unexcused\ Absences_{ijst})$ must be orthogonal to the rank measure. Because unexcused absences rank is constructed within the same classroom and conditional on absolute absences, it is unlikely to capture omitted variation in absolute behavior rather than true relative standing. I estimate alternative nonlinear specifications that allow for different functional forms of $f(Unexcused\ Absences_{ijst})$. Allowing for nonlinearities captures effects that may be concentrated in higher portions of the unexcused absences rank distribution and thus attenuated under a linear approximation. For comparison, I also report estimates from a linear specification as a benchmark.

3.4 Validity of the Identification Strategy

This section examines whether students' ordinal within-classroom rank in unexcused absences is balanced with respect to observable classroom and teacher characteristics, which would support a causal interpretation of the effects of comparative noncognitive skills. To assess whether students' within-classroom rank in unexcused absences is correlated with observable classroom characteristics, baseline variables are regressed on unexcused absences rank, following Elsner and Isphording (2017); Elsner and Isphording (2018); Elsner et al. (2021); Denning et al. (2023); and Carneiro et al. (2025b). Table 2 presents the results.

Each row in Table 2 corresponds to a separate regression in which the listed classroom-level characteristic is the dependent variable and the student's ordinal classroom rank in Grade 9 unexcused absences is the independent variable. The set of outcomes includes measures of prior academic performance (mean GPA and subject-specific performance in Mathematics and Greek Language), prior attendance (total and unexcused absences), and classroom gender composition. All regressions include school and year fixed effects. The estimated coefficients are small in magnitude and statistically not significant, which indicates that unexcused absences rank is balanced with respect to observable classroom characteristics.

Table S1 next reports balance tests that examine whether unexcused absences rank is systematically related to observable teacher characteristics. Each row corresponds to a separate regression in which the dependent variable is a binary indicator for teacher gender (female) or teacher seniority,[8] estimated separately for Mathematics and Greek Language teachers. All estimated coefficients are small in magnitude and statistically insignificant, which indicates no systematic relationship between students' relative position in the unexcused absences distribution and the gender or seniority of their teachers. These results confirm that excused absences rank is balanced with respect to teacher characteristics.

To further assess whether classroom composition reflects systematic sorting rather than random assignment, I implement an additional nonparametric diagnostic of classroom sorting as follows. Within each school-by-cohort cell, students are randomly permuted and reassigned to grade 10 classrooms while preserving the observed number of classrooms and their size distribution. This randomization-inference procedure is repeated 500 times. For each simulated classroom assignment, I compute classroom-level means and standard deviations of predetermined grade 9 characteristics, including GPA, subject scores, and absences measures. Table S2 compares the actual cohort-level characteristics with the distribution generated under random assignment. This test evaluates whether pre-treatment characteristics cluster across classrooms more than would be expected by chance. If classroom allocation were effectively random, the observed statistics should lie within the simulated distribution. Deviations from this benchmark would indicate systematic sorting of students across classrooms. Table S2 shows that the observed classroom composition across cohorts closely matches the distribution generated under random assignment. This suggests limited systematic sorting across classrooms of observable academic and attendance characteristics.[9]

4 Results

4.1 Attendance

Table S4 examines how students' comparative noncognitive skills affect subsequent unexcused absences in grades 10 through 12. In the most flexible specification, an increase in unexcused absences rank is associated with strongly statistically significant increases in unexcused absences for both boys and girls in all three grades. Specifically, in grade 10, the estimated effects are 14.41 unexcused absences for boys and 10.97 for girls; in grade 11, 18.63 for boys and 14.66 for girls; and in grade

[8] Teacher seniority is inferred using information on teaching load. Teachers with fewer than 5 years of in-service experience are assigned a teaching load of 21 hours per week, which decreases gradually with additional experience. Teachers with weekly teaching loads below 21 hours are classified as senior.

[9] The results are similar when the same tests are performed at classroom rather than cohort level.

12, 16.87 for boys and 10.08 for girls. The effects are consistently larger for boys than for girls, and the gender differences are statistically significant across grades. This indicates that comparative noncognitive standing is a stronger driver of subsequent disengagement among boys.

Table S5 examines how students' comparative noncognitive skills affect subsequent total absences in grades 10 through 12. An increase in unexcused absences rank is associated with a strongly statistically significant increase in total absences for both boys and girls in all three grades, with consistently larger effects for boys than for girls. The estimated effects on total absences are close to those for unexcused absences, which points to a relatively small effect on excused absences.

4.2 Performance in School Exams

Table 3 reports the estimated effects of comparative noncognitive skills on student performance in grade 10 Greek Language and Mathematics. Each panel reports six specifications that vary only in the functional form of the noncognitive skills; all other variables and controls remain constant. Columns (1)–(5) sequentially incorporate polynomial transformations of unexcused absences (from linear to quintic). Column (6) introduces a flexible nonlinear specification using decile indicators, which is the preferred specification. All regressions control for prior academic performance, subject-specific ability, classroom and cohort fixed effects,[10] and gender interactions. Across specifications, the estimated effect is consistently negative and becomes stronger when allowing for nonlinearities. This pattern suggests that the penalty associated with a higher (worse) rank in unexcused absences is concentrated among the most disengaged students. Students with higher comparative absences rank perform systematically worse. In both Greek Language and Mathematics, a one-decile (0.10) increase in unexcused absences rank is associated with performance declines at the end of grade 10 of approximately 0.006 standard deviations in the most flexible specification for both boys and girls ($p < 0.01$).

Table 4 reports the estimated effects of comparative noncognitive skills on student performance in grade 11. In Greek Language, a one-decile increase in unexcused absences rank is associated with significantly decreased performance at the end of grade 11 by approximately 0.008 standard deviations for both boys and girls. In Mathematics, a one-decile increase in unexcused absences rank decreases student performance in grade 11 by roughly 0.012 standard deviations.

One might worry that the negative association between comparative disengagement and performance in end-of-year school exams reflects differential grading standards rather than true perfor-

[10] An alternative approach would be to additionally control for peer characteristics (leave-one-out classroom averages of STEM and non-STEM performance and of total and unexcused absences). This approach is presented in Table S3 and the results are robust to this augmented specification.

mance differences. This explanation is unlikely in the present setting. End-of-year exam questions in school exams are selected collectively by the school faculty, and final scores are reviewed by principals, limiting the scope for idiosyncratic teacher grading discretion.

4.3 Track Choice

Table 5 examines how comparative noncognitive skills affect track choice in grade 12, the year in which students take the national exams. The analysis distinguishes among competitive STEM, noncompetitive STEM, and non-STEM pathways. In the most flexible specification, unexcused absences rank is not statistically associated with competitive STEM entry for boys ($\hat{\beta} = 0.021$, $p > 0.10$), but significantly reduces participation among girls ($\hat{\beta} = -0.047$, $p < 0.01$). In contrast, higher unexcused absences rank increases entry into noncompetitive STEM tracks for both genders (boys: $\hat{\beta} = 0.247$; girls: $\hat{\beta} = 0.114$; both $p < 0.01$), with the effect significantly larger for boys. Table S6 shows that higher unexcused absences rank is associated with reduced enrollment in non-STEM tracks for both boys ($\hat{\beta} = -0.049$, $p < 0.05$) and girls ($\hat{\beta} = -0.025$, $p < 0.05$). The decline is larger for boys, and the gender difference is marginally statistically significant ($p = 0.052$).

These results indicate that comparative disengagement is associated with sorting away from competitive STEM tracks primarily among girls, while among boys it is more strongly associated with sorting away from non-STEM pathways. Comparative noncognitive skills thus emerge as a novel channel that affects gender-differentiated academic self-selection into competitive fields.

4.4 School Dropout

The data allow tracking of all student transfers within the public school system. This section examines students who exit regular public schools at the end of any grade and traces their subsequent enrollment in vocational or evening schools. On average, 9.5 percent of students leave regular public high schools between grades 10 and 11.[11] Of these 9.5 percentage points, 7.9 correspond to transfers to vocational schools, while fewer than 0.25 correspond to transfers to evening schools. The remaining 1.5 percent exit the public school system entirely. By linking student records to grade 12 national examination data, I can also determine whether students transition to private schools by the time they sit for the exams. Such transitions are negligible among students who are initially enrolled in regular public schools in grade 10. Therefore, observed exits from the public system primarily reflect dropouts rather than transfers to private schools.

Table 6 examines how students' comparative noncognitive skills affect the likelihood of trans-

[11] Table S9 shows no differential overall attrition by gender.

ferring to vocational school by grade 11. In the most flexible specification, unexcused absences rank is associated with a higher probability of vocational school transfer for both boys and girls (boys: $\hat{\beta} = 0.022$, girls: $\hat{\beta} = 0.027$; both $p < 0.01$). The estimated difference between genders is not statistically significant.

Table S10 examines how students' comparative noncognitive skills affect the probability of public school dropout by grade 11. In the most flexible specification, unexcused absences rank is associated with a statistically significant increase in dropout for boys ($\hat{\beta} = 0.011$, $p < 0.01$), while the corresponding estimate for girls is smaller and not statistically significant ($\hat{\beta} = 0.004$, $p > 0.10$). Unexcused absences rank (i.e., comparative disengagement) is significantly more predictive of dropout among boys than among girls.

4.5 Participation and Performance in National Exams for University Admission

Table S7 examines how students' comparative noncognitive skills affect their likelihood of participating in the national exams for university admission. The national examinations are high-stakes, competitive, externally standardized tests administered once annually under uniform nationwide grading procedures, with performance determining access to university programs. In the most flexible specification, an increase in unexcused absences rank is associated with a statistically significant increase in exam participation for boys ($\hat{\beta} = 0.044$, $p < 0.01$), while the corresponding estimate for girls is smaller and not statistically significant ($\hat{\beta} = 0.006$, $p > 0.10$).

Table S8 presents the estimated effects of comparative noncognitive skills on national exam performance at the end of grade 12. In the most flexible specification, a one-decile increase in unexcused absences rank is associated with an increase in performance of approximately 0.026 standard deviations for boys ($\hat{\beta} = 0.258$, $p < 0.01$). The corresponding estimate for girls is close to zero and not statistically distinguishable from zero ($\hat{\beta} = 0.004$). The gender difference is statistically significant.

The positive effects on national exam participation and performance indicate that comparative noncognitive skills may interact with institutional incentive structures. While comparatively disengaged students may underperform in sustained, teacher-mediated settings as shown in Section 4.2, they are more likely to enter—and perform well in—externally standardized, high-stakes competitions. This pattern is consistent with a model in which comparative noncognitive standing shapes responsiveness to incentive salience: routine classroom production penalizes disengagement, whereas tournament-style environments may reward competitive activation.

4.6 Application and Admission to High-earning Programs

Table 7 reports the estimated effect of students' comparative noncognitive skills on the number of applications to high-earning programs (i.e., degree programs with expected earnings in the top quartile). Comparative noncognitive skills are a stronger predictor of applications to high-earning programs among boys than among girls. In the most flexible specification, an increase in unexcused absences rank is associated with a statistically significant reduction in the number of applications among boys ($\hat{\beta} = -1.988$, $p < 0.01$), whereas the corresponding estimate for girls is small and not statistically significant.

Table 8 examines the impact of comparative noncognitive skills on the likelihood of admission to degree programs associated with the top quartile of expected salaries. Comparative noncognitive skills are a stronger driver of admission to high-earning programs among boys than among girls. Among all admitted students, a higher unexcused absences rank is associated with a statistically significant increase in the probability of enrolling in a high-earning program for boys ($\hat{\beta} = 0.051$, $p < 0.01$), while the corresponding estimate for girls is close to zero and not statistically significant.[12]

Next, I explore the impact of comparative noncognitive skills on expected labor-market outcomes, measured as the log expected salary of the degree program to which students are admitted. Table S13 shows that an increase in unexcused absences rank is associated with a statistically significant increase in log expected salary for boys ($\hat{\beta} = 0.040$, $p < 0.01$); the corresponding estimate for girls is small and not statistically significant ($\hat{\beta} = 0.002$, $p > 0.10$). Combining these slopes with gender differences in comparative noncognitive skills (mean rank of 0.494 for boys and 0.466 for girls), the comparative noncognitive trait channel predicts a gender gap of 0.0188 log points in expected salaries. Given that the observed gender gap is 0.051 log points, comparative noncognitive skills explain approximately 37 percent of the gap in expected salaries.[13]

[12]The estimated effect of comparative noncognitive skills on admission to high-earning programs is even larger when measured among all exam takers than among admitted boys (0.084 vs. 0.051; see Table S11). Table S12 reports estimates for the likelihood of university admission across all national exam participants. Among boys participating in the national exams, an increase in unexcused absences rank is associated with a statistically significant increase in admission probability ($\hat{\beta} = 0.099$, $p < 0.01$), while the corresponding estimate for girls remains close to zero and statistically not significant.

[13]To quantify the contribution of unexcused absences rank to the gender gap in expected log salaries, I consider two related calculations. First, I compute the combined contribution $\Delta = \hat{\beta}_B \bar{X}_B - \hat{\beta}_G \bar{X}_G$, where $\hat{\beta}_g$ and $\bar{X}_g$ denote the gender-specific regression coefficient and mean unexcused absences rank, respectively. Using the estimated coefficients (boys: 0.04; girls: 0.002) from Table S13 and mean ranks (0.494; 0.466), this yields $\Delta = 0.0188$. Dividing by the raw gender gap in log expected salaries (0.051) implies that the unexcused absences rank and its associated returns account for approximately 37 percent of the observed gap. This calculation reflects both differences in average standing and differences in returns. Second, I implement an Oaxaca–Blinder decomposition (Blinder, 1973; Oaxaca,

4.7 Comparative Cognitive vs. Noncognitive Skills

Table 9 investigates how students' comparative noncognitive skills (measured by their prior-year rank in unexcused absences) and comparative cognitive skills (measured by their prior-year rank in subject-specific performance) are associated with achievement in grade 10 Greek Language and Mathematics, allowing for gender-specific effects across alternative functional form specifications. In both Greek Language and Mathematics, an increase in unexcused absences rank is associated with statistically significant performance declines in the most flexible specification for both boys and girls (Greek: boys −0.059 SD, girls −0.065 SD; Math: boys −0.082 SD, girls −0.077 SD; all $p < 0.01$). Point estimates are similar across genders. In contrast, an increase in performance rank is associated with large achievement gains in both subjects and for both genders (Greek: boys 0.203 SD, girls 0.230 SD; Math: boys 0.168 SD, girls 0.282 SD; all $p < 0.01$). The estimated effects of performance rank are consistently larger for girls, especially in Mathematics. Overall, the estimated effects of performance rank are substantially larger than those of unexcused absences rank. The fact that the effect of unexcused absences rank remains similar in magnitude and statistically significant after controlling for prior performance rank suggests that the measure of comparative noncognitive skills captures a distinct driver of achievement that is not subsumed by students' comparative cognitive skills.

4.8 Nonlinear Effects

This section examines whether the effects of comparative noncognitive skills on subsequent achievement in STEM and non-STEM subjects are nonlinear. To do so, I replace the linear measure of unexcused absences rank with indicators for quantiles of within-classroom absence rank and interact these indicators with gender in a classroom fixed-effects specification. This approach yields separate estimates for each quantile, relative to the lowest quantile, for boys and girls.

Figure 5 shows a strongly nonlinear negative association between comparative noncognitive skills and non-STEM performance at the end of grade 10. For both boys (Panel A) and girls (Panel B), estimated effects are close to zero across the middle quantiles of unexcused absences rank but become sharply more negative in the upper tail. Students in the highest quantile experience the largest performance declines relative to the omitted (lowest) quantile. The steepest drop occurs

1973). Using the pooled coefficient on unexcused absences rank ($\hat{\beta}^* = 0.0185$), the endowment component equals $\hat{\beta}^*(\bar{X}_B - \bar{X}_G) = 0.00052$, which corresponds to approximately 1 percent of the total log salary gap. This indicates that most of the unexcused absences rank-related contribution arises from gender differences in returns rather than differences in average comparative standing.

between the fourth quantile and the upper quantiles. In contrast, Figure 6 reveals a more gradual and consistently declining gradient. Higher unexcused absences rank is associated with progressively lower STEM performance for both boys and girls. Negative effects emerge earlier in the distribution and accumulate across quantiles, and reach the largest performance losses for students in the highest quantile. This pattern suggests that comparative disengagement is more continuously predictive of STEM achievement than of non-STEM achievement.

4.9 Heterogeneous Effects

Table S16 reports the heterogeneous effects of comparative noncognitive skills on grade 10 performance by students' prior unexcused absences. In Greek Language, effects are concentrated among students with above-median prior unexcused absences. For these students, a one-decile increase in unexcused absences rank is associated with a decline in performance of about 0.08–0.10 standard deviations (boys: $\hat{\beta} = -0.103$, $p < 0.01$; girls: $\hat{\beta} = -0.085$, $p < 0.01$).

A similar pattern emerges in Mathematics. Among students with above-median prior unexcused absences, a one-decile increase in unexcused absences rank is associated with a decrease in performance of roughly 0.09 standard deviations (boys: $\hat{\beta} = -0.093$, $p < 0.01$; girls: $\hat{\beta} = -0.086$, $p < 0.05$). In contrast, estimated effects for students with below-median prior absences in both subjects are smaller and generally not statistically significant.

Table S17 reports the heterogeneous effects by prior academic achievement. In Greek Language, effects differ markedly by baseline performance. Among above-median prior achievers, a one-decile increase in unexcused absences rank has a negligible effect for boys but a significant negative effect for girls ($\hat{\beta} = -0.058$, $p < 0.01$). Among below-median prior achievers, higher unexcused absences rank is strongly associated with lower performance for both boys and girls (boys: $\hat{\beta} = -0.094$, $p < 0.01$; girls: $\hat{\beta} = -0.076$, $p < 0.01$).

In Mathematics, comparative noncognitive skills are negatively associated with performance across achievement groups. Among above-median prior achievers, a one-decile increase in rank reduces performance by about 0.06 standard deviations (boys: $\hat{\beta} = -0.063$, $p < 0.01$; girls: $\hat{\beta} = -0.062$, $p < 0.01$). Among below-median prior achievers, the decline is slightly larger, around 0.07–0.08 standard deviations (boys: $\hat{\beta} = -0.073$, $p < 0.01$; girls: $\hat{\beta} = -0.080$, $p < 0.01$).

4.10 Comparative Noncognitive Skills among Classmates of Same Gender

In this section, I follow Goulas et al. (2022) and test whether comparative noncognitive skills matter more for track choice when they are defined within same-gender peer groups. If adolescents predominantly benchmark their behavior against same-gender classmates, the mapping between behavioral engagement and educational pathways may be affected by gender-specific norms. This framework implies that the impact of a student's same-gender rank in unexcused absences on track choice should differ systematically between boys and girls.

I construct each student's unexcused absences rank separately for boys and girls within each classroom. Table S19 shows that, in the most flexible specification, an increase in same-gender unexcused absences rank has opposite effects on boys' and girls' track choices. For the competitive STEM track, higher same-gender unexcused absences rank has a small and statistically not significant effect for boys ($\hat{\beta} = 0.010$), but significantly reduces the probability of choosing the competitive STEM track for girls ($\hat{\beta} = -0.040$, $p < 0.01$). In contrast, for the noncompetitive STEM track, higher same-gender unexcused absences rank significantly reduces boys' participation ($\hat{\beta} = -0.161$, $p < 0.01$) while increasing girls' participation ($\hat{\beta} = 0.123$, $p < 0.01$).

These findings suggest that comparative disengagement within same-gender peer environments may shift boys and girls toward different educational pathways. Higher relative disengagement is associated with boys who move away from STEM tracks altogether, whereas for girls it is associated with substitution away from the competitive STEM track and toward the noncompetitive STEM track.

4.11 Comparative Noncognitive Skills with Respect to School Cohort

This section investigates the impact of comparative noncognitive skills computed within a student's school cohort instead of the classroom. I exploit variation that arises from the dispersion of unexcused absences within different cohorts in the same school. Within-cohort rank captures a broader social benchmark and helps assess whether the comparative absence signal operates primarily through immediate classroom interactions or through more general within-school sorting and norms. The outcome variables I focus on are competitive and noncompetitive STEM track choices after grade 10. Table S20 shows that an increase in within-cohort unexcused absences rank has essentially no effect on competitive STEM track choice for either boys or girls (boys: -0.003; girls: -0.002; both statistically not significant). In contrast, within-cohort comparative absenteeism significantly increases selection into the noncompetitive STEM track for both genders (boys: 0.018, $p < 0.01$; girls: 0.013, $p < 0.01$), with the estimated effect modestly larger for boys. These results suggest that comparative signals operate most strongly within the immediate classroom context, though broader within-school rankings still shape sorting into less the competitive STEM track.

5 Robustness Checks

5.1 Main Sample Attrition

Section 4.4 showed that comparative noncognitive skills are associated with subsequent transitions out of the regular academic track, particularly among boys (Tables 6 and S10). This section presents robustness exercises to assess the importance of selective survival in the regular public schools.

First, I re-estimate the main specification using inverse probability weights (IPW) that account for differential survival into later grades. I estimate the probability of remaining enrolled in regular public school as a function of comparative noncognitive skills, gender, baseline academic performance, and the full set of controls included in equation 2, and weight subsequent regressions by the inverse of the predicted survival probability. Results for grade 11 performance are reported in Table S21 and for track choices in Tables S22 and S23.

Across outcomes, the IPW estimates closely mirror the baseline results both qualitatively and quantitatively. For grade 11 performance, the estimated effects remain negative and statistically significant for both boys and girls in Greek Language and Mathematics, with magnitudes slightly larger under IPW (e.g., in the most flexible specification, -0.125 vs. -0.081 for boys in Greek and -0.161 vs. -0.120 in Mathematics).

Similarly, results for track choice are essentially unchanged. For the competitive STEM track, higher comparative disengagement (i.e., a higher unexcused absences rank) continues to have little effect for boys but significantly reduces participation for girls. For noncompetitive STEM tracks, comparative disengagement remains strongly negatively associated with participation for boys and positively associated for girls, with magnitudes very similar to the baseline estimates. Estimates for non-STEM track choice also preserve the same directional patterns and comparable sizes.

Second, I incorporate dropout directly into the long-run expected-earnings outcome by defining a composite measure that assigns the lowest observed outcome value to students who exit the regular public school system after grade 10. This specification treats dropout as an adverse educational realization and provides a conservative lower-bound robustness check for the estimated effects. Estimates using this composite outcome (Table S24) yield patterns closely consistent with the baseline results. In particular, the positive association between comparative disengagement and expected earnings for boys remains statistically significant, while the corresponding estimates for girls remain small and statistically insignificant. As expected under this conservative specification, the magnitudes are attenuated relative to the baseline, but the qualitative gender differences persist, which indicates that selective main sample attrition into later educational stages is unlikely to influence the main findings.

5.2 Alternative Definition of Comparative Noncognitive Skills

To assess whether the findings depend on how comparative noncognitive skills are constructed, I reestimate the main specifications using an alternative measure based on each student's classroom rank in the mean of unexcused absences across middle school grades (i.e., grades 7 through 9) rather than unexcused absences in grade 9. This measure captures comparative disengagement accounts for year-related shocks that many obscure the measure of noncognitive skills. Results are reported in Table S25 and are consistent with the main findings of Table 3. In Greek Language, the most flexible specification yields negative and precisely estimated coefficients of -0.176 for boys and -0.156 for girls (both $p < 0.01$). Effects are smaller in Mathematics, where the corresponding coefficients are -0.096 for boys and -0.099 for girls (both $p < 0.01$).

5.3 Imperfect Measurement of Comparative Noncognitive Skills

One potential concern is that unexcused absences aggregate heterogeneous forms of nonattendance and disciplinary incidents,[14] so a given level of recorded absences may correspond to different underlying behavioral traits or school-context dynamics across students. As a result, our constructed measure of comparative noncognitive skills should be interpreted as an observed signal of students' relative behavioral standing rather than a perfectly measured latent trait. Moreover, because report cards do not formally report students' rank relative to classmates along these dimensions, students themselves must infer their standing from informal feedback and social interactions, which may introduce additional noise in perceived signals.

To assess the sensitivity of the findings to imperfect measurement in unexcused absences, a data-driven noise-contamination exercise is implemented. The observed grade 9 absences are perturbed using two approaches. Under additive contamination, mean-zero random shocks scaled to a fraction of the sample standard deviation of absences are added to each student's observed value. Under multiplicative contamination, absences are rescaled by a random factor centered at one, with the variance of the factor increasing with the specified noise level. This enables the recorded value

[14] In particular, unexcused absences capture disciplinary removals such as suspensions and truancy resulting from infractions of varying severity. This categorization is not unique to the educational setting under study. In US public schools, for example, suspensions are frequently imposed for broad, subjective categories such as "disruptive," "insubordinate," or "defiant" behavior, which encompass minor classroom noncompliance and failure to follow teacher instructions (Butrymowicz et al., 2024).

to be proportionally overstated or understated. The two contamination schemes capture both level-independent measurement error (additive) and proportional reporting distortions (multiplicative).

For each noise level and contamination approach, 400 Monte Carlo replications are performed. In each replication, a new perturbed absences measure is generated, students' within-classroom rank based on the contaminated measure is recomputed, and the main specification is re-estimated. The resulting distribution of coefficients provides a direct assessment of how sensitive the estimated effects of comparative noncognitive skills are to plausible levels of both additive and proportional measurement error.

Figures S8 and S9 show that the estimated effects of comparative noncognitive skills remain negative and economically meaningful even under substantial measurement contamination. As the magnitude of added noise increases, the estimates attenuate gradually toward zero, as expected under classical measurement error, but remain clearly distinguishable from zero even at high noise levels. This pattern holds for both subjects and for both male and female students. These results indicate that the main estimates are robust to sizable perturbations in the underlying absences measure.

6 Mechanisms

Section 4 demonstrates the short- and long-run effects of comparative noncognitive skills. This section discusses the pathways that underpin these findings. To investigate potential mechanisms, I use a survey-based experiment on 344 teachers that randomly exposes teachers to different scenarios that describe a new student transferring into their class, and vary the student's comparative cooperativeness (cooperative vs. uncooperative).[15] The scenarios hold academic performance and attendance constant.

Conditional on the assigned profile, teachers evaluated the student using Likert-type items to capture expected learning motivation, self-regulation, academic performance, and behavior or attendance problems, as well as the likelihood that the student would acquire a negative or persistent reputation. Teachers also reported intended responses; the options were regular communication, early parental contact, and the likelihood of formal disciplinary action. Participants then assessed the extent to which potential problems and subsequent improvements in behavior or performance would be attributed to student effort and self-regulation, peer relations, instructional practices, or

[15] Table S26 presents summary statistics for survey participants' main characteristics. The results indicate balance in the characteristics of respondents exposed to the different student profiles.

out-of-school factors.[16] The primary estimand is the average difference in teachers' expectations and intended responses across the two randomly assigned student profiles. The full questionnaire is available in Online Appendix Section S5.

6.1 Why Do Comparative Noncognitive Skills Have Lasting Effects?

A key finding is that a higher (worse) unexcused absences rank at the beginning of grade 10 predicts higher unexcused absences through grades 10–12. This persistence is suggestive of two broad mechanisms. First, through an *intrinsic* channel, students' beliefs about fit and effort choices respond to how individuals perceive their behavioral standing relative to peers (Akerlof and Kranton, 2002). Experimental evidence shows that perceptions of relative position influence behavior and effort independent of absolute ability or performance (Breza et al., 2018; Card et al., 2012).

Second, through an *extrinsic* channel, comparative disengagement may affect teachers' expectations and institutional responses in ways that reinforce initial behavioral differences and channel students into distinct educational paths (Thomas and Thomas, 1928). In this case, the school environment may respond more punitively or with heightened scrutiny for similar conduct and thereby amplify early disparities. In Bourdieu and Passeron's terms, schools function as "structured structures predisposed to function as structuring structures," and generate labels and classifications that influence beliefs, expectations, and subsequent behavior (Bourdieu and Passeron, 1990). These intrinsic and extrinsic channels are not mutually exclusive. Institutional responses may become internalized by students (Papageorge et al., 2020; Schmader et al., 2008; Steele, 1997; Suen, 2004). Thus, self-perceptions and others' perceptions may evolve jointly and reinforce one another over time. These mechanisms may be particularly salient for girls, for whom social expectations of diligence and compliance are stronger. Deviations from these norms can heighten perceived incongruence with gendered role identities and increase sensitivity to evaluation and self-doubt (Bian et al., 2017; Spencer et al., 1999).

Evidence from the survey-based experiment provides direct support for both intrinsic and extrinsic channels (see Table S27). Teachers perceive comparatively uncooperative students as substantially more likely to exhibit weak self-control and poor organization ($D = 3.991$, $p < 0.001$), weak motivation for learning ($D = 2.881$, $p < 0.001$), and elevated risks of behavioral, attendance, and academic problems over the school year ($p < 0.001$ across domains). In addition, teachers

[16] Finally, to elicit teachers' perceived challenges in student management, the survey included an open-ended question that asked respondents to describe the primary issue that would concern them most when managing the student presented in the vignette. Appendix Section S3 reports the results of an unsupervised topic-modeling analysis using BERTopic applied to teachers' text responses.

report a higher likelihood that such students will be perceived as "bad students," acquire reputations that are difficult to revise, and have minor incidents interpreted more negatively. These patterns indicate that comparative noncognitive labels operate as broad signals that affect teachers' holistic assessments and intended responses rather than isolated judgments about behavior.

6.2 Sticky Labels and the Causal Attribution of Success and Failure

Labels function as interpretive frames. Once a student is classified as (comparatively) uncooperative, subsequent behavior and outcomes are filtered through that classification. Teachers play a key role in this process. They act as institutional gatekeepers, translating observed behavior into durable classifications that organize classroom hierarchies and guide responses to students. Examining causal attributions is therefore informative, because they reveal how educators interpret new information once a label is in place—specifically, whether success or failure is understood as evidence of the student's own agency or as the product of external circumstances. If labels are sticky, improvements will not fully restore perceived agency. When agency is persistently shifted away from the student, teachers may lower expectations for self-directed improvement, lean more heavily on external explanations, or adjust teaching in ways that limit opportunities for growth.

Tables S28 and S29 examine how comparative noncognitive labels influence teachers' causal attributions. Table S28 focuses on behavioral and attendance outcomes, and Table S29 examines academic performance. When students are labeled as uncooperative, teachers systematically shift attributions for outcome deterioration toward the student and the classroom. In both the behavioral/attendance and academic domains, worsening outcomes are increasingly attributed to students' low effort or motivation ($D = 0.448$, $p < 0.05$; $D = 0.361$, $p < 0.05$) and weak self-regulation ($D = 0.533$, $p < 0.01$; $D = 0.365$, $p < 0.05$), as well as to teachers' practices and classroom management ($D = 0.422$, $p < 0.01$; $D = 0..19$, $p < 0.05$). In contrast, labeling is not associated with significantly different attributions to peer relationships or the family environment when outcomes worsen.

Attribution patterns differ markedly for outcome improvement. When the behavior or attendance of an uncooperative student improves, teachers are significantly more likely to credit peer relationships ($D = 0.302$, $p < 0.05$); attributions to student effort, motivation, or self-regulation remain largely unchanged. Similarly, improvements in academic performance by uncooperative students are more strongly attributed to factors outside the school, such as the family environment ($D = 0.375$, $p < 0.05$). Overall, improvements in either behavioral or academic outcomes do not restore perceptions of student agency. By systematically shifting agency away from the student and toward contextual explanations, comparative noncognitive labels appear highly persistent. This suggests that they are a key mechanism through which comparative standing generates durable and self-reinforcing differences in educational trajectories.[17]

Institutional labeling may, in turn, generate heterogeneous student responses. Once teachers revise expectations and shift agency away from the student, the classroom environment changes. Students may internalize these signals and update their own beliefs about their competence and prospects. For some, negative comparative standing may generate status threat and induce more competitive or risk-taking educational choices; for others, diminished perceived agency may reduce effort or redirect aspirations toward less demanding pathways. In all cases, the initial impulse originates in teachers' beliefs.

6.3 Theoretical Implications

The evidence in Section 6 that teachers classify students and, through social labeling, differentially allocate growth opportunities challenges standard conceptions of teacher effectiveness. In conventional models, teacher effectiveness enters the education production function as a uniform input, assuming that teachers do not systematically vary opportunities across students.[18] Specifically, teacher effectiveness may also depend on how teachers allocate attention across students based on beliefs about their underlying traits. Under this view, comparative noncognitive skills may affect the informational environment in which teachers form expectations about students' responsiveness to educational investment. As a result, teacher effectiveness becomes endogenous to student classification: The same teacher may be highly effective for some students and less effective for others, not because of differences in pedagogy, but because of belief-driven differences in investment.

These implications align with models of task assignment under imperfect information (Sattinger, 1975, 1993), in which agents are allocated to environments with different growth potential based on expected productivity. Section S4 outlines a model in which teachers face an assignment problem in which they allocate attention across students based on comparative signals rather than observed output, with consequences for the accumulation of human capital.

If teachers allocate learning tasks based on perceived student engagement, the achievement

[17] Appendix Section S3 analyzes teachers' open-ended responses to the survey vignette using an unsupervised topic-modeling approach (BERTopic). The results in Table S30 indicate that uncooperative behavior shifts teachers' concerns toward underlying behavioral and psychological explanations, whereas cooperative students are more often associated with situational adjustment concerns; notably, there is no corresponding shift toward attributing uncooperativeness to deficits in motivation, family background, or communication.

[18] Departures from uniformity arise in work on teacher–student match quality (Bettinger and Long, 2005; de Gendre et al., 2024; Egalite et al., 2015; Gershenson et al., 2021, 2022, 2016; Harbatkin, 2021; Lim and Meer, 2020).

penalty associated with comparative disengagement should vary with the productivity of the learning environment (a scale-of-operations effect). When instruction operates through separable components, access to higher-quality tasks should yield larger learning gains, and thus exclusion from such tasks should be especially costly. By contrast, under a cumulative learning technology, gains depend primarily on mastery of prerequisite material, which implies that access to more advanced tasks need not increase returns. Literacy acquisition is often modeled as involving separable component skills (Scarborough et al., 2009), whereas numeracy acquisition is typically viewed as cumulative and dependent on prior knowledge (Siegler and Braithwaite, 2017).

Table S18 tests this implication by allowing the effects of comparative noncognitive skills to vary with school-level average achievement growth between grades 9 and 10. In Greek Language, disengagement penalties are larger in above-median-growth schools, consistent with exclusion from environments in which instructional returns are highest. In Mathematics, by contrast, penalties are largest in below-median-growth schools, consistent with a cumulative learning process in which weaker environments amplify the costs of falling behind in prerequisite mastery. Overall, these patterns indicate that the costs of comparative disengagement are both environment-dependent and subject-specific, consistent with task allocation operating under different instructional technologies.

7 Conclusion

This is the first study to show that relative standing in noncognitive skills has lasting effects on student outcomes, independent of both absolute skill levels and cognitive achievement. Specifically, students who are quasi-randomly assigned to classrooms with more behaviorally engaged peers at the start of high school, proxied by lower middle-school unexcused absences, have worse academic performance and higher absence rates throughout high school than those assigned to less engaged peer groups, ceteris paribus. The nonlinear estimates indicate that the penalties are concentrated in the upper tail of the comparative noncognitive skill distribution.

The paper documents pronounced gender asymmetries in how comparative noncognitive skills translate into both short-run academic outcomes and longer-run educational trajectories. In the short run, during grades 10 and 11, comparative noncognitive standing is associated with lower performance in both mathematics and Greek for boys and girls alike. These achievement effects precede formal specialization decisions. Starting at grade 11, however, sorting patterns diverge by gender. Comparative disengagement predicts stronger sorting into vocational schools for girls. In subsequent track choice, comparative disengagement is associated with sorting into more competitive tracks for boys and into less competitive tracks for girls. Consistent with this divergence, comparative disengagement is also linked to a higher likelihood of participating in national examinations, and to higher exam performance, among boys only.

These gender-specific responses extend into postsecondary decisions. Among boys, comparative disengagement is associated with a greater number of applications to high-earning degree programs and a higher probability of admission to such programs. No comparable association emerges for girls. Overall, the evidence indicates that comparative behavioral signals widen the dispersion of male trajectories—simultaneously increasing exit risk for some students while strengthening competitive academic engagement among those who remain—whereas female trajectories adjust primarily through within-system sorting toward less competitive tracks. Combining these gender-specific gradients with observed differences in comparative disengagement implies that this channel accounts for roughly 37 percent of the gender gap in expected earnings at college entry.

Evidence from a complementary survey-based experiment suggests that institutions translate comparative signals into differential expectations and treatment. Teachers systematically revise beliefs about motivation, self-control, and future problems when students are labeled as comparatively uncooperative, and they adjust disciplinary and monitoring responses accordingly. Importantly, teachers are also less likely to attribute improvements to student agency for such students. This suggests a feedback process through which comparative labels can persistently affect trajectories.

A key implication therefore is that the persistence of behavioral signals may reflect teacher classification and informal labeling rather than immutable student traits. Another implication is that measures of teacher effectiveness that abstract from within-classroom heterogeneity may understate the role of belief formation and student classification in shaping educational trajectories. Policies that limit reliance on behavioral comparisons and classification may thus improve long-run educational trajectories. From a theory perspective, the findings point to models of belief-driven opportunity provision, in which teacher expectations influence the allocation of attention, challenge, and access to higher-return learning opportunities. More fundamentally, this study suggests that educational inequality may arise not only from who students are, but from how institutions interpret behavioral signals and translate them into opportunity.

References

Abadie, A., S. Athey, G. W. Imbens, and J. M. Wooldridge (2023). When Should You Adjust Standard Errors for Clustering? *Quarterly Journal of Economics 138*(1), 1–35.

Ackerman, P. L. and E. D. Heggestad (1997). Intelligence, Personality, and Interests: Evidence for Overlapping Traits. *Psychological Bulletin 121*(2), 219–245.

Akerlof, G. A. and R. E. Kranton (2002). Identity and Schooling: Some Lessons for the Economics of Education. *Journal of Economic Literature 40*(4), 1167–1201.

Algan, Y., E. Beasley, S. Côté, J. Park, R. E. Tremblay, and F. Vitaro (2022). The Impact of Childhood Social Skills and Self-control Training on Economic and Noneconomic Outcomes: Evidence from a Randomized Experiment Using Administrative Data. *American Economic Review 112*(8), 2553–2579.

Almlund, M., A. L. Duckworth, J. Heckman, and T. Kautz (2011). Personality Psychology and Economics. In *Handbook of the Economics of Education*, Volume 4, pp. 1–181. Elsevier.

Bertoni, M. and R. Nisticò (2023). Ordinal Rank and the Structure of Ability Peer Effects. *Journal of Public Economics 217*, 104797.

Bettinger, E. P. and B. T. Long (2005). Do Faculty Serve as Role Models? The Impact of Instructor Gender on Female Students. *American Economic Review 95*(2), 152–157.

Bian, L., S.-J. Leslie, and A. Cimpian (2017). Gender Stereotypes About Intellectual Ability Emerge Early and Influence Children's Interests. *Science 355*(6323), 389–391.

Blau, F. D. and L. M. Kahn (2017). The Gender Wage Gap: Extent, Trends, and Explanations. *Journal of Economic Literature 55*(3), 789–865.

Blinder, A. S. (1973). Wage Discrimination: Reduced Form and Structural Estimates. *Journal of Human Resources 8*(4), 436–455.

Bourdieu, P. and J.-C. Passeron (1990). *Reproduction in Education, Society and Culture*, Volume 4. Sage.

Bowles, S., H. Gintis, et al. (1976). *Schooling in Capitalist America*, Volume 57. New York: Basic Books.

Bowles, S., H. Gintis, and M. Osborne (2001). The Determinants of Earnings: A Behavioral Approach. *Journal of Economic Literature 39*(4), 1137–1176.

Breza, E., S. Kaur, and Y. Shamdasani (2018). The Morale Effects of Pay Inequality. *Quarterly Journal of Economics 133*(2), 611–663.

Bronfenbrenner, U. (1979). *The Ecology of Human Development: Experiments by Nature and Design.* Harvard University Press.

Brox, E., M. Davoli, and M. Strazzeri (2025). Classroom Rank in Math, Occupational Choices and Labor Market Outcomes. Technical report, Kiel, Hamburg: ZBW-Leibniz Information Centre for Economics.

Butrymowicz, S., F. Khan, and M. Kolodner (2024, March). Vague School Rules at the Root of Millions of Student Suspensions. Technical report, Hechinger Report.

Byrnes, J. P., D. C. Miller, and W. D. Schafer (1999). Gender Differences in Risk Taking: A Meta-analysis. *Psychological Bulletin 125*(3), 367.

Campos, A., P. Carneiro, Y. Cruz-Aguayo, and S. Norbert (2021). Interactions: Do Teacher Behaviors Predict Achievement, Executive Function, and Non-cognitive Outcomes in Elementary School. Technical report, London, UK: University College London.

Card, D., A. Mas, E. Moretti, and E. Saez (2012). Inequality at Work: The Effect of Peer Salaries on Job Satisfaction. *American Economic Review 102*(6), 2981–3003.

Carneiro, P., Y. Cruz-Aguayo, F. Salvati, and N. Schady (2025a). Disruption in the Classroom: Experimental Evidence from Ecuador. Technical report, Inter-American Development Bank.

Carneiro, P., Y. Cruz-Aguayo, F. Salvati, and N. Schady (2025b). The Effect of Classroom Rank on Learning Throughout Elementary School: Experimental Evidence from Ecuador. *Journal of Labor Economics 43*(2), 433–466.

Clarke, D., J. P. Romano, and M. Wolf (2020). The Romano–Wolf Multiple-hypothesis Correction in Stata. *Stata Journal 20*(4), 812–843.

Claro, S., D. Paunesku, and C. S. Dweck (2016). Growth Mindset Tempers the Effects of Poverty on Academic Achievement. *Proceedings of the National Academy of Sciences 113*(31), 8664–8668.

Crone, E. A. and R. E. Dahl (2012). Understanding Adolescence as a Period of Social–Affective Engagement and Goal Flexibility. *Nature Reviews Neuroscience 13*(9), 636–650.

Cunha, F. and J. Heckman (2007). The Technology of Skill Formation. *American Economic Review 97*(2), 31–47.

de Gendre, A., J. Feld, N. Salamanca, and U. Zölitz (2024). Same-sex Teacher Effects. Technical report, Working Paper, R&R in Review of Economic Studies.

Del Bono, E., A. Holford, and T. Sartori (2025). Beyond Test Scores: How Academic Rank Shapes Long-Term Outcomes. Technical report, arXiv preprint arXiv:2510.11973.

Delaney, J. M. and P. J. Devereux (2022). Rank Effects in Education: What Do we Know so Far? In *Handbook of Labor, Human Resources and Population Economics*, pp. 1–24. Springer.

Deming, D. J. (2017). The Growing Importance of Social Skills in the Labor Market. *Quarterly Journal of Economics 132*(4), 1593–1640.

Denning, J. T., R. Murphy, and F. Weinhardt (2023). Class Rank and Long-run Outcomes. *Review of Economics and Statistics 105*(6), 1426–1441.

DeYoung, C. G. (2010). Personality Neuroscience and the Biology of Traits. *Social and Personality Psychology Compass 4*(12), 1165–1180.

Dickens, W. T. and J. R. Flynn (2001). Heritability Estimates Versus Large Environmental Effects: The IQ Paradox Resolved. *Psychological Review 108*(2), 346–369.

Duckworth, A. L. and D. S. Yeager (2015). Measurement Matters: Assessing Personal Qualities Other Than Cognitive Ability for Educational Purposes. *Educational Researcher 44*(4), 237–251.

Egalite, A. J., B. Kisida, and M. A. Winters (2015). Representation in the Classroom: The Effect of Own-race Teachers on Student Achievement. *Economics of Education Review 45*, 44–52.

Elsner, B. and I. E. Isphording (2017). A Big Fish in a Small Pond: Ability Rank and Human Capital Investment. *Journal of Labor Economics 35*(3), 787–828.

Elsner, B. and I. E. Isphording (2018). Rank, Sex, Drugs, and Crime. *Journal of Human Resources 53*(2), 356–381.

Elsner, B., I. E. Isphording, and U. Zölitz (2021). Achievement Rank Affects Performance and Major Choices in College. *Economic Journal 131*(640), 3182–3206.

Fuchs, L., P. Pinger, and P. Seegers (2025). Relative Grades and Gender Differences in STEM Enrollment. Technical report, University of Bonn and University of Mannheim, Germany.

Gardner, M. and L. Steinberg (2005). Peer Influence on Risk Taking, Risk Preference, and Risky Decision Making in Adolescence and Adulthood: An Experimental Study. *Developmental Psychology 41*(4), 625.

Gershenson, S., M. Hansen, and C. A. Lindsay (2021). *Teacher Diversity and Student Success: Why Racial Representation Matters in the Classroom*. Cambridge, MA: Harvard Education Press.

Gershenson, S., C. M. Hart, J. Hyman, C. A. Lindsay, and N. W. Papageorge (2022). The Long-run Impacts of Same-race Teachers. *American Economic Journal: Economic Policy 14*(4), 300–342.

Gershenson, S., S. B. Holt, and N. W. Papageorge (2016). Who Believes in Me? The Effect of Student–Teacher Demographic Match on Teacher Expectations. *Economics of Education Review 52*, 209–224.

Goulas, S., S. Griselda, and R. Megalokonomou (2022). Comparative Advantage and Gender Gap in STEM. *Journal of Human Resources 59*(6), 1937–1980.

Goulas, S., B. Gunawardena, R. Megalokonomou, and Y. Zenou (2024). Gender Role Models in Education. Technical report, *CEPR Discussion Paper No. 19432*.

Goulas, S. and R. Megalokonomou (2020). School Attendance During a Pandemic. *Economics Letters 193*, 109275.

Hajovsky, D. B., J. M. Caemmerer, and B. A. Mason (2022). Gender Differences in Children's Social Skills Growth Trajectories. *Applied Developmental Science 26*(3), 488–503.

Harbatkin, E. (2021). Does Student-Teacher Race Match Affect Course Grades? *Economics of Education Review 81*, 102081.

Heckman, J. J. and T. Kautz (2012). Hard Evidence on Soft Skills. *Labour Economics 19*(4), 451–464.

Heckman, J. J. and Y. Rubinstein (2001). The Importance of Noncognitive Skills: Lessons From the GED Testing Program. *American Economic Review 91*(2), 145–149.

Heckman, J. J., J. Stixrud, and S. Urzua (2006). The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior. *Journal of Labor Economics 24*(3), 411–482.

Jackson, C. K. (2012). Non-cognitive Ability, Test Scores, and Teacher Quality: Evidence from 9^{th} Grade Teachers in North Carolina. Technical report, National Bureau of Economic Research.

John, O. P. and S. Srivastava (1999). The Big Five trait taxonomy: History, Measurement, and Theoretical Perspectives. In L. A. Pervin and O. P. John (Eds.), *Handbook of Personality: Theory and Research*, pp. 102–138. Guilford Press.

Kautz, T., J. J. Heckman, R. Diris, B. Ter Weel, and L. Borghans (2014). Fostering and Measuring Skills: Improving Cognitive and Non-cognitive Skills to Promote Lifetime Success. Technical report, National Bureau of Economic Research.

Kautz, T. and W. Zanoni (2024). Measurement and Development of Noncognitive Skills in Adolescence: Evidence from Chicago Public Schools and the OneGoal Program. *Journal of Human Capital 18*(2), 272–304.

Larivière, J. (2025). From Rank to Label: How Early Academic Rank Shapes Educational Diagnoses and Mental Health Outcomes. Technical report, Munich Personal RePEc Archive.

Lavy, V. and R. Megalokonomou (2024). Alternative Measures of Teachers' Value Added and Impact on Short and Long-Term Outcomes: Evidence From Random Assignment. Technical report, NBER Working Paper, No. 32671.

Lim, J. and J. Meer (2020). Persistent Effects of Teacher–Student Gender Matches. *Journal of Human Resources 55*(3), 809–835.

MacCann, C., Y. Jiang, L. E. Brown, K. S. Double, M. Bucich, and A. Minbashian (2020). Emotional Intelligence Predicts Academic Performance: A Meta-analysis. *Psychological Bulletin 146*(2), 150–186.

McCoy, S. S., L. M. Dimler, D. V. Samuels, and M. N. Natsuaki (2019). Adolescent Susceptibility to Deviant Peer Pressure: Does Gender Matter? *Adolescent Research Review 4*(1), 59–71.

McCrae, R. R. and P. T. Costa (1994). Toward a New Generation of Personality Theories: Theoretical Contexts for the Five-factor Model. *In R. Hogan, J. Johnson, & S. Briggs (Eds.), Handbook of Personality Psychology 51*, 139–153.

Megalokonomou, R. and Y. Zhang (2024). How Good Am I? Effects and Mechanisms Behind Salient Rank. *European Economic Review 170*, 104870.

Mischel, W. (1968). *Personality and Assessment.* New York: John Wiley & Sons.

Mischel, W., O. Ayduk, M. G. Berman, B. Casey, I. H. Gotlib, J. Jonides, E. Kross, T. Teslovich, N. L. Wilson, V. Zayas, et al. (2011). "Willpower""' Over the Life Span: Decomposing Self-regulation. *Social Cognitive and Affective Neuroscience 6*(2), 252–256.

Mischel, W. and Y. Shoda (1995). A Cognitive-Affective System Theory of Personality: Reconceptualizing Situations, Dispositions, Dynamics, and Invariance in Personality Structure. *Psychological Review 102*(2), 246.

Mishler, E. (1979). Meaning in Context: Is There Any Other Kind? *Harvard Educational Review 49*(1), 1–19.

Murphy, R. and F. Weinhardt (2020). Top of the Class: The Importance of Ordinal Rank. *Review of Economic Studies 87*(6), 2777–2826.

Oaxaca, R. (1973). Male-female Wage Differentials in Urban Labor Markets. *International Economic Review 14*(3), 693–709.

OECD (2018). *Education for a Bright Future in Greece.* Organisation for Economic Co-operation and Development.

Owen, A. L. (2010). Grades, Gender, and Encouragement: A Regression Discontinuity Analysis. *Journal of Economic Education 41*(3), 217–234.

Palma, M. (2025). Academic Rank, Socioeconomic Rank, and Educational Outcomes: Longitudinal Evidence from Chile. *Education Economics 33*(3), 311–332.

Papageorge, N. W., S. Gershenson, and K. M. Kang (2020). Teacher Expectations Matter. *Review of Economics and Statistics 102*(2), 234–251.

Poropat, A. E. (2009). A Meta-analysis of the Five-factor Model of Personality and Academic Performance. *Psychological Bulletin 135*(2), 322–338.

Ridgeway, C. L. (2014). Why Status Matters for Inequality. *American Sociological Review 79*(1), 1–16.

Roberts, B. W. and W. F. DelVecchio (2000). The Rank-Order Consistency of Personality Traits from Childhood to Old Age: A Quantitative Review of Longitudinal Studies. *Psychological Bulletin 126*(1), 3.

Romano, J. P. and M. Wolf (2005). Stepwise Multiple Testing as Formalized Data Snooping. *Econometrica 73*(4), 1237–1282.

Rosenthal, R. and L. Jacobson (1968). Pygmalion in the Classroom. *Urban Review 3*(1), 16–20.

Rutter, M. (2006). *Genes and Behavior: Nature-nurture Interplay Explained.* Oxford, UK: Blackwell Publishing.

Sattinger, M. (1975). Comparative Advantage and the Distributions of Earnings and Abilities. *Econometrica: Journal of the Econometric Society 43*(3), 455–468.

Sattinger, M. (1993). Assignment Models of the Distribution of Earnings. *Journal of Economic Literature 31*(2), 831–880.

Sawyer, S. M., P. S. Azzopardi, D. Wickremarathne, and G. C. Patton (2018). The Age of Adolescence. *Lancet Child & Adolescent Health 2*(3), 223–228.

Scarborough, H. S., S. Neuman, and D. Dickinson (2009). Connecting Early Language and Literacy to Later Reading (Dis) abilities: Evidence, Theory, and Practice. *Approaching Difficulties in Literacy Development: Assessment, Pedagogy and Programmes 10*, 23–38.

Schmader, T., M. Johns, and C. E. Forbes (2008). An Integrated Process Model of Stereotype Threat Effects on Performance. *Psychological Review 115*(2), 336–356.

Shanahan, M.-C. and M. Nieswandt (2011). Science Student Role: Evidence of Social Structural Norms Specific to School Science. *Journal of Research in Science Teaching 48*(4), 367–395.

Siegler, R. S. and D. W. Braithwaite (2017). Numerical Development. *Annual Review of Psychology 68*, 187–213.

Somerville, L. H., R. M. Jones, and B. Casey (2010). A Time of Change: Behavioral and Neural Correlates of Adolescent Sensitivity to Appetitive and Aversive Environmental Cues. *Brain and Cognition 72*(1), 124–133.

Sorrenti, G., U. Zölitz, D. Ribeaud, and M. Eisner (2025). The Causal Impact of Socio-emotional Skills Training on Educational Success. *Review of Economic Studies 92*(1), 506–552.

Spencer, S. J., C. M. Steele, and D. M. Quinn (1999). Stereotype Threat and Women's Math Performance. *Journal of Experimental Social Psychology 35*(1), 4–28.

Stankov, L. (2005). Personality and Intelligence: The Relationship of Eysenck's Giant Three with Psychometric and Academic Measures of Intelligence. *Personality and Individual Differences 39*(3), 555–567.

Steele, C. M. (1997). A Threat in the Air: How Stereotypes Shape Intellectual Identity and Performance. *American Psychologist 52*(6), 613–629.

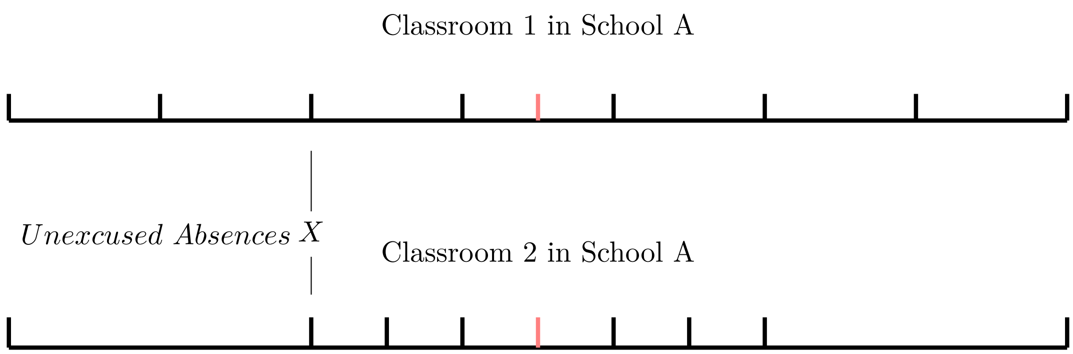
Steinberg, L. (2017). A Social Neuroscience Perspective on Adolescent Risk-taking. In *Biosocial Theories of Crime*, pp. 435–463. Routledge.

Suen, W. (2004). The Self-perpetuation of Biased Beliefs. *Economic Journal 114*(495), 377–396.

Thomas, W. and D. Thomas (1928). *The Child in America: Behavior Problems and Programs.* New York: Alfred A. Knopf.

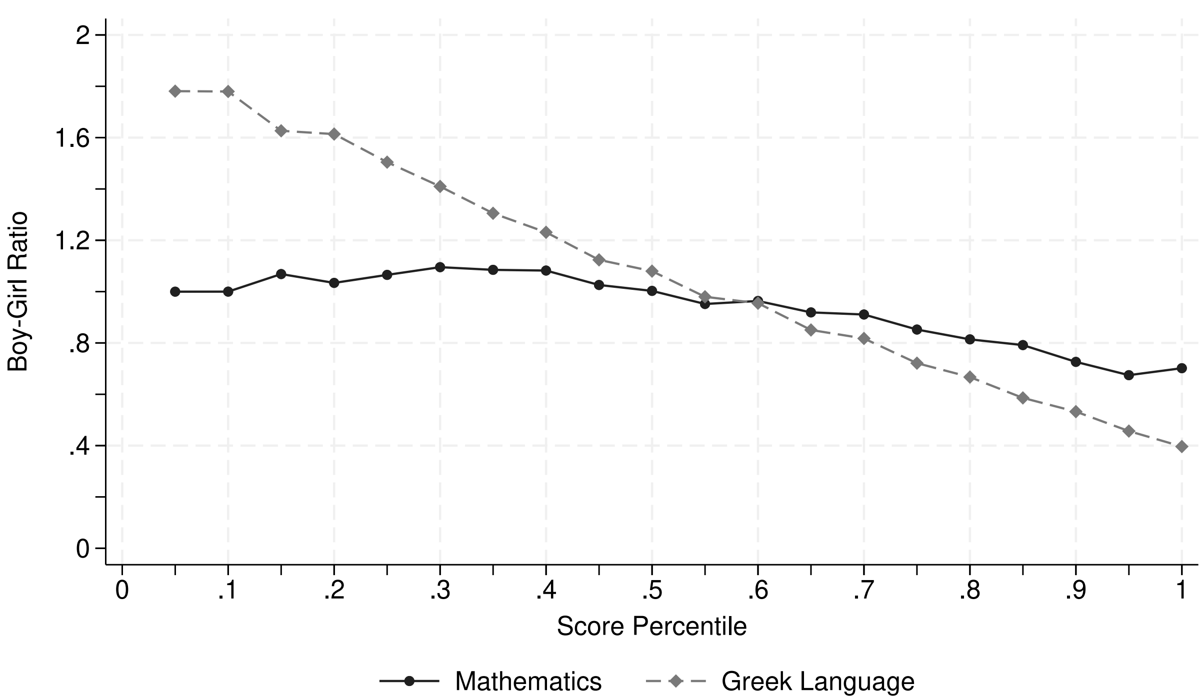
Webb, E. (1915). *Character and Intelligence: An Attempt at an Exact Study of Character.* Cambridge, UK: Cambridge University Press.

Figure 1: Identifying Variation in Peers' Dispersion of Noncognitive Skills



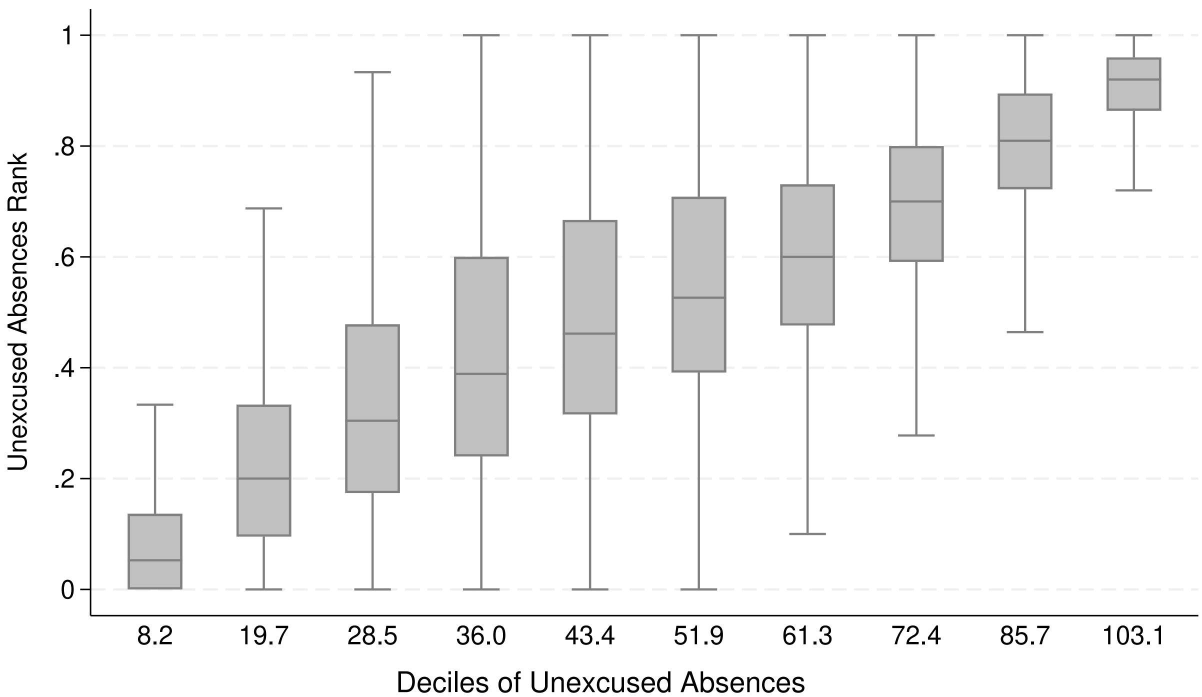
Notes: This figure illustrates the variation I exploit to identify the effect of unexcused absences rank (i.e., comparative noncognitive skills). Consider two classrooms in school A, classroom 1 and classroom 2. Each vertical line represents a particular student's grade 9 unexcused absences (i.e., noncognitive skills) position in the classroom performance distribution. Both classrooms have the same number of students and the same average noncognitive skills. Classroom 1 has a higher dispersion of noncognitive skills than classroom 2. Two students with the same own noncognitive skills and the same average classroom characteristics (including average noncognitive skills) could have different comparative noncognitive skills (proxied by the within-classroom rank position of unexcused absences) because of different dispersions of peers' grade 9 unexcused absences in different classrooms due to quasi-random peer group formation.

Figure 2: Male-Female Ratios across the Performance Distribution



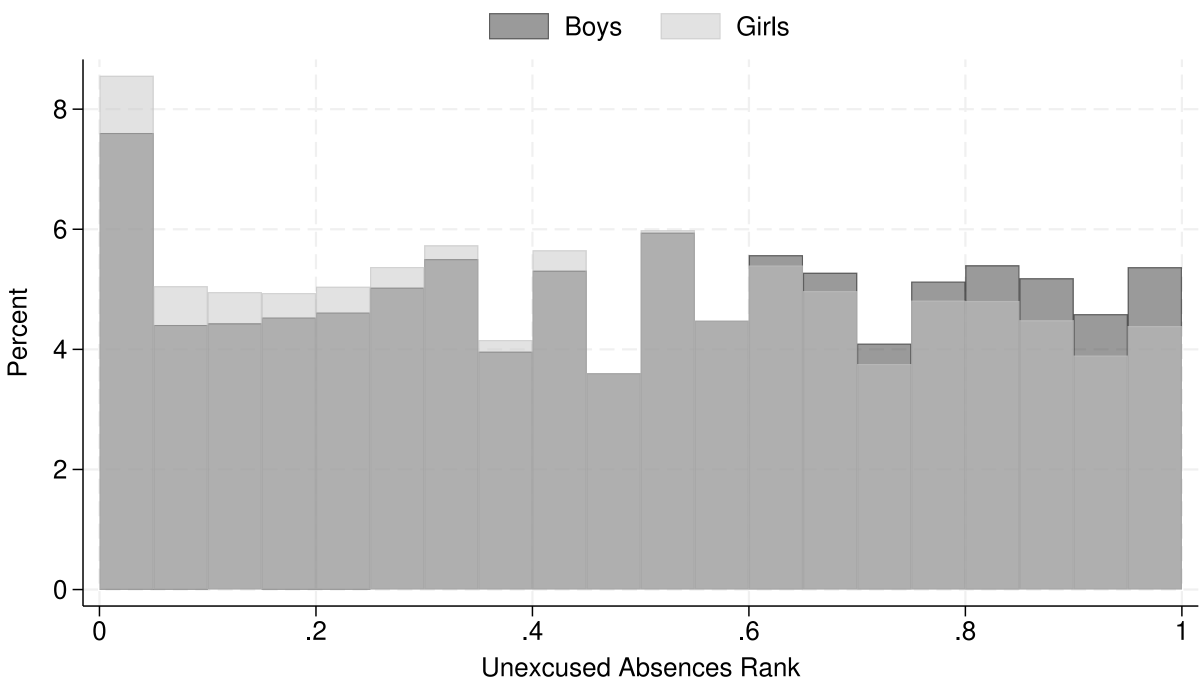
Notes: This graph displays the male-to-female ratio in different percentiles of performance in Mathematics and Greek Language. Final exam scores are used to measure student performance.

Figure 3: Variation in Unexcused Absences Rank with Unexcused Absences



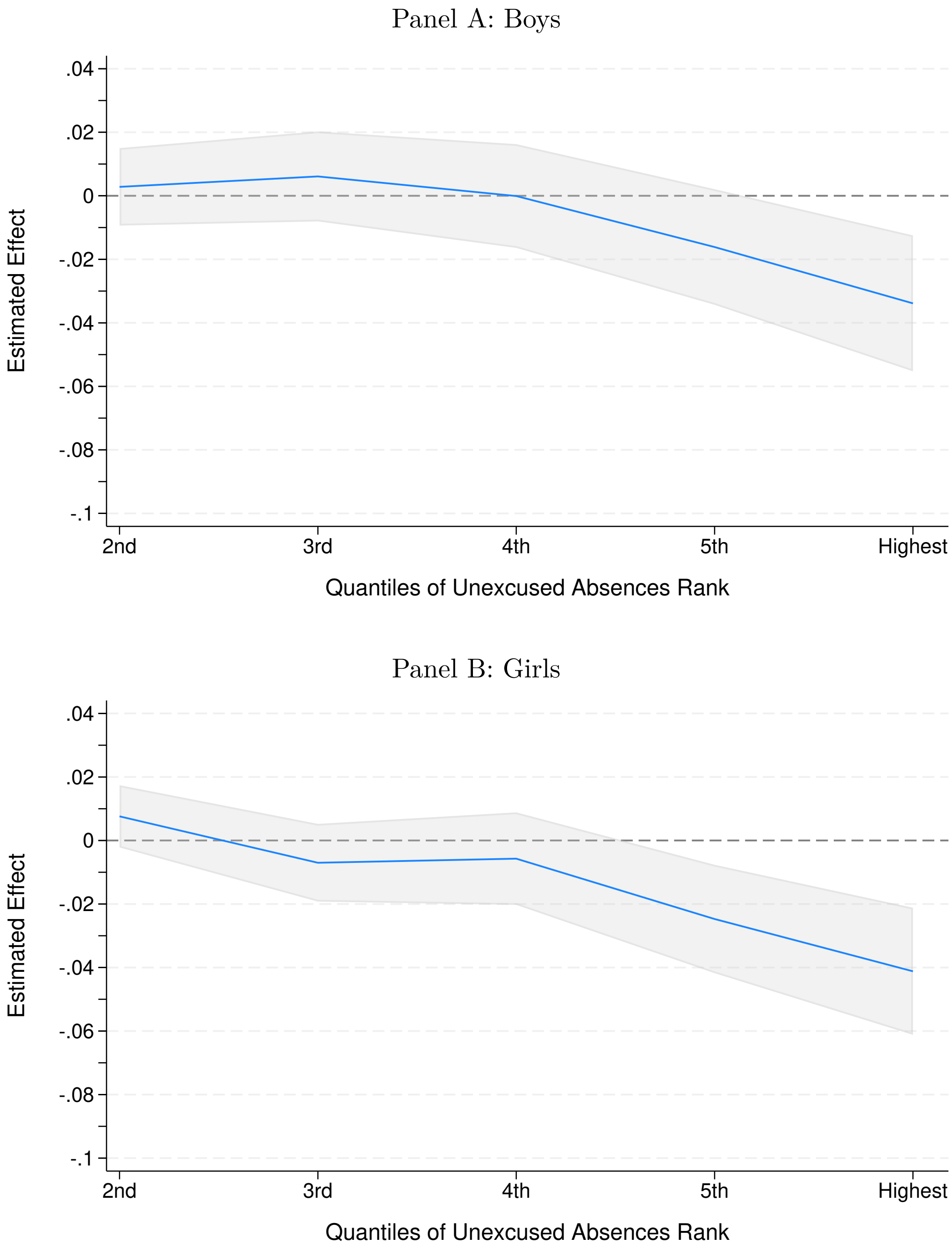
Notes: This graph shows the relationship between students' unexcused absences in grade 9 and their rank in grade 9 unexcused absences within the grade 10 classroom. For each decile of unexcused absences, the box plot shows the 25th percentile, median, 75th percentile, minimum, and maximum of the rank distribution. The mean value for each decile is also reported as labels on the horizontal axis.

Figure 4: Differential Unexcused Absences Rank for Boys and Girls



Notes: This figure shows the percentage of females and males in each percentile rank in grade 9 unexcused absences. Females are somewhat more likely than males to have a higher percentile rank in grade 9 unexcused absences.

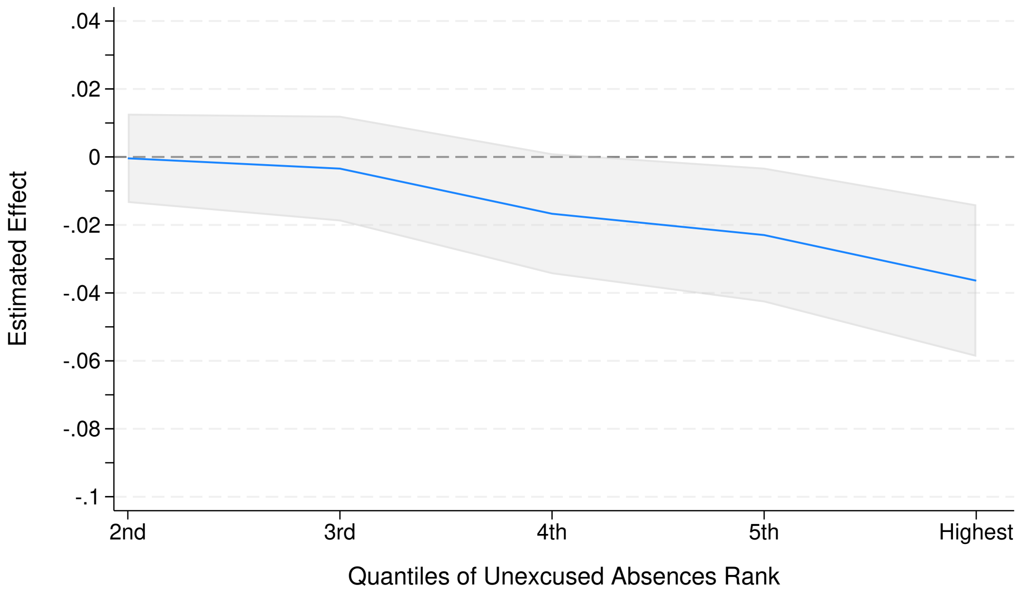
Figure 5: Nonlinear Effect of Comparative Noncognitive Skills on Non-STEM Performance



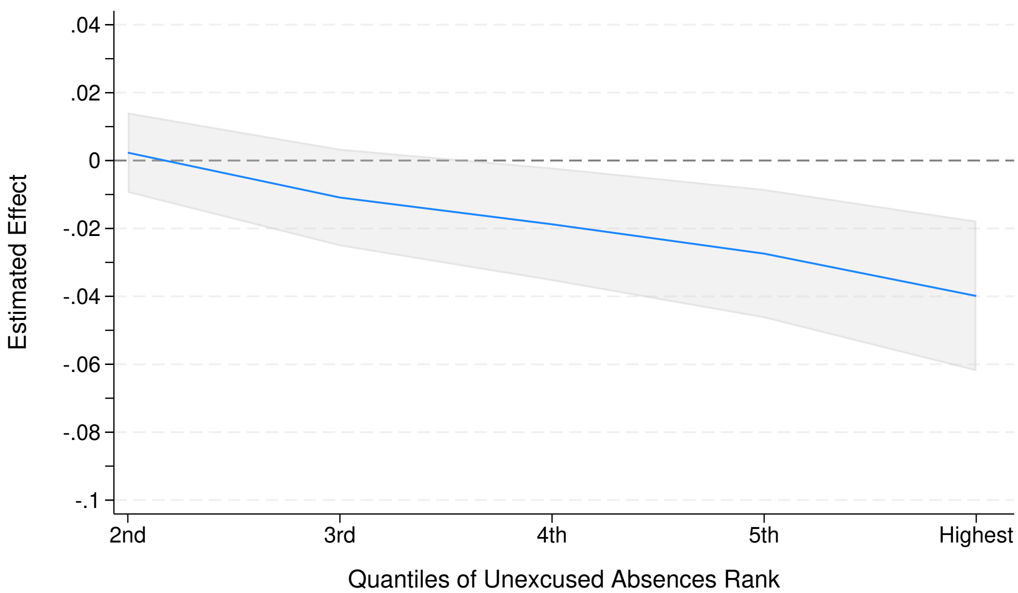
Notes: This figure plots the nonlinear effect of students' comparative noncognitive skills, measured as their rank in unexcused absences within the classroom, on subsequent non-STEM performance in grade 10. Effects are estimated for boys (Panel A) and girls (Panel B). I estimate the nonlinear effects of comparative noncognitive skills by replacing the linear unexcused absences rank measure with indicators for quantiles of within-classroom unexcused absences rank and interacting these indicators with gender in a classroom fixed-effects specification. I then estimate the discrete effect of each quantile relative to the omitted (lowest) quantile separately for boys and girls. The specification controls for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. The solid line represents point estimates across quantiles of the unexcused absences rank, while the shaded area indicates 95% confidence intervals. The zero line represents the baseline of the 1st quantile.

Figure 6: Nonlinear Effect of Comparative Noncognitive Skills on STEM Performance

Panel A: Boys



Panel B: Girls



Notes: This figure plots the nonlinear effect of students' comparative noncognitive skills, measured as their rank in unexcused absences within the classroom, on subsequent STEM performance in grade 10. Effects are estimated for boys (Panel A) and girls (Panel B). I estimate the nonlinear effects of comparative noncognitive skills by replacing the linear unexcused absences rank measure with indicators for quantiles of within-classroom unexcused absences rank and interacting these indicators with gender in a classroom fixed-effects specification. I then estimate the discrete effect of each quantile relative to the omitted (lowest) quantile separately for boys and girls. The specification controls for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. The solid line represents point estimates across quantiles of the unexcused absences rank, while the shaded area indicates 95% confidence intervals. The zero line represents the baseline of the 1^{st} quantile.

Table 1: Descriptive Statistics

	All		Boys	Girls	
	Mean	(Std. Dev.)	Mean	Mean	P-value
	(1)	(2)	(3)	(4)	(5)
Absences					
Total Absences, Grade 9	65.407	(35.944)	67.159	63.811	0.000
Total Absences, Grade 10	70.078	(35.023)	72.519	67.854	0.000
Total Absences, Grade 11	77.742	(34.839)	79.068	76.606	0.000
Total Absences, Grade 12	89.022	(40.541)	89.141	88.922	0.267
Unexcused Absences, Grade 9	50.600	(28.637)	51.894	49.422	0.000
Unexcused Absences, Grade 10	57.646	(29.042)	59.565	55.898	0.000
Unexcused Absences, Grade 11	62.839	(29.994)	64.235	61.642	0.000
Unexcused Absences, Grade 12	51.745	(25.748)	53.166	50.543	0.000
Comparative Noncognitive Traits					
Unexcused Absences Rank	0.479	(0.296)	0.494	0.466	0.000
Same-gender Unexcused Absences Rank	0.479	(0.311)	0.479	0.480	0.526
School Cohort Unexcused Absences Rank	2.438	(2.288)	2.491	2.390	0.000
Performance					
Greek Language, Grade 9	0.223	(0.902)	0.034	0.396	0.000
Greek Language, Grade 10	0.002	(0.988)	-0.244	0.225	0.000
Greek Language, Grade 11	0.008	(0.984)	-0.230	0.213	0.000
Greek Language, Grade 12	0.002	(0.997)	-0.040	0.071	0.000
Mathematics, Grade 9	0.175	(0.993)	0.105	0.239	0.000
Mathematics, Grade 10	0.079	(1.011)	0.023	0.130	0.000
Mathematics, Grade 11	0.066	(1.023)	0.086	0.052	0.000
Mathematics, Grade 12	0.002	(0.997)	-0.040	0.071	0.000
Track Choice (1=Yes)					
Competitive STEM Track	0.333	(0.471)	0.338	0.329	0.000
Non-competitive STEM Track	0.267	(0.443)	0.361	0.188	0.000
Non-STEM Track	0.290	(0.454)	0.152	0.407	0.000
Vocational School Transfer	0.079	(0.269)	0.104	0.056	0.000
National Exams					
Participation (1=Yes)	0.965	(0.184)	0.956	0.972	0.000
Performance	-0.208	(0.798)	-0.239	-0.182	0.000
University Admission (1=Yes)	0.742	(0.438)	0.715	0.765	0.000
High-earning Program Admission (1=Yes)	0.207	(0.405)	0.228	0.190	0.000
University Applications	22.473	(23.368)	22.054	22.807	0.000
Applications to STEM Programs	5.814	(9.508)	7.764	4.257	0.000
Applications to High-earning Programs	4.268	(6.271)	5.137	3.573	0.000
Expected Salary					
Log Expected Salary	7.123	(0.210)	7.152	7.101	0.000
Expected Salary in Top 25% (1=Yes)	0.282	(0.450)	0.323	0.250	0.000

Notes: This table presents descriptive statistics for the main variables used in the analysis. Columns (1) and (2) report the mean and standard deviation for the full sample, respectively. Columns (3) and (4) report mean values separately for boys and girls. Column (5) reports p-values from tests of equality of means between boys and girls.

Table 2: Balance Tests: Unexcused Absences Rank by Grade 10 Classroom Characteristics

	Independent Variable
Dependent Variable	Unexcused Absences Rank
Mean GPA, Grade 9	-0.00043
	(0.00118)
Mean GPA of Boys, Grade 9	-0.00005
	(0.00077)
Mean GPA of Girls, Grade 9	-0.00038
	(0.00083)
Mean Performance for Boys, Mathematics, Grade 9	-0.00026
	(0.00097)
Mean Performance for Girls, Mathematics, Grade 9	-0.00054
	(0.00105)
Mean Performance for Boys, Greek Language, Grade 9	0.00053
	(0.00098)
Mean Performance for Girls, Greek Language, Grade 9	0.00017
	(0.00100)
Mean Total Absences, Grade 9	0.06563
	(0.05499)
Mean Total Absences of Boys, Grade 9	0.04660
	(0.05868)
Mean Total Absences of Girls, Grade 9	0.01904
	(0.05840)
Mean Unexcused Absences, Grade 9	0.03755
	(0.04036)
Mean Unexcused Absences of Boys, Grade 9	0.03395
	(0.04517)
Mean Unexcused Absences of Girls, Grade 9	0.00360
	(0.04478)
Proportion of Girls	0.00011
	(0.00070)

Notes: This table reports balance checks of the ordinal rank of unexcused absences with respect to grade 10 classroom characteristics. Each row corresponds to a regression where the listed classroom characteristic from grade 9 is the dependent variable and the student's ordinal rank in the grade 10 classroom (based on grade 9 unexcused absences) is the independent variable. All regressions include school and year fixed effects. Standard errors are reported in parentheses. Observations: 342,913.

Table 3: Effect of Comparative Noncognitive Skills on Grade 10 Performance

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	Greek Language, Grade 10					
Unexcused Abs. Rank × Boy [1]	-0.017	-0.046***	-0.035**	-0.032**	-0.034**	-0.062***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)
Unexcused Abs. Rank × Girl [2]	-0.025*	-0.053***	-0.044***	-0.042***	-0.043***	-0.066***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.012)
Observations	342,913	342,913	342,913	342,913	342,913	342,913
Y Mean	0.002	0.002	0.002	0.002	0.002	0.002
Y SD	0.988	0.988	0.988	0.988	0.988	0.988
Gender Gap Y	0.469	0.469	0.469	0.469	0.469	0.469
P-value H0: [1]=[2]	0.556	0.605	0.514	0.489	0.503	0.754
	Mathematics, Grade 10					
Unexcused Abs. Rank × Boy [1]	-0.028**	-0.036**	-0.032**	-0.030**	-0.031**	-0.060***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)
Unexcused Abs. Rank × Girl [2]	-0.033**	-0.041***	-0.035**	-0.033**	-0.033**	-0.064***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)
Observations	342,300	342,300	342,300	342,300	342,300	342,300
Y Mean	0.079	0.079	0.079	0.079	0.079	0.079
Y SD	1.011	1.011	1.011	1.011	1.011	1.011
Gender Gap Y	0.106	0.106	0.106	0.106	0.106	0.106
P-value H0: [1]=[2]	0.724	0.761	0.843	0.829	0.884	0.764
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on student performance. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 4: Effect of Comparative Noncognitive Skills on Grade 11 Performance

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	Greek Language, Grade 11					
Unexcused Abs. Rank × Boy [1]	-0.032	-0.071***	-0.059***	-0.055***	-0.057***	-0.081***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)
Unexcused Abs. Rank × Girl [2]	-0.029*	-0.066***	-0.053***	-0.050***	-0.054***	-0.075***
	(0.017)	(0.017)	(0.018)	(0.017)	(0.018)	(0.016)
Observations	186,735	186,735	186,735	186,735	186,735	186,735
Y Mean	0.008	0.008	0.008	0.008	0.008	0.008
Y SD	0.984	0.984	0.984	0.984	0.984	0.984
Gender Gap Y	0.443	0.443	0.443	0.443	0.443	0.443
P-value H0: [1]=[2]	0.900	0.780	0.782	0.807	0.871	0.763
	Mathematics, Grade 11					
Unexcused Abs. Rank × Boy [1]	-0.082***	-0.075***	-0.077***	-0.077***	-0.079***	-0.120***
	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.026)
Unexcused Abs. Rank × Girl [2]	-0.083***	-0.070***	-0.068***	-0.068***	-0.070***	-0.113***
	(0.023)	(0.024)	(0.024)	(0.024)	(0.024)	(0.022)
Observations	144,206	144,206	144,206	144,206	144,206	144,206
Y Mean	0.066	0.066	0.066	0.066	0.066	0.066
Y SD	1.023	1.023	1.023	1.023	1.023	1.023
Gender Gap Y	-0.034	-0.034	-0.034	-0.034	-0.034	-0.034
P-value H0: [1]=[2]	0.966	0.859	0.731	0.729	0.723	0.762
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on student performance. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 5: Effect of Comparative Noncognitive Skills on STEM Track Choice

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	Competitive STEM Track Choice (1=Yes)					
Unexcused Abs. Rank × Boy [1]	0.015	0.035**	0.035**	0.033**	0.031**	0.021
	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)
Unexcused Abs. Rank × Girl [2]	-0.055***	-0.034**	-0.034**	-0.035**	-0.037***	-0.047***
	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)
Observations	174,756	174,756	174,756	174,756	174,756	174,756
Y Mean	0.333	0.333	0.333	0.333	0.333	0.333
Y SD	0.471	0.471	0.471	0.471	0.471	0.471
Gender Gap Y	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
	Noncompetitive STEM Track Choice (1=Yes)					
Unexcused Abs. Rank × Boy [1]	-0.279***	-0.292***	-0.290***	-0.287***	-0.285***	-0.247***
	(0.011)	(0.012)	(0.012)	(0.012)	(0.012)	(0.011)
Unexcused Abs. Rank × Girl [2]	0.093***	0.094***	0.093***	0.096***	0.097***	0.114***
	(0.010)	(0.011)	(0.011)	(0.011)	(0.011)	(0.010)
Observations	174,756	174,756	174,756	174,756	174,756	174,756
Y Mean	0.266	0.266	0.266	0.266	0.266	0.266
Y SD	0.442	0.442	0.442	0.442	0.442	0.442
Gender Gap Y	-0.172	-0.172	-0.172	-0.172	-0.172	-0.172
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on enrollment in a competitive STEM track and non-competitive STEM track in grade 12. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 6: Effect of Comparative Noncognitive Skills on Vocational School Transfer

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	Vocational School Transfer at Grade 11 (1=Yes)					
Unexcused Abs. Rank × Boy [1]	0.008	0.015*	0.014*	0.014*	0.014*	0.022***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.007)
Unexcused Abs. Rank × Girl [2]	0.014**	0.021***	0.019***	0.019***	0.019***	0.027***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.006)
Observations	206,219	206,219	206,219	206,219	206,219	206,219
Y Mean	0.079	0.079	0.079	0.079	0.079	0.079
Y SD	0.269	0.269	0.269	0.269	0.269	0.269
Gender Gap Y	-0.049	-0.049	-0.049	-0.049	-0.049	-0.049
P-value H0: [1]=[2]	0.401	0.398	0.511	0.501	0.521	0.501
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on vocational school transfer at grade 11. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 7: Effect of Comparative Noncognitive Skills on the Number of Applications to High-earning Programs

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	Number of Applications to High-earning Programs					
Unexcused Abs. Rank × Boy [1]	2.573***	2.209***	2.209***	2.129***	2.136***	1.998***
	(0.239)	(0.245)	(0.245)	(0.245)	(0.245)	(0.234)
Unexcused Abs. Rank × Girl [2]	0.316*	-0.062	-0.062	-0.110	-0.088	-0.046
	(0.173)	(0.186)	(0.186)	(0.186)	(0.186)	(0.170)
Observations	134,083	134,083	134,083	134,083	134,083	134,083
Y Mean	4.323	4.323	4.323	4.323	4.323	4.323
Y SD	6.366	6.366	6.366	6.366	6.366	6.366
Gender Gap Y	-1.636	-1.636	-1.636	-1.636	-1.636	-1.636
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on the number of applications to higher-earning degree programs (i.e., degree programs with expected earnings in the top quartile). Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 8: Effect of Comparative Noncognitive Skills on High-earning Program Admission

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	High-earning Program Admission (1=Yes)					
Unexcused Abs. Rank × Boy [1]	0.064***	0.051***	0.051***	0.050***	0.051***	0.051***
	(0.016)	(0.017)	(0.017)	(0.017)	(0.018)	(0.016)
Unexcused Abs. Rank × Girl [2]	0.010	-0.000	-0.000	-0.003	-0.003	0.000
	(0.015)	(0.016)	(0.016)	(0.016)	(0.016)	(0.015)
Observations	125,079	125,079	125,079	125,079	125,079	125,079
Y Mean	0.282	0.282	0.282	0.282	0.282	0.282
Y SD	0.450	0.450	0.450	0.450	0.450	0.450
Gender Gap Y	-0.073	-0.073	-0.073	-0.073	-0.073	-0.073
P-value H0: [1]=[2]	0.001	0.002	0.002	0.001	0.001	0.001
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on the likelihood of high-earning program admission (i.e., degree programs with expected earnings in the top quartile) among admitted students. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 9: Effect of Comparative Cognitive and Noncognitive Skills on Student Performance

	Linear (1)	Quadratic (2)	Cubic (3)	Quartic (4)	Quintic (5)	Nonlinear (6)
	Greek Language, Grade 10					
Unexcused Abs. Rank × Boy [1]	-0.014	-0.048***	-0.036**	-0.032**	-0.034**	-0.059***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)
Unexcused Abs. Rank × Girl [2]	-0.024*	-0.055***	-0.046***	-0.044***	-0.045***	-0.065***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.012)
Prior Performance Rank × Boy [3]	0.346***	0.144***	0.143***	0.160***	0.159***	0.203***
	(0.016)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Prior Performance Rank × Girl [4]	0.308***	0.186***	0.180***	0.196***	0.195***	0.230***
	(0.015)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Observations	342,913	342,913	342,913	342,913	342,913	342,913
Y Mean	0.002	0.002	0.002	0.002	0.002	0.002
Y SD	0.988	0.988	0.988	0.988	0.988	0.988
Gender Gap Y	0.469	0.469	0.469	0.469	0.469	0.469
P-value H0: [1]=[2]	0.473	0.588	0.431	0.388	0.405	0.668
P-value H0: [3]=[4]	0.011	0.009	0.024	0.023	0.028	0.089
	Mathematics, Grade 10					
Unexcused Abs. Rank × Boy [1]	-0.028**	-0.052***	-0.047***	-0.047***	-0.048***	-0.082***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)
Unexcused Abs. Rank × Girl [2]	-0.028**	-0.049***	-0.042***	-0.042***	-0.042***	-0.077***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)
Prior Performance Rank × Boy [3]	0.411***	0.182***	0.159***	0.142***	0.144***	0.168***
	(0.020)	(0.018)	(0.018)	(0.019)	(0.019)	(0.018)
Prior Performance Rank × Girl [4]	0.535***	0.299***	0.275***	0.254***	0.255***	0.282***
	(0.019)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Observations	342,300	342,300	342,300	342,300	342,300	342,300
Y Mean	0.079	0.079	0.079	0.079	0.079	0.079
Y SD	1.011	1.011	1.011	1.011	1.011	1.011
Gender Gap Y	0.106	0.106	0.106	0.106	0.106	0.106
P-value H0: [1]=[2]	0.975	0.828	0.694	0.703	0.669	0.679
P-value H0: [3]=[4]	0.000	0.000	0.000	0.000	0.000	0.000
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

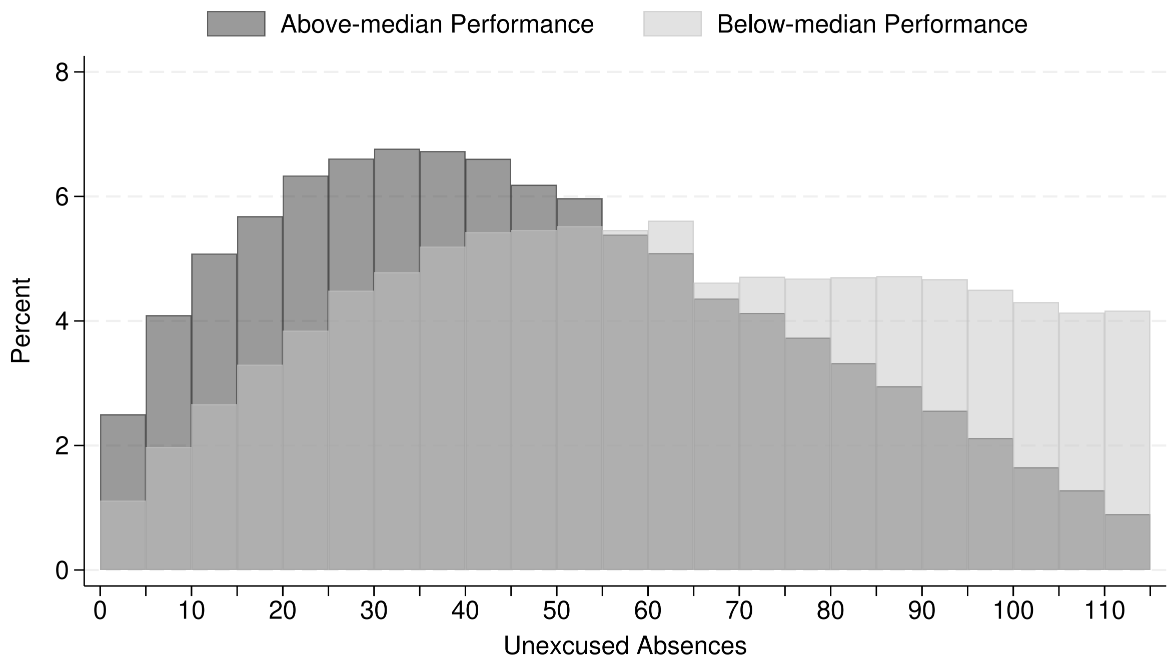
Notes: This table reports the estimated effects of comparative cognitive and noncognitive skills on student performance. Comparative cognitive skills are measured using each student's classroom rank in grade 9 performance in the respective subject. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Supplementary Appendix

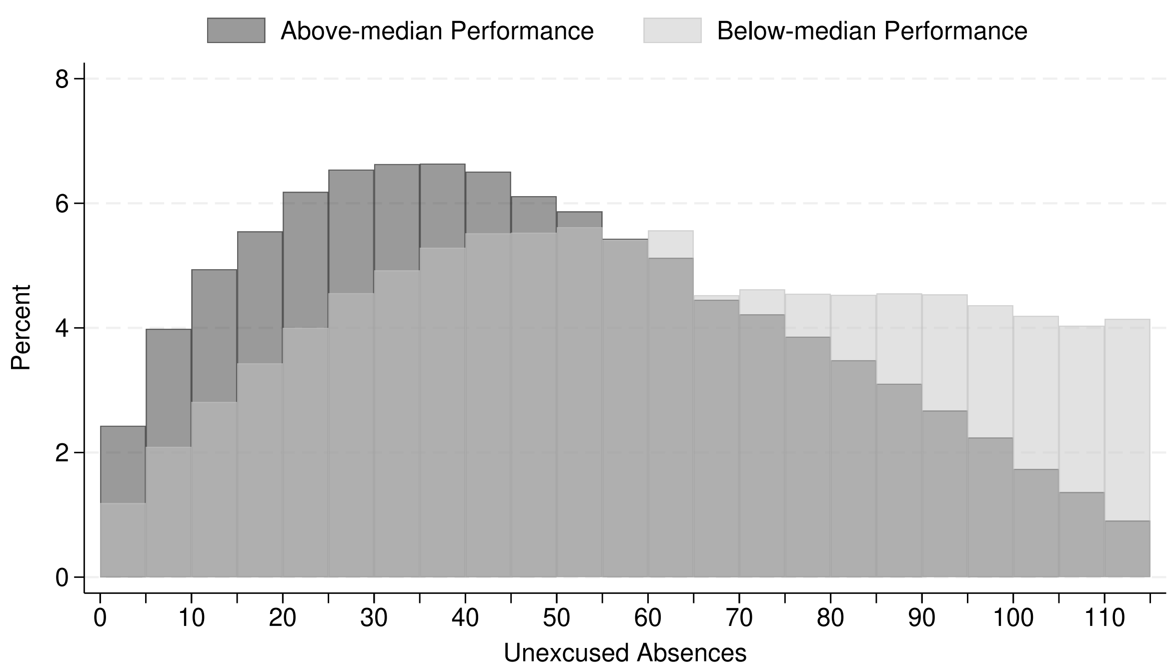
S1 Supplementary Figures

Figure S1: Distribution of Unexcused Absences by Performance

Panel A: Mathematics



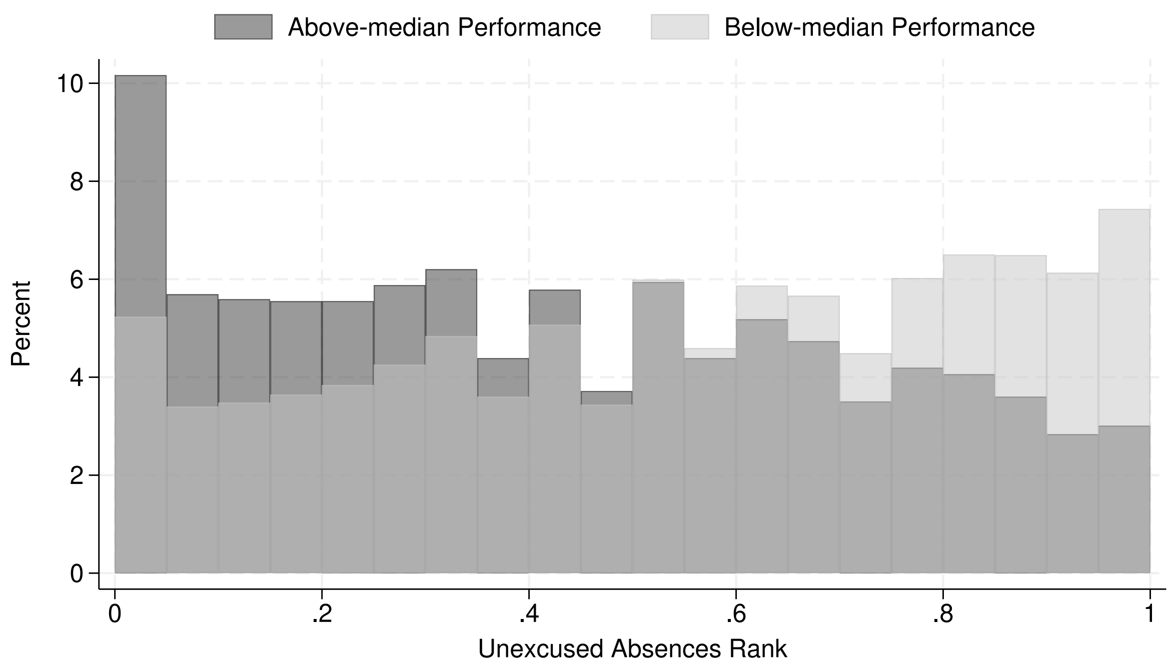
Panel B: Greek Language



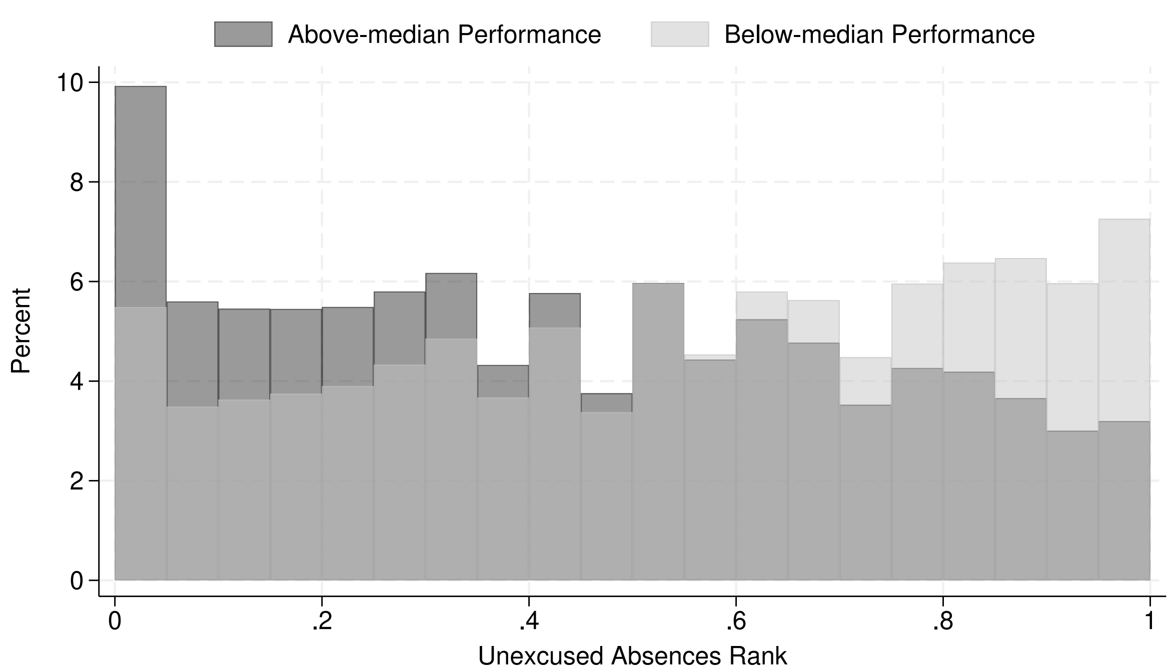
Notes: This figure plots the distribution of grade 9 unexcused absences for students with above- and below-median grade 9 performance in Mathematics (Panel A) and Greek Language (Panel B).

Figure S2: Distribution of Unexcused Absences Rank by Performance

Panel A: Mathematics

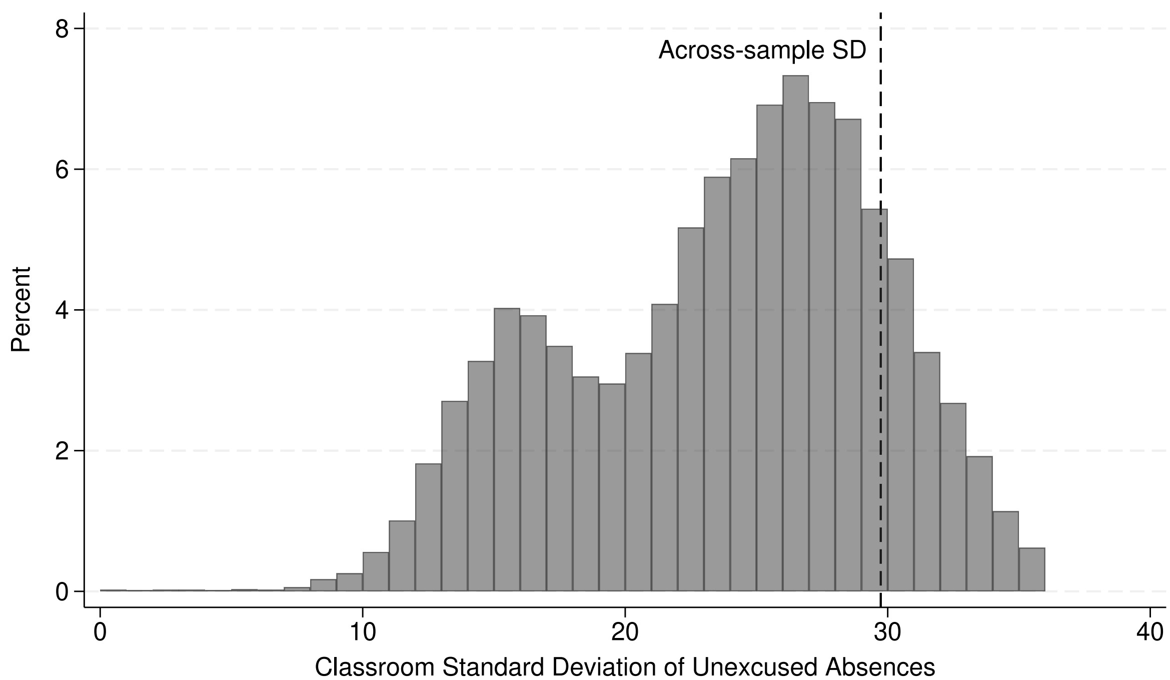


Panel B: Greek Language



Notes: This figure plots the distribution of grade 9 unexcused absences rank for students with above- and below-median grade 9 performance in Mathematics (Panel A) and Greek Language (Panel B).

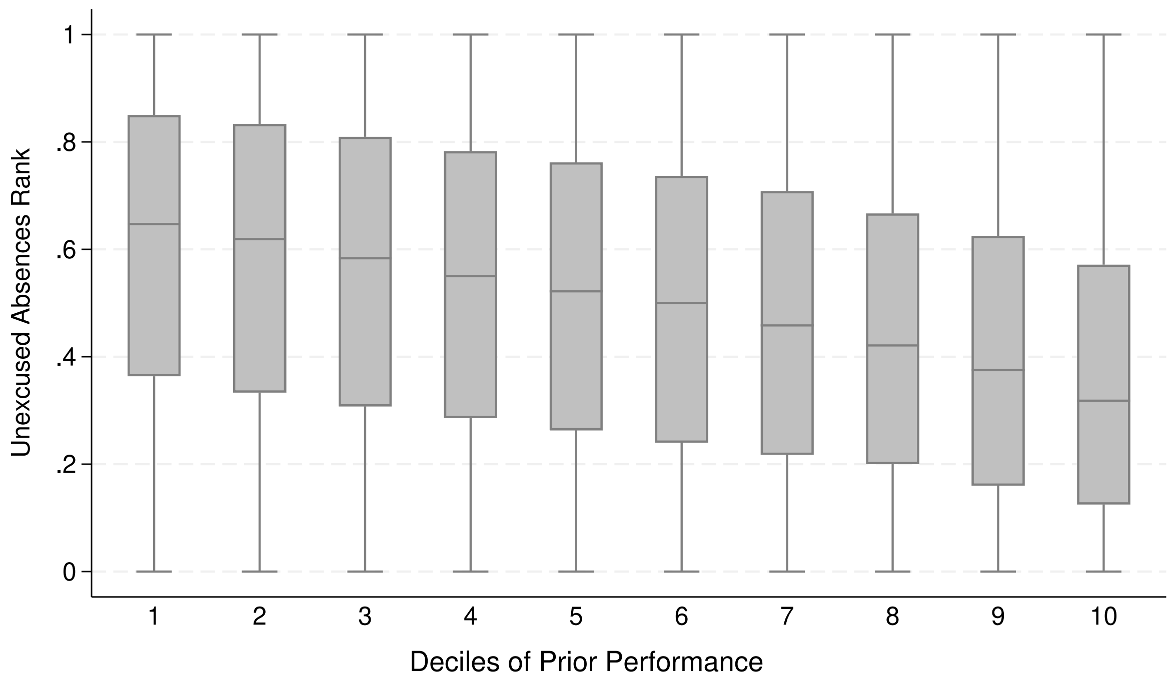
Figure S3: Distribution of Dispersion of Unexcused Absences within Classrooms



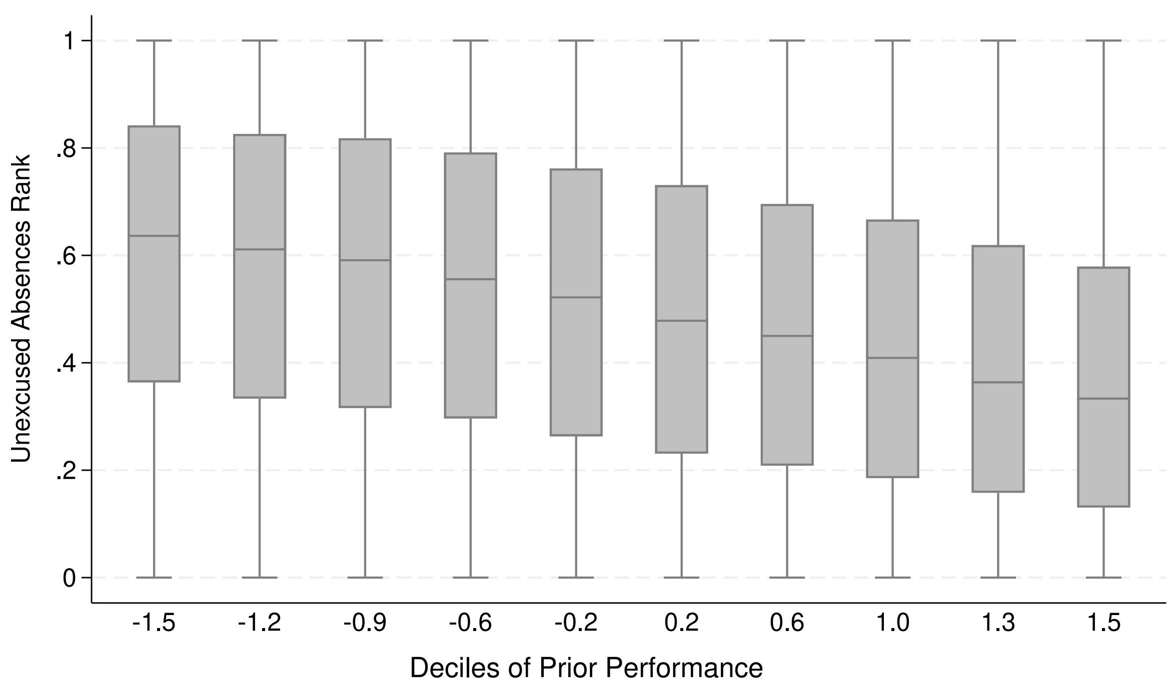
Notes: The histogram of the within-classroom standard deviation of unexcused absences reveals substantial variation in the dispersion of unexcused absences in the classroom. The dashed vertical line corresponds to the standard deviation of unexcused absences across all students.

Figure S4: Association Between Unexcused Absences Rank with Prior Performance

Panel A: Greek Language



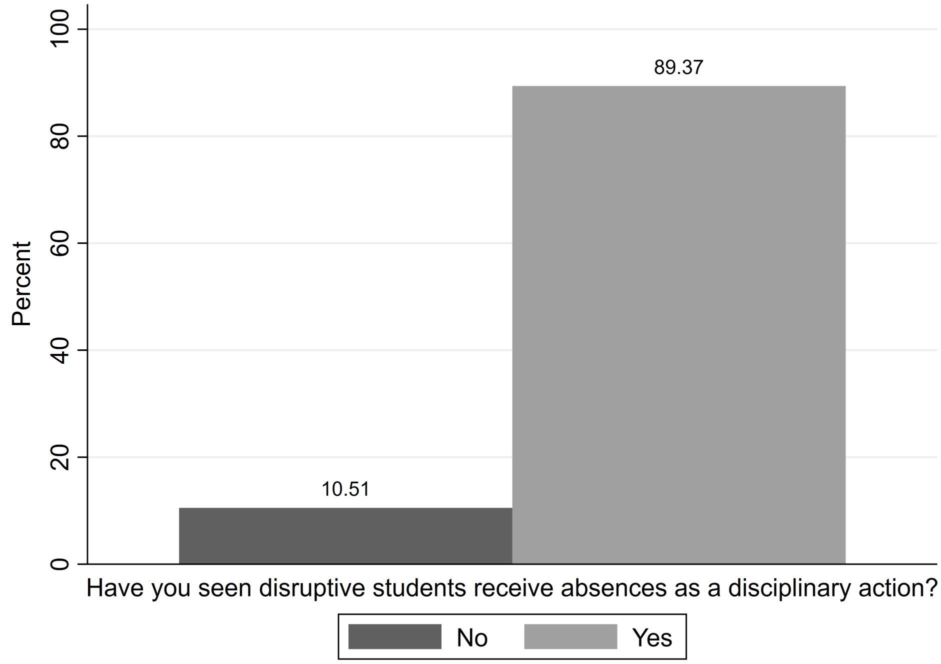
Panel B: Mathematics



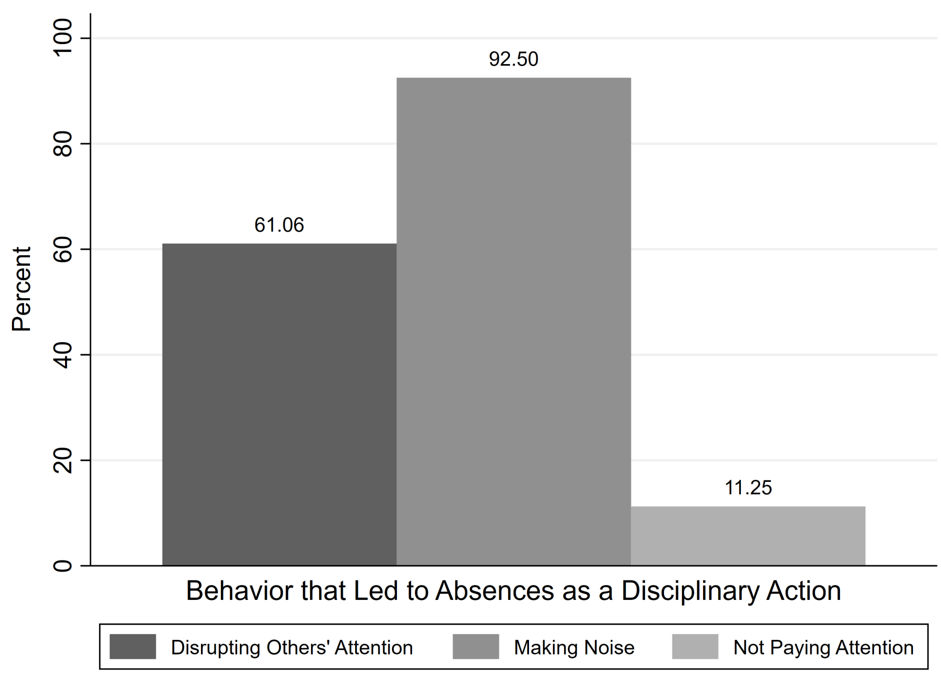
Notes: This graph shows the relationship between students' prior performance (Greek Language in Panel A and Mathematics in Panel B) in grade 9 and their rank in grade 9 unexcused absences within the grade 10 classroom. For each decile of unexcused absences, the box plot shows the 25th percentile, median, 75th percentile, minimum, and maximum of the rank distribution. The mean value for each decile is also reported as labels on the horizontal axis.

Figure S5: Unexcused Absences and Suspensions

(a) Association Between Unexcused Absences and Suspensions

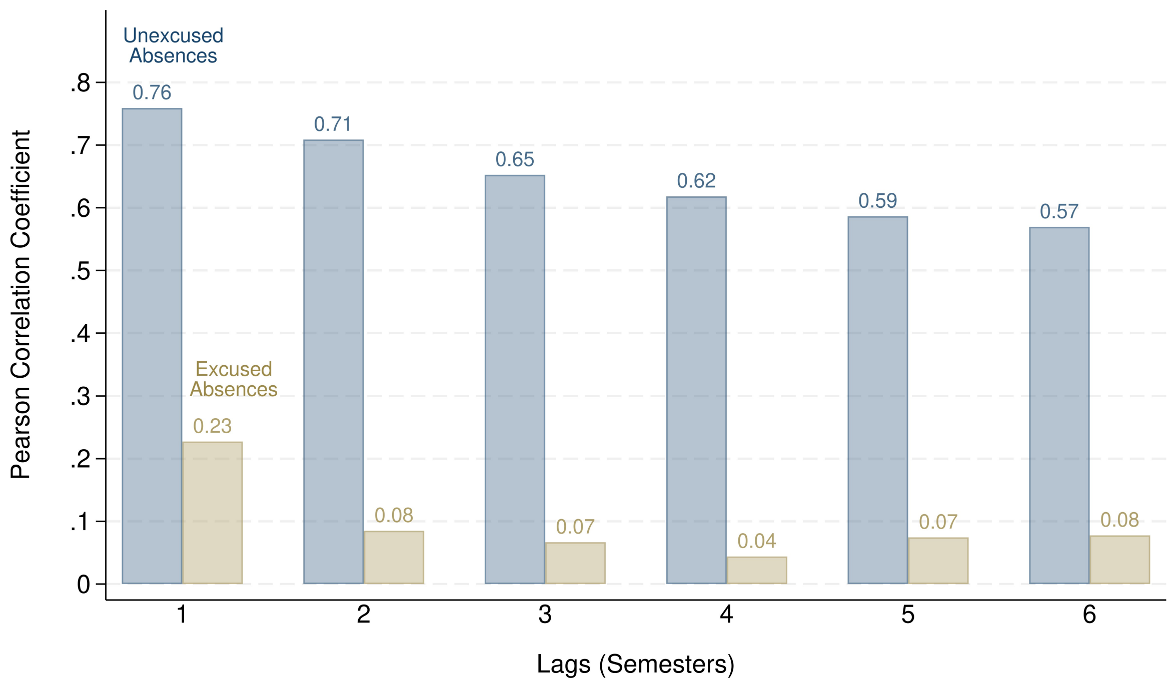


(b) Behavior that Led to Suspensions



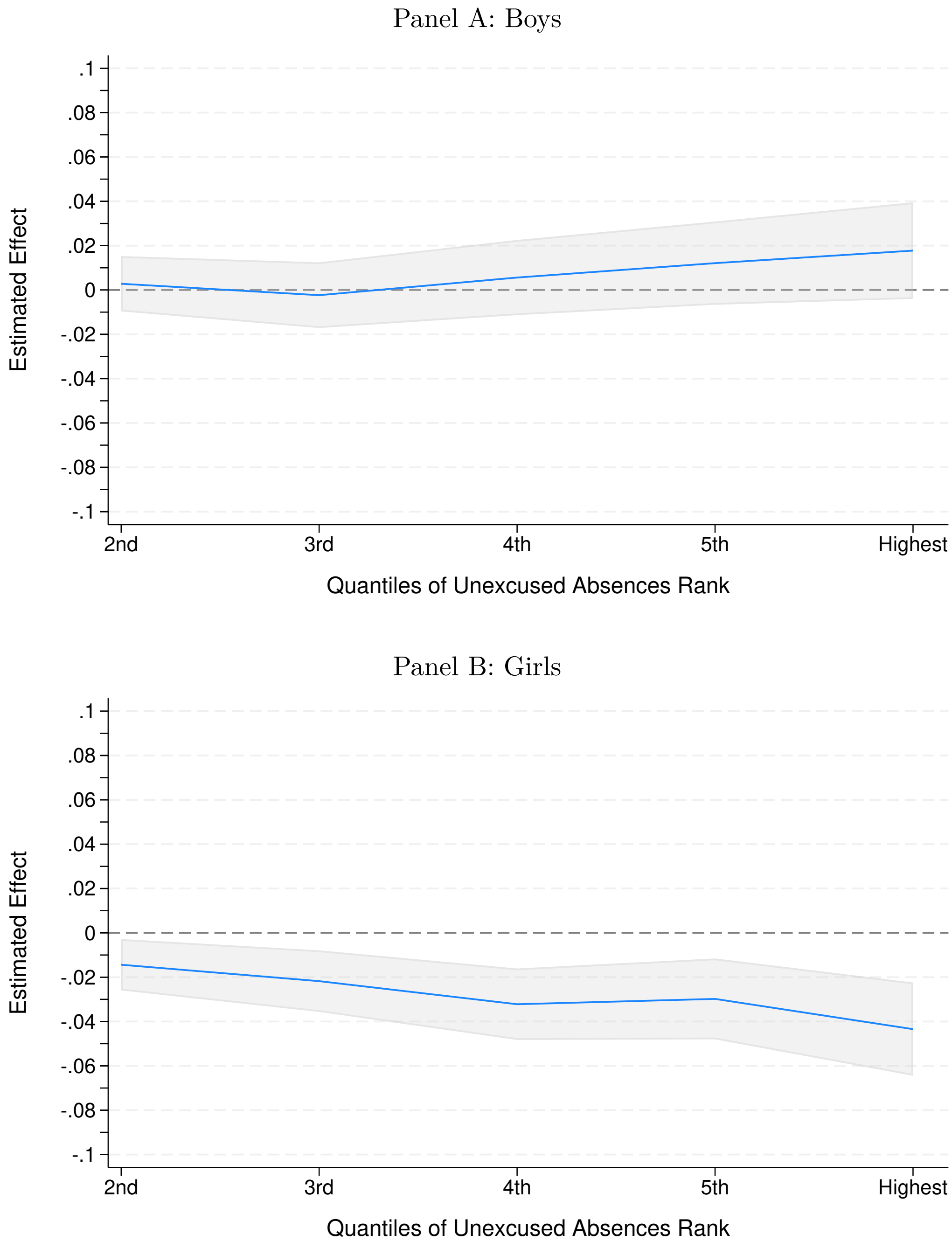
Notes: Panel A shows high school students' survey responses on whether they have witnessed students receiving hours of suspension as a penalty for disruptive behavior. The relevant question asked: "Have you witnessed the use of hourly unexcused absences as a penalty for disruptive students?" with response options "Yes" or "No." Panel B presents students' survey responses on behaviors that result in unexcused absences as a penalty. Students answered the multiple-choice question: "In what ways can a student in your classroom behave and receive unexcused absences as a penalty?" with options "Disrupting Others' Attention," "Making Noise," and "Not Paying Attention."

Figure S6: Behavioral Serial Correlation



Notes: The figure reports within-student Pearson serial correlations in excused and unexcused absences across semester lags. Unexcused absences exhibit high and persistent serial correlation across semesters, while excused absences display low persistence, consistent with unexcused absences capturing stable behavioral differences rather than transitory shocks.

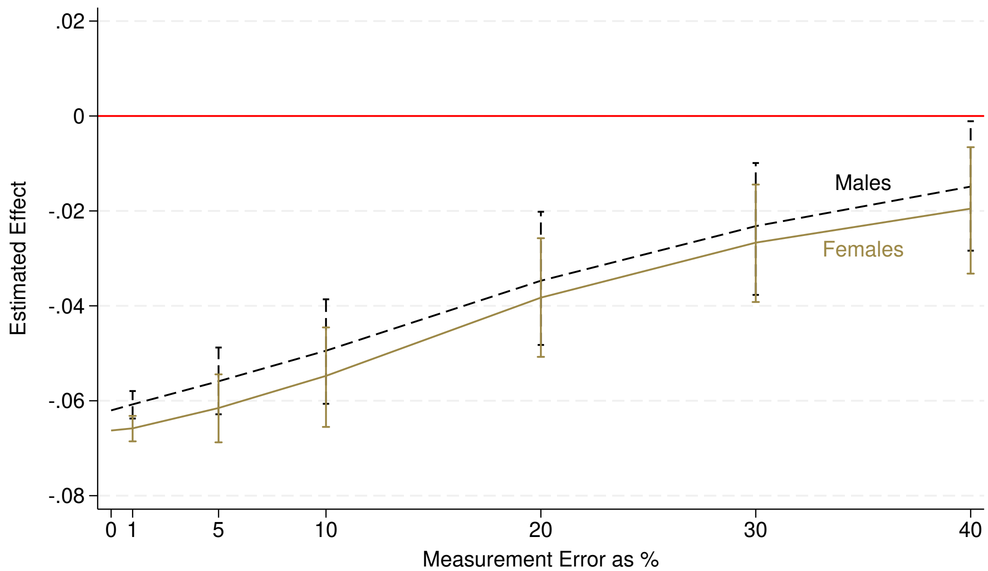
Figure S7: Nonlinear Effect of Comparative Noncognitive Skills on Competitive STEM Track Choice



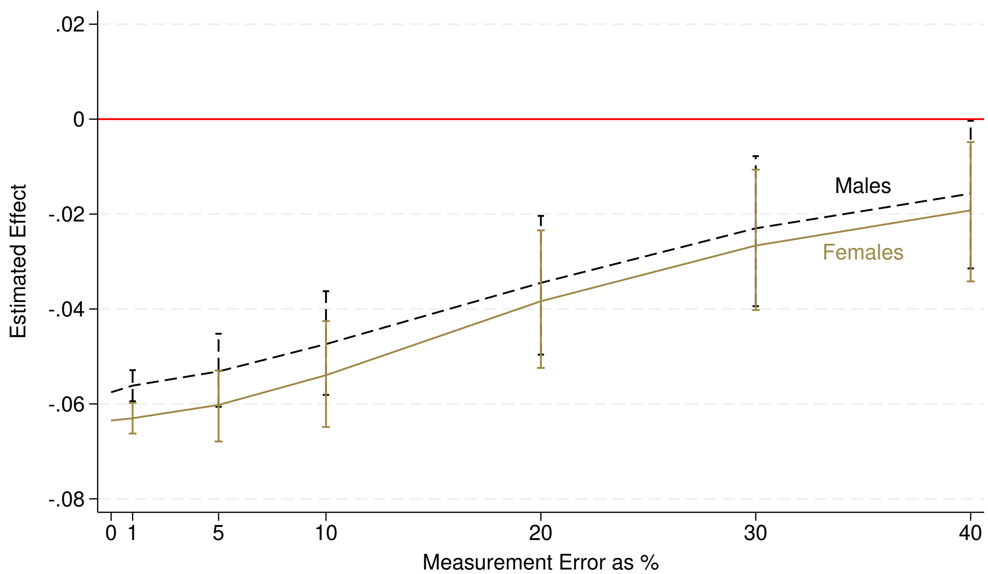
Notes: This figure plots the nonlinear effect of students' comparative noncognitive skills, measured as their rank in unexcused absences within the classroom, on competitive STEM track choice in grade 12. Effects are estimated for boys (Panel A) and girls (Panel B). The solid line represents point estimates across quantiles of the unexcused absences rank, while the shaded area indicates 95% confidence intervals. The zero line represents the baseline of the 1^{st} quantile.

Figure S8: Effect of Comparative Noncognitive Skills from Monte Carlo Simulations with Additive Random Noise

Panel A: Greek Language



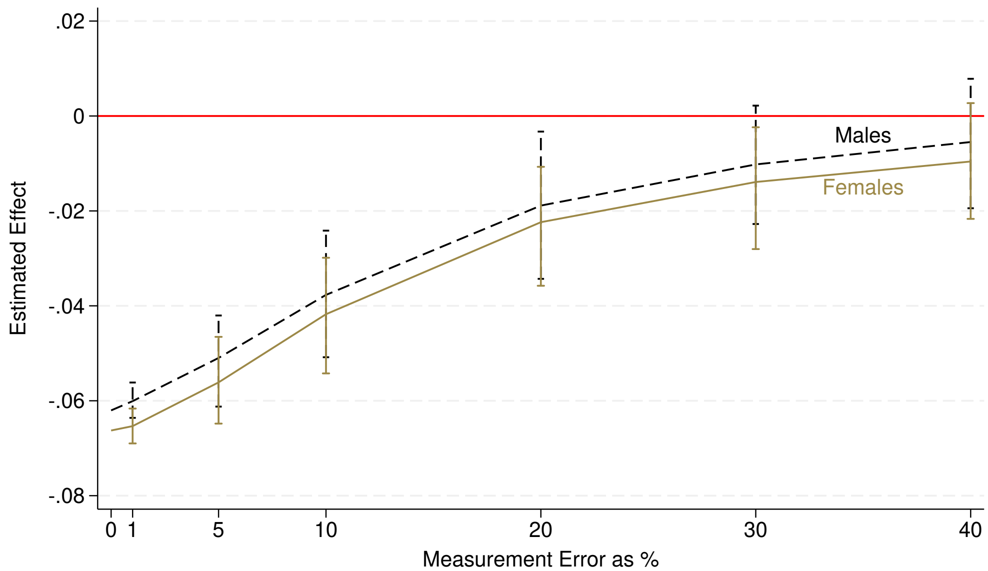
Panel B: Mathematics



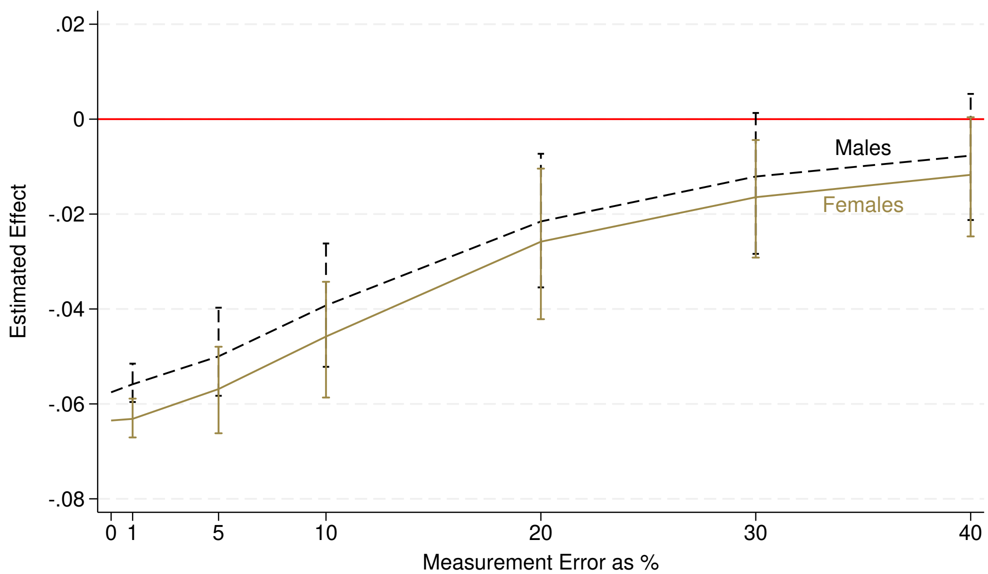
Notes: This figure reports Monte Carlo estimates of the effect of comparative noncognitive skills on grade 10 academic performance under increasing levels of additive measurement error in the underlying unexcused-absences measure. Comparative noncognitive skills are proxied by each student's within-classroom rank in grade 9 unexcused absences. To assess sensitivity to imperfect measurement, the original unexcused-absences measure is contaminated with independent mean-zero normal noise, scaled to a given percentage of its standard deviation. For each noise level, the comparative noncognitive-skills rank is recomputed and the baseline specification is re-estimated. Each point corresponds to the average coefficient across 400 Monte Carlo replications. The horizontal axis reports the magnitude of measurement error as a percentage of the standard deviation of unexcused absences; the vertical axis reports the estimated effect. Panel A shows results for Greek Language and Panel B for Mathematics. Separate lines are reported for male and female students.

Figure S9: Effect of Comparative Noncognitive Skills from Monte Carlo Simulations with Multiplicative Random Noise

Panel A: Greek Language



Panel B: Mathematics



Notes: This figure reports Monte Carlo estimates of the effect of comparative noncognitive skills on grade 10 academic performance under increasing levels of multiplicative measurement error in the underlying unexcused-absences measure. Comparative noncognitive skills are proxied by each student's within-classroom rank in grade 9 unexcused absences. To assess sensitivity to imperfect measurement, the original unexcused-absences measure is contaminated with independent mean-zero normal noise, scaled to a given percentage of its standard deviation. For each noise level, the comparative noncognitive-skills rank is recomputed and the baseline specification is re-estimated. Each point corresponds to the average coefficient across 400 Monte Carlo replications. The horizontal axis reports the magnitude of measurement error as a percentage of the standard deviation of unexcused absences; the vertical axis reports the estimated effect. Panel A shows results for Greek Language and Panel B for Mathematics. Separate lines are reported for male and female students.

S2 Supplementary Tables

Table S1: Balance Tests: Unexcused Absences Rank by Grade 10 Teacher Characteristics

	Independent Variable
Dependent Variable	Unexcused Absences Rank
Female Teacher (1=Yes), Mathematics	-0.00107
	(0.00241)
Female Teacher (1=Yes), Modern Greek	-0.00008
	(0.00186)
Senior Teacher (1=Yes), Mathematics	0.00067
	(0.00246)
Senior Teacher (1=Yes), Modern Greek	-0.00014
	(0.00179)

Notes: This table reports balance checks of the ordinal rank of unexcused absences with respect to grade 10 teacher characteristics. Each row corresponds to a regression where the listed teacher characteristic is the dependent variable and the student's ordinal rank in the grade 10 classroom (based on grade 9 unexcused absences) is the independent variable. All regressions include school and year fixed effects. Standard errors are reported in parentheses. Observations: 342,913.

Table S2: Balance of Prior Classroom Characteristics Under Random Classroom Assignment

	Mean			**Standard Deviation**		
	Real	Simulated	$H_0 : E[\mu_r] = E[\mu_s]$	Real	Simulated	$H_0 : E[\sigma_r] = E[\sigma_s]$
Grade 10 Class Characteristic	$E[\mu_r]$	[p25–p75]	P-value	$E[\sigma_r]$	[p25–p75]	P-value
GPA, Grade 9	0.160	[-0.028, 0.356]	0.314	0.730	[0.650, 0.825]	0.755
Mathematics Score, Grade 9	0.135	[-0.108, 0.394]	0.485	0.934	[0.852, 1.045]	0.513
Greek Language Score, Grade 9	0.177	[-0.063, 0.444]	0.247	0.840	[0.709, 0.978]	0.594
Total Absences, Grade 9	65.607	[52.885, 76.318]	0.892	31.294	[26.167, 35.403]	0.397
Unexcused Absences, Grade 9	50.805	[37.636, 62.810]	0.737	23.592	[18.942, 28.354]	0.918

Notes: This table compares the observed distribution of grade 9 student characteristics across grade 10 classrooms with the distribution obtained under random reassignment of students within school-by-cohort cells. For each cohort, students are randomly permuted and reassigned to classrooms while preserving the observed classroom size distribution. This procedure is repeated 500 times. For each simulated assignment, classroom-level means and standard deviations are computed and then averaged at school-cohort level. The table reports the interquartile range of these simulated statistics at the school cohort level. The "Real" column reports the corresponding values in the observed data. P-values are obtained from Welch tests that compare the observed statistics with the simulated distribution.

Table S3: Effect of Comparative Noncognitive Skills on Student Performance, Controlling for Classroom Characteristics

	Linear (1)	Quadratic (2)	Cubic (3)	Quartic (4)	Quintic (5)	Nonlinear (6)
	Greek Language, Grade 10					
Unexcused Abs. Rank × Boy [1]	-0.018	-0.047***	-0.036**	-0.033**	-0.034**	-0.061***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Unexcused Abs. Rank × Girl [2]	-0.026**	-0.054***	-0.045***	-0.042***	-0.043***	-0.065***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Observations	342,913	342,913	342,913	342,913	342,913	342,913
Y Mean	0.002	0.002	0.002	0.002	0.002	0.002
Y SD	0.988	0.988	0.988	0.988	0.988	0.988
Gender Gap Y	0.469	0.469	0.469	0.469	0.469	0.469
P-value H0: [1]=[2]	0.568	0.617	0.525	0.499	0.513	0.767
	Mathematics, Grade 10					
Unexcused Abs. Rank × Boy [1]	-0.032**	-0.041***	-0.036**	-0.035**	-0.035**	-0.059***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Unexcused Abs. Rank × Girl [2]	-0.038***	-0.045***	-0.039***	-0.038***	-0.038***	-0.063***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Observations	342,300	342,300	342,300	342,300	342,300	342,300
Y Mean	0.079	0.079	0.079	0.079	0.079	0.079
Y SD	1.011	1.011	1.011	1.011	1.011	1.011
Gender Gap Y	0.106	0.106	0.106	0.106	0.106	0.106
P-value H0: [1]=[2]	0.705	0.742	0.823	0.809	0.864	0.749
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on student performance. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, leave-one-out classroom averages of grade 9 STEM performance, grade 9 non-STEM performance, and unexcused and total absences in grade 9. All specifications include classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S4: Effect of Comparative Noncognitive Skills on Unexcused Absences

	Linear (1)	Quadratic (2)	Cubic (3)	Quartic (4)	Quintic (5)	Nonlinear (6)
	Unexcused Absences, Grade 10					
Unexcused Abs. Rank × Boy [1]	13.622***	9.305***	8.416***	8.458***	8.578***	14.417***
	(0.538)	(0.536)	(0.531)	(0.530)	(0.532)	(0.478)
Unexcused Abs. Rank × Girl [2]	10.098***	5.804***	4.993***	5.029***	5.103***	10.974***
	(0.522)	(0.520)	(0.515)	(0.515)	(0.517)	(0.465)
Observations	341,381	341,381	341,381	341,381	341,381	341,381
Y Mean	57.646	57.646	57.646	57.646	57.646	57.646
Y SD	29.042	29.042	29.042	29.042	29.042	29.042
Gender Gap Y	-3.668	-3.668	-3.668	-3.668	-3.668	-3.668
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
	Unexcused Absences, Grade 11					
Unexcused Abs. Rank × Boy [1]	21.923***	14.931***	12.923***	13.029***	13.200***	18.630***
	(0.712)	(0.703)	(0.687)	(0.689)	(0.691)	(0.637)
Unexcused Abs. Rank × Girl [2]	17.920***	10.873***	8.806***	8.899***	8.992***	14.662***
	(0.688)	(0.680)	(0.666)	(0.668)	(0.670)	(0.613)
Observations	186,353	186,353	186,353	186,353	186,353	186,353
Y Mean	62.839	62.839	62.839	62.839	62.839	62.839
Y SD	29.994	29.994	29.994	29.994	29.994	29.994
Gender Gap Y	-2.593	-2.593	-2.593	-2.593	-2.593	-2.593
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
	Unexcused Absences, Grade 12					
Unexcused Abs. Rank × Boy [1]	19.787***	15.774***	15.633***	15.461***	15.591***	16.873***
	(0.750)	(0.757)	(0.754)	(0.756)	(0.758)	(0.702)
Unexcused Abs. Rank × Girl [2]	12.613***	8.606***	8.521***	8.403***	8.530***	10.108***
	(0.660)	(0.668)	(0.667)	(0.668)	(0.667)	(0.623)
Observations	171,697	171,697	171,697	171,697	171,697	171,697
Y Mean	51.745	51.745	51.745	51.745	51.745	51.745
Y SD	25.748	25.748	25.748	25.748	25.748	25.748
Gender Gap Y	-2.623	-2.623	-2.623	-2.623	-2.623	-2.623
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on unexcused absences. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S5: Effect of Comparative Noncognitive Skills on Total Absences

	Linear (1)	Quadratic (2)	Cubic (3)	Quartic (4)	Quintic (5)	Nonlinear (6)
	Total Absences, Grade 10					
Unexcused Abs. Rank × Boy [1]	12.354***	10.770***	9.221***	9.155***	9.421***	15.692***
	(0.633)	(0.657)	(0.648)	(0.648)	(0.647)	(0.582)
Unexcused Abs. Rank × Girl [2]	10.466***	8.922***	7.408***	7.353***	7.560***	13.858***
	(0.624)	(0.643)	(0.636)	(0.635)	(0.636)	(0.570)
Observations	341,381	341,381	341,381	341,381	341,381	341,381
Y Mean	70.078	70.078	70.078	70.078	70.078	70.078
Y SD	35.023	35.023	35.023	35.023	35.023	35.023
Gender Gap Y	-4.665	-4.665	-4.665	-4.665	-4.665	-4.665
P-value H0: [1]=[2]	0.001	0.001	0.001	0.001	0.001	0.001
	Total Absences, Grade 11					
Unexcused Abs. Rank × Boy [1]	12.484***	10.211***	7.871***	7.934***	8.360***	15.976***
	(0.797)	(0.842)	(0.830)	(0.831)	(0.838)	(0.788)
Unexcused Abs. Rank × Girl [2]	7.944***	5.628***	3.160***	3.212***	3.587***	11.577***
	(0.778)	(0.820)	(0.812)	(0.813)	(0.819)	(0.757)
Observations	186,353	186,353	186,353	186,353	186,353	186,353
Y Mean	77.742	77.742	77.742	77.742	77.742	77.742
Y SD	34.839	34.839	34.839	34.839	34.839	34.839
Gender Gap Y	-2.462	-2.462	-2.462	-2.462	-2.462	-2.462
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
	Total Absences, Grade 12					
Unexcused Abs. Rank × Boy [1]	18.864***	16.123***	15.795***	15.591***	15.814***	19.047***
	(1.015)	(1.060)	(1.058)	(1.063)	(1.066)	(0.974)
Unexcused Abs. Rank × Girl [2]	8.922***	6.146***	5.952***	5.846***	6.017***	9.486***
	(0.963)	(0.985)	(0.982)	(0.987)	(0.988)	(0.899)
Observations	171,697	171,697	171,697	171,697	171,697	171,697
Y Mean	89.022	89.022	89.022	89.022	89.022	89.022
Y SD	40.541	40.541	40.541	40.541	40.541	40.541
Gender Gap Y	-0.219	-0.219	-0.219	-0.219	-0.219	-0.219
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on total absences. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S6: Effect of Comparative Noncognitive Skills on Non-STEM Track Choice

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	Non-STEM Track Choice (1=Yes)					
Unexcused Abs. Rank × Boy [1]	-0.045***	-0.035***	-0.034***	-0.035***	-0.035***	-0.049***
	(0.011)	(0.012)	(0.012)	(0.012)	(0.012)	(0.011)
Unexcused Abs. Rank × Girl [2]	-0.023*	-0.013	-0.013	-0.014	-0.013	-0.025**
	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)
Observations	174,756	174,756	174,756	174,756	174,756	174,756
Y Mean	0.290	0.290	0.290	0.290	0.290	0.290
Y SD	0.454	0.454	0.454	0.454	0.454	0.454
Gender Gap Y	0.254	0.254	0.254	0.254	0.254	0.254
P-value H0: [1]=[2]	0.075	0.079	0.106	0.092	0.087	0.052
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on enrollment in a non-STEM track in grade 12. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S7: Effect of Comparative Noncognitive Skills on National Exams Participation

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	National Exams Participation (1=Yes)					
Unexcused Abs. Rank × Boy [1]	0.099***	0.055***	0.056***	0.059***	0.058***	0.044***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)
Unexcused Abs. Rank × Girl [2]	0.054***	0.015***	0.016***	0.018***	0.018***	0.006
	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)
Observations	171,697	171,697	171,697	171,697	171,697	171,697
Y Mean	0.965	0.965	0.965	0.965	0.965	0.965
Y SD	0.184	0.184	0.184	0.184	0.184	0.184
Gender Gap Y	0.015	0.015	0.015	0.015	0.015	0.015
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on the likelihood of participation in the national exams for university admission. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S8: Effect of Comparative Noncognitive Skills on National Exams Performance

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	National Exams Performance					
Unexcused Abs. Rank × Boy [1]	0.364***	0.305***	0.306***	0.310***	0.309***	0.258***
	(0.018)	(0.019)	(0.019)	(0.019)	(0.019)	(0.017)
Unexcused Abs. Rank × Girl [2]	0.103***	0.040**	0.040**	0.044***	0.044***	0.004
	(0.015)	(0.017)	(0.017)	(0.017)	(0.017)	(0.015)
Observations	168,630	168,630	168,630	168,630	168,630	168,630
Y Mean	-0.044	-0.044	-0.044	-0.044	-0.044	-0.044
Y SD	0.639	0.639	0.639	0.639	0.639	0.639
Gender Gap Y	0.041	0.041	0.041	0.041	0.041	0.041
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on national exam performance, measured as the average standardized score across the four mandatory subjects. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S9: Effect of Comparative Noncognitive Skills on Regular Public School Exit

	Linear (1)	Quadratic (2)	Cubic (3)	Quartic (4)	Quintic (5)	Nonlinear (6)
	Regular Public School Exit at Grade 11 (1=Yes)					
Unexcused Abs. Rank × Boy [1]	0.015*	0.038***	0.035***	0.034***	0.034***	0.034***
	(0.008)	(0.009)	(0.009)	(0.009)	(0.009)	(0.008)
Unexcused Abs. Rank × Girl [2]	0.014*	0.036***	0.033***	0.032***	0.031***	0.031***
	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)	(0.007)
Observations	205,894	205,894	205,894	205,894	205,894	205,894
Y Mean	0.095	0.095	0.095	0.095	0.095	0.095
Y SD	0.293	0.293	0.293	0.293	0.293	0.293
Gender Gap Y	-0.054	-0.054	-0.054	-0.054	-0.054	-0.054
P-value H0: [1]=[2]	0.883	0.736	0.761	0.803	0.759	0.672
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on exiting regular public schools at grade 11. Regular public school exit is defined as not being observed in a regular public secondary school after grade 10, whether due to transfer to vocational, evening, or private schooling, or permanent exit from the education system. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S10: Effect of Comparative Noncognitive Skills on Public School Dropout

	Linear (1)	Quadratic (2)	Cubic (3)	Quartic (4)	Quintic (5)	Nonlinear (6)
	Public School Dropout at Grade 11 (1=Yes)					
Unexcused Abs. Rank × Boy [1]	0.005	0.022***	0.020***	0.018***	0.018***	0.011***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)
Unexcused Abs. Rank × Girl [2]	-0.000	0.015***	0.014***	0.013***	0.013***	0.004
	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.003)
Observations	206,219	206,219	206,219	206,219	206,219	206,219
Y Mean	0.015	0.015	0.015	0.015	0.015	0.015
Y SD	0.122	0.122	0.122	0.122	0.122	0.122
Gender Gap Y	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
P-value H0: [1]=[2]	0.068	0.018	0.067	0.083	0.067	0.028
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on public school dropout at grade 11. Public school dropout is defined as not being observed in any public secondary school after grade 10 (regular, vocational, or evening). Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S11: Effect of Comparative Noncognitive Skills on High-earning Program Admission, All Exam Takers

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	High-earning Program Admission (1=Yes)					
Unexcused Abs. Rank × Boy [1]	0.104***	0.087***	0.087***	0.087***	0.087***	0.084***
	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.012)
Unexcused Abs. Rank × Girl [2]	0.011	-0.006	-0.006	-0.007	-0.008	-0.006
	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)	(0.012)
Observations	165,635	165,635	165,635	165,635	165,635	165,635
Y Mean	0.207	0.207	0.207	0.207	0.207	0.207
Y SD	0.405	0.405	0.405	0.405	0.405	0.405
Gender Gap Y	-0.039	-0.039	-0.039	-0.039	-0.039	-0.039
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on the likelihood of high-earning program admission (i.e., degree programs with expected earnings in the top quartile) among all participants in the national exams for university admission. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S12: Effect of Comparative Noncognitive Skills on University Admission

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	University Admission (1=Yes)					
Unexcused Abs. Rank × Boy [1]	0.125***	0.102***	0.102***	0.106***	0.105***	0.099***
	(0.011)	(0.012)	(0.012)	(0.012)	(0.012)	(0.011)
Unexcused Abs. Rank × Girl [2]	0.030***	0.003	0.003	0.006	0.005	0.001
	(0.010)	(0.011)	(0.011)	(0.011)	(0.011)	(0.010)
Observations	165,635	165,635	165,635	165,635	165,635	165,635
Y Mean	0.742	0.742	0.742	0.742	0.742	0.742
Y SD	0.438	0.438	0.438	0.438	0.438	0.438
Gender Gap Y	0.050	0.050	0.050	0.050	0.050	0.050
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on the likelihood of university admission. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S13: Effect of Comparative Noncognitive Skills on Expected Labor-Market Outcomes

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	Log Expected Salary					
Unexcused Abs. Rank × Boy [1]	0.047***	0.038***	0.038***	0.039***	0.039***	0.040***
	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)	(0.007)
Unexcused Abs. Rank × Girl [2]	0.007	-0.003	-0.003	-0.003	-0.003	0.002
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Observations	125,079	125,079	125,079	125,079	125,079	125,079
Y Mean	7.123	7.123	7.123	7.123	7.123	7.123
Y SD	0.210	0.210	0.210	0.210	0.210	0.210
Gender Gap Y	-0.051	-0.051	-0.051	-0.051	-0.051	-0.051
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on expected earnings—measured as the mean earnings of graduates from the student's admitted degree program. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S14: Effect of Comparative Cognitive & Noncognitive Skills on Competitive STEM Track Choice

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	Competitive STEM Track Choice (1=Yes)					
Unexcused Abs. Rank × Boy [1]	0.018	0.035**	0.034**	0.033**	0.031**	0.023*
	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)
Unexcused Abs. Rank × Girl [2]	-0.051***	-0.034**	-0.033**	-0.035**	-0.036***	-0.044***
	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)
Prior Performance Rank × Boy [3]	0.242***	0.073***	0.076***	0.078***	0.078***	0.090***
	(0.014)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Prior Performance Rank × Girl [4]	0.177***	0.028*	0.032**	0.036**	0.035**	0.049***
	(0.013)	(0.015)	(0.015)	(0.016)	(0.016)	(0.015)
Prior STEM Performance Rank × Boy [5]	0.154***	0.159***	0.156***	0.156***	0.156***	0.156***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Prior STEM Performance Rank × Girl [6]	0.258***	0.256***	0.253***	0.252***	0.252***	0.254***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Observations	174,756	174,756	174,756	174,756	174,756	174,756
Y Mean	0.333	0.333	0.333	0.333	0.333	0.333
Y SD	0.471	0.471	0.471	0.471	0.471	0.471
Gender Gap Y	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
P-value H0: [3]=[4]	0.000	0.010	0.012	0.013	0.013	0.016
P-value H0: [5]=[6]	0.000	0.000	0.000	0.000	0.000	0.000
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative cognitive and noncognitive skills on enrollment in a competitive STEM track in grade 12. Comparative cognitive skills are measured using each student's classroom rank in grade 9 performance in Non-STEM (i.e., Greek Language) and STEM (i.e., Mathematics) subjects. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S15: Effect of Comparative Cognitive & Noncognitive Skills on Non-competitive STEM Track Choice

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	Noncompetitive STEM Track Choice (1=Yes)					
Unexcused Abs. Rank × Boy [1]	-0.279***	-0.289***	-0.287***	-0.284***	-0.283***	-0.243***
	(0.011)	(0.012)	(0.012)	(0.012)	(0.012)	(0.011)
Unexcused Abs. Rank × Girl [2]	0.091***	0.095***	0.094***	0.096***	0.097***	0.112***
	(0.010)	(0.011)	(0.011)	(0.011)	(0.011)	(0.010)
Prior Non-STEM Performance Rank × Boy [3]	-0.224***	-0.074***	-0.076***	-0.078***	-0.077***	-0.090***
	(0.014)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Prior Non-STEM Performance Rank × Girl [4]	-0.202***	-0.069***	-0.071***	-0.072***	-0.071***	-0.083***
	(0.012)	(0.015)	(0.015)	(0.015)	(0.015)	(0.014)
Prior STEM Performance Rank × Boy [5]	-0.089***	-0.093***	-0.091***	-0.090***	-0.090***	-0.089***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Prior STEM Performance Rank × Girl [6]	-0.058***	-0.057***	-0.055***	-0.055***	-0.055***	-0.055***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)	(0.013)
Observations	174,756	174,756	174,756	174,756	174,756	174,756
Y Mean	0.267	0.267	0.267	0.267	0.267	0.267
Y SD	0.443	0.443	0.443	0.443	0.443	0.443
Gender Gap Y	-0.173	-0.173	-0.173	-0.173	-0.173	-0.173
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
P-value H0: [3]=[4]	0.140	0.740	0.760	0.713	0.727	0.665
P-value H0: [5]=[6]	0.063	0.031	0.032	0.034	0.035	0.041
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative cognitive and noncognitive skills on enrollment in a non-competitive STEM track. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S16: Effect of Comparative Noncognitive Skills on Grade 10 Performance, by Student Prior Unexcused Absences

	Linear (1)	Quadratic (2)	Cubic (3)	Quartic (4)	Quintic (5)	Nonlinear (6)
	Greek Language, Grade 10					
Unexcused Abs. Rank × Boy × Above Median [1]	-0.049***	-0.083***	-0.067***	-0.071***	-0.071***	-0.103***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.017)
Unexcused Abs. Rank × Girl × Above Median [2]	-0.035**	-0.066***	-0.056***	-0.058***	-0.058***	-0.085***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Unexcused Abs. Rank × Boy × Below Median [3]	0.038**	0.009	0.012	0.012	0.012	-0.015
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.016)
Unexcused Abs. Rank × Girl × Below Median [4]	0.005	-0.024	-0.020	-0.020	-0.020	-0.043***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.015)
Observations	342,913	342,913	342,913	342,913	342,913	342,913
Y Mean	0.002	0.002	0.002	0.002	0.002	0.002
Y SD	0.988	0.988	0.988	0.988	0.988	0.988
Gender Gap Y	0.469	0.469	0.469	0.469	0.469	0.469
P-value H0: [1]=[2]	0.504	0.401	0.564	0.518	0.512	0.357
P-value H0: [3]=[4]	0.066	0.058	0.066	0.067	0.066	0.111
P-value H0: [1]=[3]	0.000	0.000	0.000	0.000	0.000	0.000
P-value H0: [2]=[4]	0.025	0.021	0.051	0.036	0.037	0.018
	Mathematics, Grade 10					
Unexcused Abs. Rank × Boy × Above Median [1]	-0.048***	-0.070***	-0.063***	-0.064***	-0.064***	-0.093***
	(0.017)	(0.017)	(0.018)	(0.018)	(0.018)	(0.017)
Unexcused Abs. Rank × Girl × Above Median [2]	-0.040**	-0.063***	-0.057***	-0.057***	-0.057***	-0.086***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Unexcused Abs. Rank × Boy × Below Median [3]	0.024	0.004	0.005	0.005	0.005	-0.023
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.017)
Unexcused Abs. Rank × Girl × Below Median [4]	0.009	-0.010	-0.008	-0.008	-0.008	-0.040**
	(0.017)	(0.018)	(0.018)	(0.018)	(0.018)	(0.016)
Observations	342,300	342,300	342,300	342,300	342,300	342,300
Y Mean	0.079	0.079	0.079	0.079	0.079	0.079
Y SD	1.011	1.011	1.011	1.011	1.011	1.011
Gender Gap Y	0.106	0.106	0.106	0.106	0.106	0.106
P-value H0: [1]=[2]	0.652	0.735	0.768	0.744	0.745	0.708
P-value H0: [3]=[4]	0.427	0.482	0.498	0.501	0.505	0.366
P-value H0: [1]=[3]	0.000	0.000	0.001	0.001	0.001	0.000
P-value H0: [2]=[4]	0.013	0.007	0.013	0.012	0.012	0.017
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the heterogeneous effects of comparative noncognitive skills on student performance by student prior unexcused absences (above and below the prior median grade 9 unexcused absences). Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S17: Effect of Comparative Noncognitive Skills on Grade 10 Performance, by Student Prior Performance

	Linear (1)	Quadratic (2)	Cubic (3)	Quartic (4)	Quintic (5)	Nonlinear (6)
	Greek Language, Grade 10					
Unexcused Abs. Rank × Boy × Above Median [1]	0.036**	0.019	0.027	0.029*	0.028	-0.002
	(0.017)	(0.018)	(0.018)	(0.018)	(0.018)	(0.017)
Unexcused Abs. Rank × Girl × Above Median [2]	-0.020	-0.044***	-0.038**	-0.035**	-0.035**	-0.058***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.014)
Unexcused Abs. Rank × Boy × Below Median [3]	-0.041**	-0.085***	-0.074***	-0.067***	-0.068***	-0.094***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.017)
Unexcused Abs. Rank × Girl × Below Median [4]	-0.029*	-0.069***	-0.057***	-0.052***	-0.055***	-0.076***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.017)
Observations	342,913	342,913	342,913	342,913	342,913	342,913
Y Mean	0.002	0.002	0.002	0.002	0.002	0.002
Y SD	0.988	0.988	0.988	0.988	0.988	0.988
Gender Gap Y	0.469	0.469	0.469	0.469	0.469	0.469
P-value H0: [1]=[2]	0.001	0.000	0.000	0.000	0.000	0.001
P-value H0: [3]=[4]	0.545	0.412	0.380	0.440	0.520	0.332
P-value H0: [1]=[3]	0.000	0.000	0.000	0.000	0.000	0.000
P-value H0: [2]=[4]	0.642	0.214	0.345	0.403	0.313	0.367
	Mathematics, Grade 10					
Unexcused Abs. Rank × Boy × Above Median [1]	-0.032*	-0.046**	-0.037**	-0.036*	-0.037**	-0.063***
	(0.018)	(0.019)	(0.019)	(0.019)	(0.019)	(0.018)
Unexcused Abs. Rank × Girl × Above Median [2]	-0.040**	-0.046***	-0.037**	-0.035**	-0.035**	-0.062***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Unexcused Abs. Rank × Boy × Below Median [3]	-0.015	-0.056***	-0.056***	-0.049***	-0.045***	-0.073***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.016)
Unexcused Abs. Rank × Girl × Below Median [4]	-0.009	-0.061***	-0.060***	-0.054***	-0.049***	-0.080***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.016)
Observations	342,300	342,300	342,300	342,300	342,300	342,300
Y Mean	0.079	0.079	0.079	0.079	0.079	0.079
Y SD	1.011	1.011	1.011	1.011	1.011	1.011
Gender Gap Y	0.106	0.106	0.106	0.106	0.106	0.106
P-value H0: [1]=[2]	0.710	0.987	0.982	0.963	0.913	0.946
P-value H0: [3]=[4]	0.762	0.794	0.815	0.810	0.820	0.708
P-value H0: [1]=[3]	0.395	0.614	0.369	0.520	0.700	0.632
P-value H0: [2]=[4]	0.123	0.454	0.237	0.346	0.469	0.361
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the heterogeneous effects of comparative noncognitive skills on student performance by student prior academic achievement (above and below the prior median student performance). Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S18: Effect of Comparative Noncognitive Skills on Grade 10 Performance, by School Average Growth

	Linear (1)	Quadratic (2)	Cubic (3)	Quartic (4)	Quintic (5)	Nonlinear (6)
	Greek Language, Grade 10					
Unexcused Abs. Rank × Boy × Above Median [1]	-0.031	-0.071***	-0.058***	-0.053***	-0.055***	-0.079***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.018)
Unexcused Abs. Rank × Girl × Above Median [2]	-0.033*	-0.069***	-0.059***	-0.056***	-0.057***	-0.076***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.017)
Unexcused Abs. Rank × Boy × Below Median [3]	-0.003	-0.020	-0.012	-0.010	-0.012	-0.044**
	(0.020)	(0.021)	(0.021)	(0.021)	(0.021)	(0.019)
Unexcused Abs. Rank × Girl × Below Median [4]	-0.018	-0.037*	-0.029	-0.027	-0.029	-0.056***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.018)
Observations	342,913	342,913	342,913	342,913	342,913	342,913
Y Mean	0.002	0.002	0.002	0.002	0.002	0.002
Y SD	0.988	0.988	0.988	0.988	0.988	0.988
Gender Gap Y	0.469	0.469	0.469	0.469	0.469	0.469
P-value H0: [1]=[2]	0.899	0.916	0.935	0.879	0.909	0.869
P-value H0: [3]=[4]	0.454	0.389	0.388	0.393	0.390	0.528
P-value H0: [1]=[3]	0.326	0.069	0.112	0.130	0.132	0.181
P-value H0: [2]=[4]	0.550	0.215	0.263	0.274	0.292	0.419
	Mathematics, Grade 10					
Unexcused Abs. Rank × Boy × Above Median [1]	-0.008	-0.023	-0.016	-0.014	-0.016	-0.050***
	(0.020)	(0.020)	(0.021)	(0.021)	(0.021)	(0.019)
Unexcused Abs. Rank × Girl × Above Median [2]	-0.025	-0.039*	-0.032	-0.030	-0.031	-0.066***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)
Unexcused Abs. Rank × Boy × Below Median [3]	-0.046**	-0.049**	-0.046**	-0.045**	-0.045**	-0.068***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)
Unexcused Abs. Rank × Girl × Below Median [4]	-0.040**	-0.042**	-0.036*	-0.036*	-0.035*	-0.061***
	(0.019)	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)
Observations	342,300	342,300	342,300	342,300	342,300	342,300
Y Mean	0.079	0.079	0.079	0.079	0.079	0.079
Y SD	1.011	1.011	1.011	1.011	1.011	1.011
Gender Gap Y	0.106	0.106	0.106	0.106	0.106	0.106
P-value H0: [1]=[2]	0.365	0.405	0.408	0.407	0.436	0.385
P-value H0: [3]=[4]	0.723	0.722	0.624	0.639	0.605	0.699
P-value H0: [1]=[3]	0.163	0.375	0.295	0.280	0.316	0.485
P-value H0: [2]=[4]	0.607	0.935	0.879	0.841	0.902	0.834
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the heterogeneous effects of comparative noncognitive skills on student performance by school cohort prior academic achievement (above and below the average school growth, measured as the mean difference between final exam scores in grades 9 and 10). Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S19: Effect of Same-Gender Comparative Noncognitive Skills on STEM Track Choice

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	Competitive STEM Track Choice (1=Yes)					
Same-gender Unexc. Abs. Rank × Boy [1]	0.007	0.015	0.015	0.014	0.013	0.010
	(0.009)	(0.010)	(0.010)	(0.010)	(0.010)	(0.009)
Same-gender Unexc. Abs. Rank × Girl [2]	-0.045***	-0.035***	-0.034***	-0.035***	-0.035***	-0.040***
	(0.009)	(0.010)	(0.010)	(0.010)	(0.010)	(0.009)
Observations	174,697	174,697	174,697	174,697	174,697	174,697
Y Mean	0.333	0.333	0.333	0.333	0.333	0.333
Y SD	0.471	0.471	0.471	0.471	0.471	0.471
Gender Gap Y	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
	Noncompetitive STEM Track Choice (1=Yes)					
Same-gender Unexc. Abs. Rank × Boy [1]	-0.179***	-0.179***	-0.178***	-0.176***	-0.175***	-0.161***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Same-gender Unexc. Abs. Rank × Girl [2]	0.114***	0.123***	0.122***	0.123***	0.124***	0.123***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Observations	174,697	174,697	174,697	174,697	174,697	174,697
Y Mean	0.266	0.266	0.266	0.266	0.266	0.266
Y SD	0.442	0.442	0.442	0.442	0.442	0.442
Gender Gap Y	-0.172	-0.172	-0.172	-0.172	-0.172	-0.172
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of same-gender comparative noncognitive skills on student performance. Same-gender comparative noncognitive skills are measured using each student's rank in grade 9 unexcused absences among classroom peers of the same gender. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S20: Effect of Within-Cohort Comparative Noncognitive Skills on STEM Track Choice

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	Competitive STEM Track Choice (1=Yes)					
Cohort Unexc. Abs. Rank × Boy [1]	-0.006	0.001	0.002	0.001	0.001	-0.003
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)
Cohort Unexc. Abs. Rank × Girl [2]	-0.005	0.002	0.003	0.002	0.001	-0.002
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.004)
Observations	174,756	174,756	174,756	174,756	174,756	174,756
Y Mean	0.333	0.333	0.333	0.333	0.333	0.333
Y SD	0.471	0.471	0.471	0.471	0.471	0.471
Gender Gap Y	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009
P-value H0: [1]=[2]	0.058	0.396	0.607	0.506	0.477	0.167
	Noncompetitive STEM Track Choice (1=Yes)					
Cohort Unexc. Abs. Rank × Boy [1]	0.013***	0.017***	0.012**	0.015***	0.015***	0.018***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)
Cohort Unexc. Abs. Rank × Girl [2]	0.008*	0.012***	0.008	0.010**	0.010**	0.013***
	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)
Observations	174,756	174,756	174,756	174,756	174,756	174,756
Y Mean	0.266	0.266	0.266	0.266	0.266	0.266
Y SD	0.442	0.442	0.442	0.442	0.442	0.442
Gender Gap Y	-0.172	-0.172	-0.172	-0.172	-0.172	-0.172
P-value H0: [1]=[2]	0.024	0.015	0.016	0.012	0.012	0.011
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of within-school-cohort comparative noncognitive skills on student performance. Within-school-cohort comparative noncognitive skills are measured using each student's rank in grade 9 unexcused absences among all peers in the same school cohort. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S21: Effect of Comparative Noncognitive Skills on Grade 11 Performance, Accounting for Main Sample Attrition

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	Greek Language, Grade 11					
Unexcused Abs. Rank × Boy [1]	-0.057	-0.086**	-0.082**	-0.080**	-0.083**	-0.125***
	(0.036)	(0.037)	(0.037)	(0.037)	(0.037)	(0.034)
Unexcused Abs. Rank × Girl [2]	-0.042	-0.071**	-0.066**	-0.063**	-0.067**	-0.108***
	(0.029)	(0.031)	(0.031)	(0.031)	(0.031)	(0.029)
Observations	186,735	186,735	186,735	186,735	186,735	186,735
Y Mean	0.008	0.008	0.008	0.008	0.008	0.008
Y SD	0.984	0.984	0.984	0.984	0.984	0.984
Gender Gap Y	0.443	0.443	0.443	0.443	0.443	0.443
P-value H0: [1]=[2]	0.654	0.652	0.623	0.632	0.641	0.614
	Mathematics, Grade 11					
Unexcused Abs. Rank × Boy [1]	-0.123**	-0.102*	-0.102*	-0.104*	-0.109*	-0.161***
	(0.056)	(0.056)	(0.056)	(0.056)	(0.056)	(0.053)
Unexcused Abs. Rank × Girl [2]	-0.081	-0.051	-0.047	-0.048	-0.054	-0.117**
	(0.050)	(0.050)	(0.050)	(0.050)	(0.051)	(0.047)
Observations	144,206	144,206	144,206	144,206	144,206	144,206
Y Mean	0.066	0.066	0.066	0.066	0.066	0.066
Y SD	1.023	1.023	1.023	1.023	1.023	1.023
Gender Gap Y	-0.034	-0.034	-0.034	-0.034	-0.034	-0.034
P-value H0: [1]=[2]	0.439	0.342	0.300	0.301	0.298	0.397
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on grade 11 student performance using inverted probability weights to account for main sample attrition (i.e., exit from regular public schools) after grade 10. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S22: Effect of Comparative Noncognitive Skills on STEM Track Choice, Accounting for Main Sample Attrition

	Linear (1)	Quadratic (2)	Cubic (3)	Quartic (4)	Quintic (5)	Nonlinear (6)
	Competitive STEM Track Choice (1=Yes)					
Unexcused Abs. Rank × Boy [1]	-0.001	0.023	0.020	0.017	0.015	0.012
	(0.017)	(0.019)	(0.019)	(0.019)	(0.019)	(0.018)
Unexcused Abs. Rank × Girl [2]	-0.076***	-0.054***	-0.053***	-0.056***	-0.059***	-0.061***
	(0.017)	(0.019)	(0.019)	(0.019)	(0.019)	(0.018)
Observations	174,756	174,756	174,756	174,756	174,756	174,756
Y Mean	0.333	0.333	0.333	0.333	0.333	0.333
Y SD	0.471	0.471	0.471	0.471	0.471	0.471
Gender Gap Y	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
	Noncompetitive STEM Track Choice (1=Yes)					
Unexcused Abs. Rank × Boy [1]	-0.306***	-0.320***	-0.314***	-0.310***	-0.310***	-0.275***
	(0.013)	(0.015)	(0.015)	(0.016)	(0.016)	(0.014)
Unexcused Abs. Rank × Girl [2]	0.105***	0.106***	0.107***	0.111***	0.111***	0.123***
	(0.012)	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)
Observations	174,756	174,756	174,756	174,756	174,756	174,756
Y Mean	0.267	0.267	0.267	0.267	0.267	0.267
Y SD	0.443	0.443	0.443	0.443	0.443	0.443
Gender Gap Y	-0.173	-0.173	-0.173	-0.173	-0.173	-0.173
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on enrollment in a competitive STEM track and non-competitive STEM track in grade 12 using inverted probability weights to account for main sample attrition (i.e., exit from regular public schools) after grade 10. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S23: Effect of Comparative Noncognitive Skills on Non-STEM Track Choice, Accounting for Main Sample Attrition

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	Non-STEM Track Choice (1=Yes)					
Unexcused Abs. Rank × Boy [1]	-0.050***	-0.034**	-0.030*	-0.031*	-0.029*	-0.041***
	(0.015)	(0.016)	(0.016)	(0.016)	(0.016)	(0.015)
Unexcused Abs. Rank × Girl [2]	-0.018	-0.006	-0.007	-0.006	-0.003	-0.010
	(0.017)	(0.018)	(0.018)	(0.018)	(0.018)	(0.017)
Observations	174,756	174,756	174,756	174,756	174,756	174,756
Y Mean	0.290	0.290	0.290	0.290	0.290	0.290
Y SD	0.454	0.454	0.454	0.454	0.454	0.454
Gender Gap Y	0.254	0.254	0.254	0.254	0.254	0.254
P-value H0: [1]=[2]	0.048	0.087	0.161	0.138	0.131	0.059
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on enrollment in a non-STEM track in grade 12 using inverted probability weights to account for attrition (i.e., exit from regular public schools) after grade 10. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S24: Effect of Comparative Noncognitive Skills on Expected Labor-Market Outcomes, Treating Main Sample Attrition as an Adverse Outcome

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	Log Expected Salary					
Unexcused Abs. Rank × Boy [1]	0.025***	0.019***	0.019***	0.020***	0.021***	0.023***
	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)	(0.006)
Unexcused Abs. Rank × Girl [2]	0.003	-0.004	-0.004	-0.004	-0.004	0.001
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Observations	143,831	143,831	143,831	143,831	143,831	143,831
Y Mean	7.064	7.064	7.064	7.064	7.064	7.064
Y SD	0.245	0.245	0.245	0.245	0.245	0.245
Gender Gap Y	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
P-value H0: [1]=[2]	0.000	0.000	0.000	0.000	0.000	0.000
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on expected earnings—measured as the mean earnings of graduates from the student's admitted degree program—using a conservative composite-outcome specification that incorporates main sample attrition (i.e., exit from regular public schools). Students who exit the regular public school system after grade 10 are assigned the lowest observed value of the outcome variable, so that dropout is treated as the worst educational realization rather than as missing data. This procedure provides a lower-bound robustness check for the main estimates. Comparative noncognitive skills are measured using each student's classroom rank in grade 9 unexcused absences. Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, unexcused and total absences in grade 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S25: Effect of Comparative Noncognitive Skills on Student Performance Using an Alternative Definition: Rank in Mean Unexcused Absences in Grades 7–9

	Linear	Quadratic	Cubic	Quartic	Quintic	Nonlinear
	(1)	(2)	(3)	(4)	(5)	(6)
	Greek Language, Grade 10					
Grades 7–9 Unexcused Abs. Rank × Boy [1]	-0.068***	-0.095***	-0.079***	-0.072***	-0.084***	-0.176***
	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)	(0.010)
Grades 7–9 Unexcused Abs. Rank × Girl [2]	-0.055***	-0.083***	-0.069***	-0.065***	-0.072***	-0.156***
	(0.011)	(0.012)	(0.012)	(0.012)	(0.012)	(0.010)
Observations	344,767	344,767	344,767	344,767	344,767	344,767
Y Mean	0.004	0.004	0.004	0.004	0.004	0.004
Y SD	0.988	0.988	0.988	0.988	0.988	0.988
Gender Gap Y	0.468	0.468	0.468	0.468	0.468	0.468
P-value H0: [1]=[2]	0.283	0.305	0.402	0.609	0.311	0.086
	Mathematics, Grade 10					
Grades 7–9 Unexcused Abs. Rank × Boy [1]	-0.075***	-0.076***	-0.071***	-0.072***	-0.072***	-0.096***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Grades 7–9 Unexcused Abs. Rank × Girl [2]	-0.079***	-0.080***	-0.074***	-0.072***	-0.071***	-0.099***
	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)	(0.012)
Observations	344,152	344,152	344,152	344,152	344,152	344,152
Y Mean	0.081	0.081	0.081	0.081	0.081	0.081
Y SD	1.011	1.011	1.011	1.011	1.011	1.011
Gender Gap Y	0.106	0.106	0.106	0.106	0.106	0.106
P-value H0: [1]=[2]	0.728	0.767	0.808	0.988	0.979	0.819
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the estimated effects of comparative noncognitive skills on student performance using an alternative definition. Here, comparative noncognitive skills are measured by each student's classroom rank in the mean unexcused absences in middle school grades (i.e., grades 7 through 9). Each column corresponds to a different specification: linear, polynomial of increasing order (columns 1–5), and a nonlinear specification (column 6). All regressions control for student gender, STEM, non-STEM performance in grade 9, mean unexcused and mean total absences in grades 7 through 9, interactions of individual terms with gender, and classroom fixed effects. Standard errors are clustered at school-cohort level. Interaction terms with female are included to capture gender-specific effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table S26: Survey Participant Characteristics

	Comparatively Cooperative			*Comparatively Noncooperative*				
Panel A: Participant Characteristics								
	Mean	SD	N	Mean	SD	N	Diff.	P-value
Age (Years)	51.4	9.4	169	51.1	8.6	175	-0.292	0.763
	%		N	%		N	Diff.	P-value
Female	68.6		169	69.7		175	1.075	0.830
Highest Degree: Bachelor's	29.0		169	29.7		175	0.720	0.884
Highest Degree: Master's	61.5		169	61.1		175	-0.396	0.940
Highest Degree: Doctorate	9.5		169	9.1		175	-0.325	0.918
Studied Abroad	27.2		169	26.9		175	-0.362	0.940
Secondary School Education	66.3		169	70.9		175	4.585	0.361
Primary School Education	16.6		169	16.6		175	0.003	0.999
Pre-school Education	8.9		169	8.0		175	-0.876	0.771
Panel B: Growth Mindset								
	Mean	SD	N	Mean	SD	N	Diff.	P-value
Score	2.2	2.5	169	2.2	2.5	175	0.017	0.949

Notes: Panel A reports summary statistics for survey participant characteristics separately by experimental condition (Cooperative vs. Noncooperative). For continuous variables, the table reports means and standard deviations; for binary and categorical variables, it reports percentages. N denotes the number of non-missing observations for each characteristic. "Diff." reports the difference in means (or percentages) between the Noncooperative and Cooperative groups. p-values are from two-sided tests of equality across conditions. Panel B reports summary statistics for the growth mindset measure (Claro et al., 2016), based on participants' agreement with the statement: "You can always significantly change how intelligent you are." Responses are measured on a scale ranging from -5 to 5, with higher values indicating stronger agreement.

Table S27: Teacher Perceptions of Student Motivation, Behavior, and Discipline by Student Profile

	Student Profile						
	Comparatively Cooperative		*Comparatively Uncooperative*				
	Mean	SD	Mean	SD	Diff.	P-value	Romano-Wolf P-value
Statement	(1)	(2)	(3)	(4)	(3) − (1)	(6)	(7)
Perceptions about the Student:							
This student has weak motivation for learning.	-1.533	3.028	1.349	2.955	2.881	0.000	0.000
This student exhibits weak self-control and poor organization.	-1.899	2.894	2.091	2.367	3.991	0.000	0.000
It is likely that the student will experience academic performance problems during the year.	-0.704	2.703	2.394	2.207	3.098	0.000	0.000
It is likely that the student will experience behavior and/or attendance problems during the year.	-1.095	2.728	2.291	2.131	3.386	0.000	0.000
Perceptions about the School Environment:							
This student is likely to be perceived as a by the teaching staff.	-1.716	2.686	1.897	2.731	3.613	0.000	0.000
This student is likely to acquire a reputation that is difficult to change.	-0.982	2.961	1.309	2.803	2.291	0.000	0.000
Minor incidents involving this student are likely to be interpreted more negatively compared with others.	-0.663	2.925	2.091	2.415	2.754	0.000	0.000
Expected Actions:							
I would proactively ensure regular communication with this student.	2.000	2.370	3.583	1.672	1.583	0.000	0.000
I would be more likely to proceed with formal disciplinary action (suspension) in the case of disruptive behavior by this student.	-2.556	2.456	-1.303	2.722	1.253	0.000	0.000
I would contact this student's parents/guardians early in the school year.	2.095	2.608	3.057	2.397	0.962	0.000	0.000
N	169		175				

Notes: This table reports mean agreement scores and standard deviations for teachers' perceptions of and intended responses to a hypothetical student, by assigned student profile (Cooperative vs. Uncooperative). Responses are measured on a 11-point scale ranging from –5 (Completely disagree) to +5 (Completely agree). Columns (1) and (2) report the mean and standard deviation for the cooperative student profile, respectively. Columns (3) and (4) report the mean and standard deviation for the uncooperative student profile, respectively. Column (5) reports the difference in means, computed as Uncooperative minus Cooperative. Column (6) reports p-values from Welch two-sample t-tests of equality of means. Column (7) reports p-values computed based on the Romano-Wolf step-down procedure using 5,000 bootstrap replications (see Clarke et al. 2020; Romano and Wolf 2005).

Table S28: Teacher Attributions for Student Behavior and Attendance Changes by Student Profile

	Student Profile						
	Comparatively Cooperative		*Comparatively Uncooperative*				
	Mean	SD	Mean	SD	Diff.	P-value	Romano-Wolf P-value
Statement	(1)	(2)	(3)	(4)	(3) − (1)	(6)	(7)
If this student's **behavior and/or attendance worsens**, it will be mainly due to:							
the student's own effort or motivation.	2.101	1.303	2.549	1.235	0.448	0.001	0.010
the student's own self-regulation and organization.	2.278	1.309	2.811	1.191	0.533	0.000	0.001
teachers' instructional practices or classroom management.	3.704	1.116	4.126	0.875	0.422	0.000	0.001
relationships with classmates.	2.899	1.233	3.069	1.168	0.169	0.192	0.583
factors outside of school (e.g., family environment).	3.337	1.224	3.491	0.988	0.154	0.201	0.583
If this student's **behavior and/or attendance improves**, it will be mainly due to:							
the student's own effort or motivation.	3.728	0.998	3.823	0.969	0.095	0.371	0.666
the student's own self-regulation and organization.	3.704	1.021	3.777	0.978	0.073	0.499	0.736
teachers' instructional practices or classroom management.	3.834	0.992	3.857	1.138	0.023	0.843	0.843
relationships with classmates.	3.686	0.921	3.989	0.877	0.302	0.002	0.016
factors outside of school (e.g., family environment).	3.621	1.107	3.886	0.988	0.264	0.020	0.097
N	169		175				

Notes: This table reports mean agreement scores and standard deviations for teachers' attributions regarding the causes of student behavior and/or attendance problems and improvements, by experimentally assigned student profile (Cooperative vs. Uncooperative). Responses are measured on a 6-point scale ranging from 0 to 5, where higher values indicate stronger agreement. Columns (1) and (2) report the mean and standard deviation for the cooperative student profile, respectively. Columns (3) and (4) report the mean and standard deviation for the uncooperative student profile, respectively. Column (5) reports the difference in means, computed as Uncooperative minus Cooperative. Column (6) reports p-values from Welch two-sample t-tests of equality of means. Column (7) reports p-values computed based on the Romano-Wolf step-down procedure using 5,000 bootstrap replications (see Clarke et al. 2020; Romano and Wolf 2005).

Table S29: Teacher Attributions for Student Performance Changes by Student Profile

	Student Profile						
	Comparatively Cooperative		*Comparatively Uncooperative*				
	Mean	SD	Mean	SD	Diff.	P-value	Romano-Wolf P-value
Statement	(1)	(2)	(3)	(4)	(3) – (1)	(6)	(7)
If this student's **academic performance worsens**, it will be due to:							
the student's own effort or motivation.	2.633	1.275	2.994	1.162	0.361	0.006	0.042
the student's own self-regulation and organization.	2.698	1.238	3.063	1.155	0.365	0.005	0.037
teachers' instructional practices or classroom management.	3.698	1.045	4.017	0.968	0.319	0.004	0.027
relationships with classmates.	3.018	1.242	3.177	1.128	0.159	0.214	0.636
factors outside of school (e.g., family environment).	3.130	1.298	3.234	1.253	0.104	0.450	0.771
If this student's **academic performance improves**, it will be due to:							
the student's own effort or motivation.	4.000	0.926	3.931	0.944	-0.069	0.497	0.771
the student's own self-regulation and organization.	3.893	0.964	3.914	0.940	0.021	0.840	0.842
teachers' instructional practices or classroom management.	3.781	1.072	3.891	1.106	0.110	0.348	0.761
relationships with classmates.	3.834	0.911	3.994	0.848	0.160	0.093	0.389
factors outside of school (e.g., family environment).	3.391	1.259	3.766	1.049	0.375	0.003	0.026
N	169		175				

Notes: This table reports mean agreement scores and standard deviations for teachers' attributions regarding the causes of student academic performance problems and improvements, by experimentally assigned student profile (Cooperative vs. Uncooperative). Responses are measured on a 6-point scale ranging from 0 to 5, where higher values indicate stronger agreement. Columns (1) and (2) report the mean and standard deviation for the cooperative student profile, respectively. Columns (3) and (4) report the mean and standard deviation for the uncooperative student profile, respectively. Column (5) reports the difference in means, computed as uncooperative minus Cooperative. Column (6) reports p-values from Welch two-sample t-tests of equality of means. Column (7) reports p-values computed based on the Romano-Wolf step-down procedure using 5,000 bootstrap replications (see Clarke et al. 2020; Romano and Wolf 2005).

S3 Topic Extraction from Open-Ended Teacher Responses

To elicit teachers' perceived challenges in student management, the survey concluded with an open-ended question asking respondents to describe the primary issue that would concern them most when managing the student presented in the vignette: "What is the primary issue that would concern you most in managing this student?" Teachers' responses were analyzed using an unsupervised topic-modeling approach based on BERTopic, which combines multilingual sentence embeddings with density-based clustering to identify coherent themes in short textual responses. Each response is embedded using a pretrained multilingual transformer model optimized for semantic similarity across languages, which allows contextual meaning in Greek text to be captured without imposing ex ante topic definitions. The embeddings are then clustered using a hierarchical density-based algorithm that endogenously determines the number of topics and assigns semantically diffuse responses to an outlier category. Representative keywords for each topic are recovered using term frequency–inverse document frequency weights to facilitate interpretation and labeling.

In addition to assigning each response to a dominant topic, continuous measures of topic-intensity are constructed. For each topic, a centroid embedding is defined as the average embedding of responses assigned to that topic, and cosine similarity between each response and the topic centroid is used to measure semantic proximity. These scores allow responses to load on multiple topics with varying intensity. Topics are estimated on the pooled sample across experimental conditions to avoid post-treatment distortion, while topic intensities are analyzed by treatment arm.

Table S30 reports mean topic-intensity scores by assigned student profile. For comparatively uncooperative students, teachers place significantly greater emphasis on concerns related to *Underlying Causes of Student Behavior* and *Emotional State and Psychological Resilience*. The mean intensity of concerns about underlying behavioral causes is higher by 0.086 points relative to cooperative students ($p < 0.001$), and this difference remains significant after Romano–Wolf adjustment. Concerns related to emotional state and psychological resilience are also more salient for uncooperative students, with a difference of 0.053 points ($p = 0.002$; Romano–Wolf $p = 0.008$).

By contrast, teachers express significantly greater concern about *Adjustment to the New School Environment* for comparatively cooperative students. The intensity of this topic is lower for uncooperative students by 0.063 points ($p = 0.009$; Romano–Wolf $p = 0.035$), which indicates that adjustment-related concerns are less central when behavioral difficulties are salient. Differences across profiles are smaller and statistically not significant for perceptions related to *Student Motivation, Self-Confidence, and Engagement*, *Family Environment and Home Context*, and *Communication and Teacher–Student Cooperation*.

These patterns suggest that teachers interpret uncooperative behavior primarily through a diagnostic and psychological lens rather than as a transitory adjustment issue. When presented with an uncooperative student profile, teachers' concerns shift toward understanding the underlying causes of behavior and the student's emotional and psychological state, consistent with perceptions of deeper or more persistent challenges. By contrast, cooperative students are more often associated with concerns related to adaptation to a new school environment, consistent with the view that their difficulties are situational rather than behavioral in nature.

Notably, the absence of significant differences in concerns related to motivation, family background, and communication indicates that teachers do not uniformly attribute uncooperative behavior to deficits in effort or home support. Instead, uncooperativeness appears to activate concerns about internal states and behavioral mechanisms, which may affect subsequent expectations, interactions, and responses in the classroom.

Table S30: Topic Intensities in Teachers' Stated Concerns, by Student Profile

	Student Profile						
	Comparatively Cooperative		*Comparatively Uncooperative*				
	Mean	SD	Mean	SD	Diff.	P-value	Romano-Wolf P-value
Topic	(1)	(2)	(3)	(4)	(3) − (1)	(6)	(7)
Classroom Integration and Social Inclusion	0.545	0.138	0.575	0.136	0.030	0.086	0.282
Adjustment to the New School Environment	0.573	0.205	0.510	0.175	-0.063	0.009	0.035
Student Motivation, Self-Confidence, and Engagement	0.581	0.172	0.575	0.151	-0.006	0.756	0.758
Emotional State and Psychological Resilience	0.519	0.139	0.572	0.129	0.053	0.002	0.008
Family Environment and Home Context	0.461	0.154	0.490	0.151	0.029	0.129	0.331
Underlying Causes of Student Behavior	0.467	0.128	0.553	0.162	0.086	0.000	0.000
Communication and Teacher–Student Cooperation	0.432	0.108	0.453	0.128	0.020	0.172	0.331
N	127		127				

Notes: This table reports mean topic-intensity scores and standard deviations for teachers' open-ended responses describing their primary concern when managing a hypothetical student, by assigned student profile (comparatively cooperative vs. comparatively uncooperative). Topic intensities are derived using an unsupervised topic-modeling approach (BERTopic) applied to teachers' qualitative responses. For each identified topic, intensity is measured as the cosine similarity between a teacher's response embedding and the topic centroid, with higher values indicating greater semantic alignment with the topic. Columns (1) and (2) report the mean and standard deviation of topic-intensity scores for the cooperative student profile, while Columns (3) and (4) report the corresponding statistics for the uncooperative student profile. Column (5) reports the difference in means, computed as Uncooperative minus Cooperative. Column (6) presents p-values from Welch two-sample tests of equality of means. Column (7) reports p-values computed based on the Romano-Wolf step-down procedure using 5,000 bootstrap replications (see Clarke et al. 2020; Romano and Wolf 2005).

S4 An Assignment Model with Endogenous Effort and Repositioning

I adapt insights from assignment models of comparative advantage to an educational setting in which teachers allocate students to learning environments with heterogeneous growth potential under imperfect information (Sattinger, 1975, 1993). A central feature of these models is that observed outcomes reflect equilibrium assignment decisions rather than a direct technological mapping from individual characteristics to productivity. I extend this framework by incorporating endogenous student effort and identity-based responses to relative behavioral classification.

Students, Opportunities, and Growth. Consider a classroom with a finite set of students indexed by i and a finite set of learning opportunities indexed by j. Opportunities differ in growth potential (e.g., instructional intensity, autonomy, enrichment), indexed by κ_j. Each student is characterized by a latent noncognitive type θ_i. If assigned to opportunity j and exerting effort e_i, expected human capital growth is

$$a_{ij} = g(\theta_i, \kappa_j)\, e_i,$$

where $g(\cdot)$ is increasing in both arguments and effort is chosen by the student.

Information and Comparative Signals. Teachers do not observe θ_i directly. Instead, they observe a noisy behavioral index $s_i = \theta_i + \varepsilon_i$ and its ordinal rank within the classroom,

$$r_i = \text{rank}_k(s_k).$$

Because ranking is relative to classroom peers, it provides a socially salient signal of behavioral standing. Following assignment models, ordinal information is sufficient to order students by expected productivity across learning environments.

Task Assignment. Teachers choose an assignment to maximize expected aggregate growth:

$$\max_{\{i \to j\}} \sum_i \mathbb{E}[g(\theta_i, \kappa_j) e_i \mid r_i],$$

subject to capacity constraints. Under standard monotonicity conditions, higher-ranked students are assigned to opportunities with greater growth potential. As in linear-programming assignment models, observed differences in outcomes reflect equilibrium allocation rather than structural differences in learning technology.

Student Effort. Students choose effort after assignment. In the classroom environment, utility is

$$U_i^C = g(\theta_i, \kappa_j) e_i - c(e_i) - \psi(r_i),$$

where $c(\cdot)$ is convex and $\psi(r_i)$ captures identity or classification effects associated with relative behavioral standing. If lower relative rank reduces perceived returns to routine classroom investment or reinforces disengaged identity, then $\psi'(r_i) > 0$ for more disengaged ranks. Optimal effort satisfies

$$c'(e_i^C) = g(\theta_i, \kappa_j),$$

implying that assignment to lower-growth opportunities reduces marginal returns to effort and therefore equilibrium effort. Comparative disengagement thus depresses classroom performance through both assignment and effort channels.

Competitive Repositioning. Consider now a high-stakes environment (e.g., national exams for university admission). In this setting, performance depends directly on effort rather than teacher-mediated task allocation:

$$a_i^C = h(\theta_i)\, e_i^C.$$

Students choose effort to maximize

$$U_i^T = P(e_i^C)(R + \lambda(r_i) - c(e_i^C),$$

where R is the material return to success, $P(\cdot)$ is the probability of achieving a high rank, and $\lambda(r_i)$ captures the identity value of repositioning when prior classification is salient. $\lambda(r_i)$ is increasing in the salience of relative standing. Extreme relative standing increases the payoff to success by offering an opportunity to alter social rank.

The optimality condition implies

$$\frac{\partial e_i^C}{\partial (r_i)} > 0,$$

so students at more extreme behavioral ranks exert greater effort in competitive environments. Participation occurs when expected tournament utility exceeds outside options, which is more likely when routine classroom returns are low.

Implications. The model yields three central predictions. First, relative behavioral rank affects classroom outcomes through equilibrium assignment and endogenous effort, even conditional on absolute behavioral metrics. Second, effects are nonlinear and concentrated at the extremes of the rank distribution, where classification is most salient. Third, comparative disengagement may reduce routine classroom performance while increasing participation and effort in high-stakes, competitive environments, generating context-dependent returns to noncognitive skills standing.

S5 Questionnaire

S5.1 Baseline Teacher Characteristics

Q1. What is your gender?

- Man
- Woman
- Other
- Prefer not to answer

Q2. What is your year of birth?

(Dropdown selection: e.g., 2000)

Q3. What is the highest academic degree you hold?

- High school diploma or still studying in college
- Bachelor's degree from a Higher Educational Institution
- Master's degree from a Higher Educational Institution
- Doctorate from a Higher Educational Institution

Q4. Have you studied abroad?

- Yes
- No

Q5. What was your specialty upon first appointment?

(Dropdown selection: e.g., PE01)

Q6. To what extent do you agree with the following statement?

You can always significantly change how intelligent you are.

- **-5** means **Strongly Disagree**
- **+5** means **Strongly Agree**

(Response scale: -5 to +5 with slider)

S5.2 Randomization Blocks

S5.2.1 Cooperative Student Scenario

A new student is transferring into your class and will start next week. You receive the following informational profile from the student's previous school:

According to the teachers at the previous school, the student demonstrated academic performance and a number of absences (both excused and unexcused) close to the school average. **Compared with their classmates, the student was among the most consistent, compliant, and cooperative students in the class.**

Based on this information, please answer the questions that follow.

S5.2.2 Uncooperative Student Scenario

A new student is transferring into your class and will start next week. You receive the following informational profile from the student's previous school:

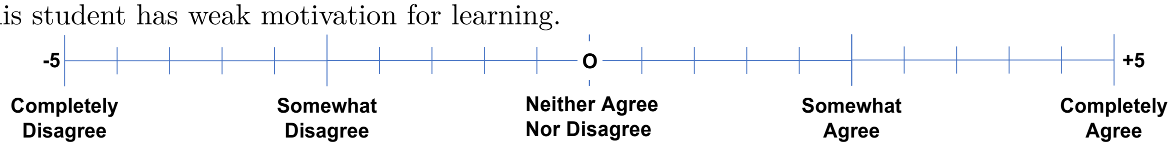
According to the teachers at the previous school, the student demonstrated academic performance and a number of absences (both excused and unexcused) close to the school average. **Compared with their classmates, the student was among the least consistent, compliant, and cooperative students in the class.**

Based on this information, please answer the questions that follow.

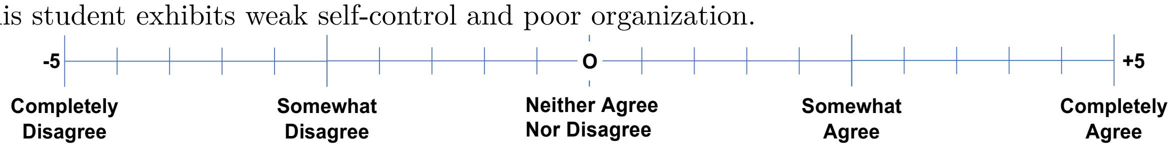
S5.3 Perceptions Questions

How much do you agree with the following statements?

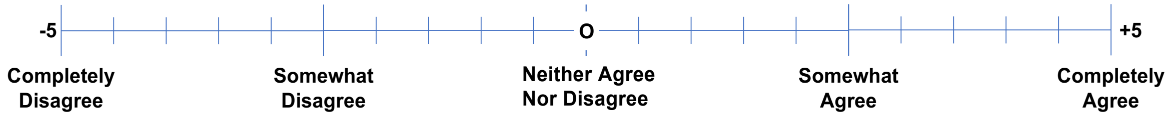
Q7. This student has weak motivation for learning.



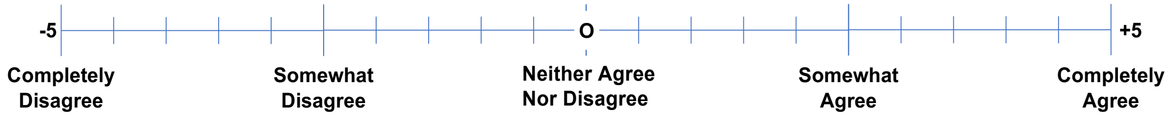
Q8. This student exhibits weak self-control and poor organization.



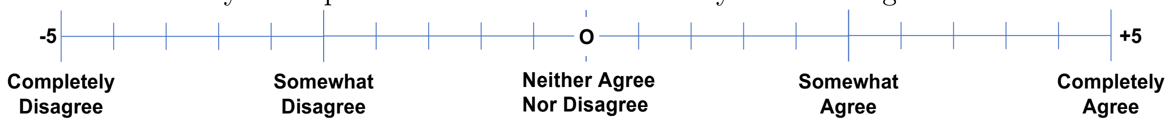
Q9. It is likely that the student will experience academic performance problems during the year.



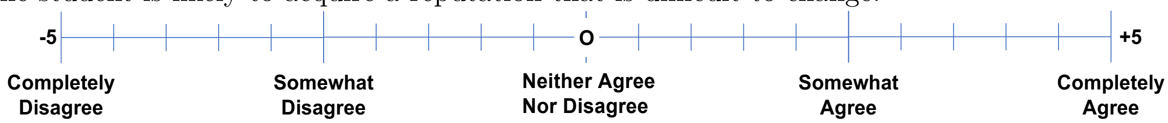
Q10. It is likely that the student will experience behavior and/or attendance problems during the year.



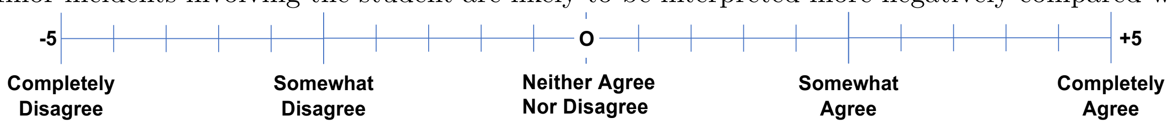
Q11. The student is likely to be perceived as a "bad student" by the teaching staff.



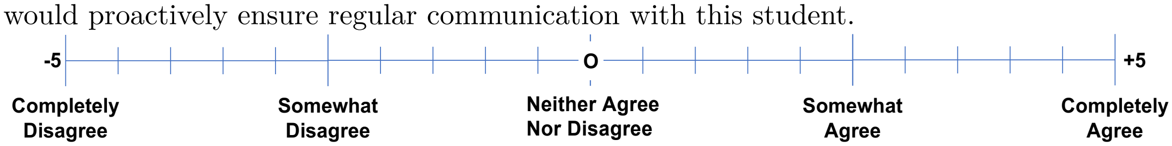
Q12. The student is likely to acquire a reputation that is difficult to change.



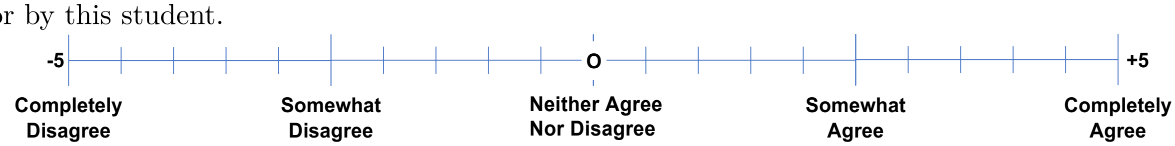
Q13. Minor incidents involving the student are likely to be interpreted more negatively compared with others.



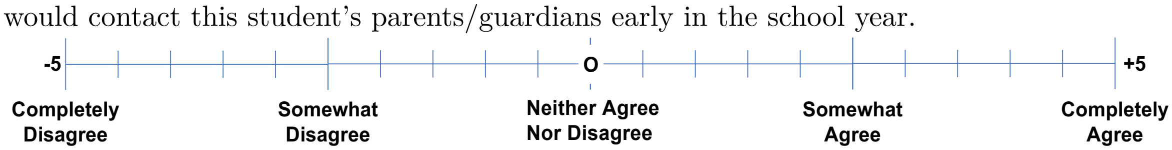
Q14. I would proactively ensure regular communication with this student.



Q15. I would be more likely to proceed with formal disciplinary action (suspension) in the case of disruptive behavior by this student.



Q16. I would contact this student's parents/guardians early in the school year.



Note: Questions 17-20 appeared in randomized order.

Q17. If this student's behavior and/or attendance worsens, it will be mainly due to:

Response scale: Not at all (0), A little (1), Moderately (2), Quite a bit (3), Very much (4), Extremely (5).

	0	1	2	3	4	5
The student's own effort or motivation	☐	☐	☐	☐	☐	☐
The student's self-regulation and organization	☐	☐	☐	☐	☐	☐
Teachers' instructional practices or classroom management	☐	☐	☐	☐	☐	☐
Relationships with classmates	☐	☐	☐	☐	☐	☐
Factors outside of school (e.g., family environment)	☐	☐	☐	☐	☐	☐

Q18. If this student's **behavior and/or attendance improves**, it will be mainly due to:

	0	1	2	3	4	5
The student's own effort or motivation	☐	☐	☐	☐	☐	☐
The student's self-regulation and organization	☐	☐	☐	☐	☐	☐
Teachers' instructional practices or classroom management	☐	☐	☐	☐	☐	☐
Relationships with classmates	☐	☐	☐	☐	☐	☐
Factors outside of school (e.g., family environment)	☐	☐	☐	☐	☐	☐

Q19. If this student's **academic performance worsens**, it will be mainly due to:

	0	1	2	3	4	5
The student's own effort or motivation	☐	☐	☐	☐	☐	☐
The student's self-regulation and organization	☐	☐	☐	☐	☐	☐
Teachers' instructional practices or classroom management	☐	☐	☐	☐	☐	☐
Relationships with classmates	☐	☐	☐	☐	☐	☐
Factors outside of school (e.g., family environment)	☐	☐	☐	☐	☐	☐

Q20. If this student's **academic performance improves**, it will be mainly due to:

	0	1	2	3	4	5
The student's own effort or motivation	☐	☐	☐	☐	☐	☐
The student's self-regulation and organization	☐	☐	☐	☐	☐	☐
Teachers' instructional practices or classroom management	☐	☐	☐	☐	☐	☐
Relationships with classmates	☐	☐	☐	☐	☐	☐
Factors outside of school (e.g., family environment)	☐	☐	☐	☐	☐	☐

Q21. What is the primary issue that would concern you most in managing this student?