Conduct and Consequences: Behavioral Rank and Educational Outcomes

Rigissa Megalokonomou
Monash University
IZA and CESifo

Tommaso Sartori
Monash University

Crete, 2026

Motivation

- Rank is a powerful organizing feature of social and economic life: ordinal position affects short and long-run outcomes by shaping effort, aspirations, and beliefs.
  - Students ranked higher in *academic ability* invest more in human capital, earn higher wages, choose more selective institutions—holding fixed absolute achievement (Murphy & Weinhardt, 2020; Denning et al., 2023; Elsner & Isphording, 2017).

Motivation

- Rank is a powerful organizing feature of social and economic life: ordinal position affects short and long-run outcomes by shaping effort, aspirations, and beliefs.
  - Students ranked higher in *academic ability* invest more in human capital, earn higher wages, choose more selective institutions—holding fixed absolute achievement (Murphy & Weinhardt, 2020; Denning et al., 2023; Elsner & Isphording, 2017).
- But students are not only ranked by grades: they are also ranked, informally but pervasively, by their **behavior**—who is "quiet," who is "difficult," who is "*the most disruptive in the room*."

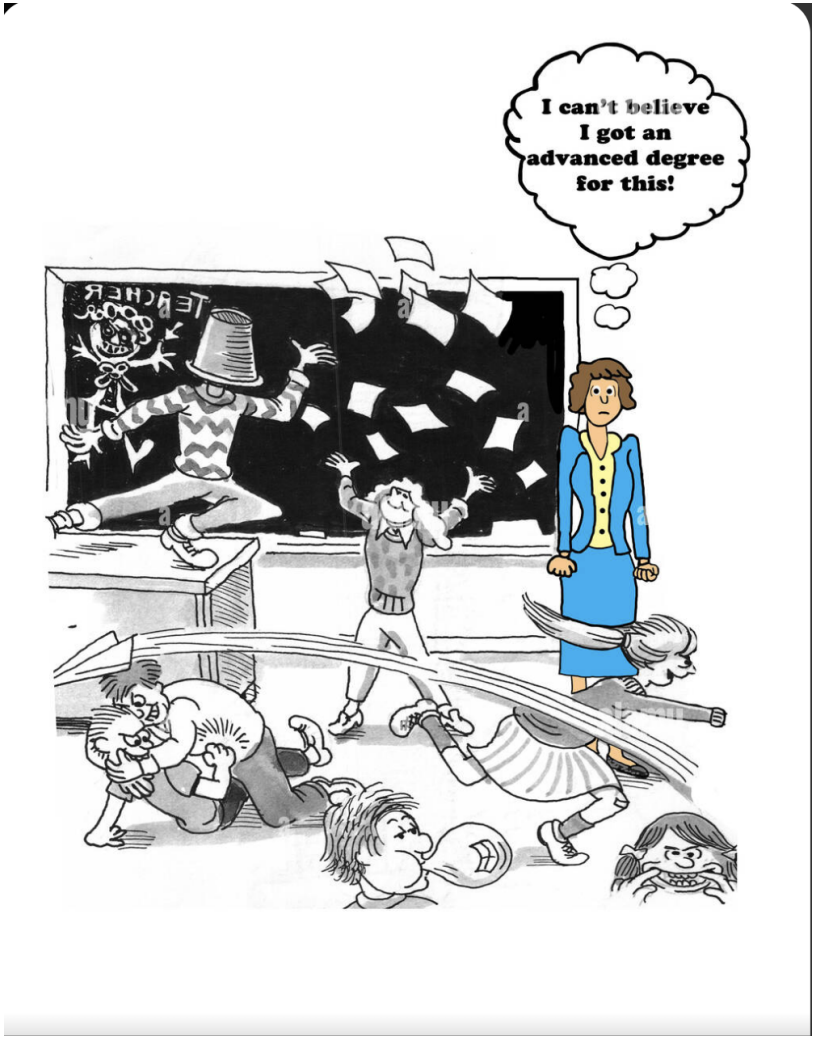
Motivation

- Rank is a powerful organizing feature of social and economic life: ordinal position affects short and long-run outcomes by shaping effort, aspirations, and beliefs.
  - Students ranked higher in *academic ability* invest more in human capital, earn higher wages, choose more selective institutions—holding fixed absolute achievement (Murphy & Weinhardt, 2020; Denning et al., 2023; Elsner & Isphording, 2017).
- But students are not only ranked by grades: they are also ranked, informally but pervasively, by their **behavior**—who is "quiet," who is "difficult," who is "*the most disruptive in the room*."
- **Why it matters?** Behavior is publicly visible, repeatedly reinforced, and socially consequential (Carrell et al., 2018; Segal, 2008; Goulas, Griselda, Megalokonomou & Zenou, 2024).

Motivation

- Rank is a powerful organizing feature of social and economic life: ordinal position affects short and long-run outcomes by shaping effort, aspirations, and beliefs.
  - Students ranked higher in *academic ability* invest more in human capital, earn higher wages, choose more selective institutions—holding fixed absolute achievement (Murphy & Weinhardt, 2020; Denning et al., 2023; Elsner & Isphording, 2017).
- But students are not only ranked by grades: they are also ranked, informally but pervasively, by their **behavior**—who is "quiet," who is "difficult," who is "*the most disruptive in the room*."
- **Why it matters?** Behavior is publicly visible, repeatedly reinforced, and socially consequential (Carrell et al., 2018; Segal, 2008; Goulas, Griselda, Megalokonomou & Zenou, 2024).
- Yet we know little about whether *relative behavioral standing* has persistent causal effects beyond a student's own conduct.
- We focus on a behavioral dimension: disruptiveness.

Motivation



This Paper

- **Question**: Are there persistent consequences of *relative* disruptive behavior, everything else equal?
- Two key empirical challenges:
  - **Observability** $\Rightarrow$ Student conduct is rarely recorded in administrative data
  - **Identification** $\Rightarrow$ Behavioral rank reflects both students' own behavior and the classrooms they are assigned to.

This Paper

- **Question**: Are there persistent consequences of *relative* disruptive behavior, everything else equal?
- Two key empirical challenges:
  - **Observability** $\Rightarrow$ Student conduct is rarely recorded in administrative data
  - **Identification** $\Rightarrow$ Behavioral rank reflects both students' own behavior and the classrooms they are assigned to.
- We overcome these challenges using administrative data from Greece:
  - **Observability** $\Rightarrow$ Hours of unexcused absences = disciplinary sanctions imposed by teachers, recorded at the student level in every classroom
  - **Identification** $\Rightarrow$ 1. Quasi-random assignment of students to classrooms (surname alphabetical order upon entry into grade 10) $\Rightarrow$ 2. Flexible controls for absolute disruptiveness, peer disruptiveness, and baseline ability

Why is Behavioral Rank Conceptually Distinct?

Prior Literature: Academic Rank

- **Private information:** Grades are often not shared with peers
- **Achievement-based:** Rank reflects academic performance
- Captures differences in **ability** and academic achievement
- Mechanism: **aspirations** and **self-belief**

This Paper: Behavioral Rank

- **Public information:** Disruptive behavior is visible to teachers and classmates
- **Behavior-based:** Rank reflects disruptive behavior
- Captures differences in **conduct** and **self-control**
- Potential mechanisms: **social identity** and **teacher beliefs**?

Teachers evaluate conduct comparatively, and an extreme position in the behavioral hierarchy may become a social identity that students internalize (Akerlof & Kranton, 2000).

Contributions

1. **Rank effects beyond cognitive achievement**: we extend the framework to ordinal position in student *conduct* (Murphy & Weinhardt 2020; Denning et al. 2023; Del Bono, Holford & Sartori 2025; Pagani et al. 2021; Megalokonomou & Zhang 2024).

Contributions

1. **Rank effects beyond cognitive achievement**: we extend the framework to ordinal position in student *conduct* (Murphy & Weinhardt 2020; Denning et al. 2023; Del Bono, Holford & Sartori 2025; Pagani et al. 2021; Megalokonomou & Zhang 2024).
2. **Disruptive peers and learning**: even holding constant classroom composition, ordinal position within the behavioral distribution matters independently (Carrell, Hoekstra & Kuka 2018; Goulas, Griselda, Megalokonomou & Zenou 2024).

Contributions

1. **Rank effects beyond cognitive achievement**: we extend the framework to ordinal position in student *conduct* (Murphy & Weinhardt 2020; Denning et al. 2023; Del Bono, Holford & Sartori 2025; Pagani et al. 2021; Megalokonomou & Zhang 2024).
2. **Disruptive peers and learning**: even holding constant classroom composition, ordinal position within the behavioral distribution matters independently (Carrell, Hoekstra & Kuka 2018; Goulas, Griselda, Megalokonomou & Zenou 2024).
3. **Skill formation in adolescence**: behavioral dispositions remain responsive to social environments well beyond early childhood (Heckman 2006; Heckman & Kautz 2012; Sorrenti et al. 2024).

Contributions

1. **Rank effects beyond cognitive achievement**: we extend the framework to ordinal position in student *conduct* (Murphy & Weinhardt 2020; Denning et al. 2023; Del Bono, Holford & Sartori 2025; Pagani et al. 2021; Megalokonomou & Zhang 2024).
2. **Disruptive peers and learning**: even holding constant classroom composition, ordinal position within the behavioral distribution matters independently (Carrell, Hoekstra & Kuka 2018; Goulas, Griselda, Megalokonomou & Zenou 2024).
3. **Skill formation in adolescence**: behavioral dispositions remain responsive to social environments well beyond early childhood (Heckman 2006; Heckman & Kautz 2012; Sorrenti et al. 2024).
4. **Mechanism—teacher expectations**: a two-stage online experiment shows teachers use *relative* behavioral information as a signal of underlying ability and potential (Papageorge, Gershenson & Kang 2020; Bursztyn, González & Yanagizawa-Drott 2020).

Outline

Introduction

Institutional Setting and Data
- Institutional Setting
- Data

Measuring Disruptiveness and Rank
- Measure

Methodology and Estimation Framework

Results

Mechanism: Teacher Survey Experiment

Conclusion

Institutional Setting

- Highly centralized public system: >90% of students in public schools, assigned by residential zoning (OECD, 2018) $\Rightarrow$ no school choice conditional on residence.
- Grade 10 pools students from *multiple feeder schools* $\Rightarrow$ classmates are mostly unfamiliar and behavioral reputations are formed anew.
- **Students are assigned to classrooms by alphabetical order of surnames** and remain with the same classmates throughout Grade 10 $\Rightarrow$ prolonged exposure to a fixed reference group.
- Teachers are also quasi-randomly assigned to classes in this context (Lavy & Megalokonomou, 2024).

Institutional Setting

- Highly centralized public system: >90% of students in public schools, assigned by residential zoning (OECD, 2018) $\Rightarrow$ no school choice conditional on residence.
- Grade 10 pools students from *multiple feeder schools* $\Rightarrow$ classmates are mostly unfamiliar and behavioral reputations are formed anew.
- **Students are assigned to classrooms by alphabetical order of surnames** and remain with the same classmates throughout Grade 10 $\Rightarrow$ prolonged exposure to a fixed reference group.
- Teachers are also quasi-randomly assigned to classes in this context (Lavy & Megalokonomou, 2024).

Data

- High School Administrative Records
  - $\Rightarrow$ Administrative records for 10 representative public high schools across Greece ($\approx$6,000 students), 2003–2011.
  - $\Rightarrow$ Student-level information on demographics, classroom assignment, attendance (excused and unexcused absences), transcripts, and term-by-term enrolment (Grades 10–12).
  - $\Rightarrow$ Attendance and transcript records from the final semester of Grade 9 for all classmates $\Rightarrow$ pre-assignment measures
- Hellenic Ministry of Education
  - $\Rightarrow$ National examination scores, university admission scores, higher education enrolment, institution attended, degree programme, academic degree completion, and university quality.
- Ministry of Economy and Finance
  - $\Rightarrow$ Postcode-level household income around sampled schools
- Analysis Sample
  - $\Rightarrow$ 5,923 students with pre-determined measures observed
  - $\Rightarrow$ Behavioral rank constructed using grade 9 unexcused absence hours relative to classmates.

Outline

Introduction

Institutional Setting and Data
- Institutional Setting
- Data

Measuring Disruptiveness and Rank
- Measure

Methodology and Estimation Framework

Results

Mechanism: Teacher Survey Experiment

Conclusion

Proxy for Student Disruptiveness

- Attendance records distinguish between:
  - **Unexcused absence hours**: disciplinary sanctions imposed by a teacher/principal in response to a rule violation $\Rightarrow$ temporary removal from the classroom.
  - **Excused absences**: illness or family emergencies, formally authorized.

Proxy for Student Disruptiveness

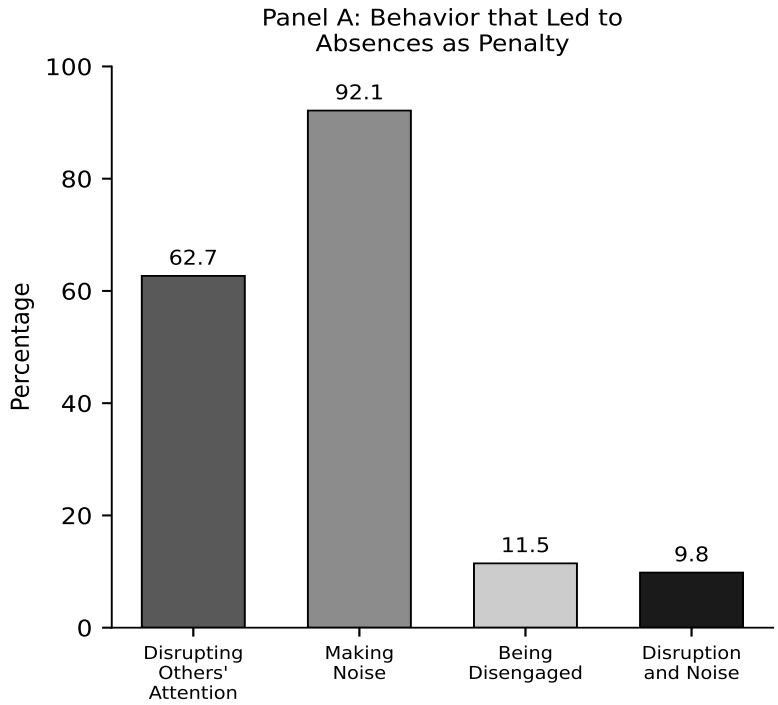
- Attendance records distinguish between:
  - **Unexcused absence hours**: disciplinary sanctions imposed by a teacher/principal in response to a rule violation $\Rightarrow$ temporary removal from the classroom.
  - **Excused absences**: illness or family emergencies, formally authorized.
- Sanctions reflect *observable misconduct*—disruption, violence, bullying, truancy—that undermines the learning environment.
  - Recorded at the class-period level; maximum of 50 unexcused hours per year (beyond that, grade repetition).
  - Class periods are spread across the weekly schedule $\Rightarrow$ students cannot selectively avoid subjects.

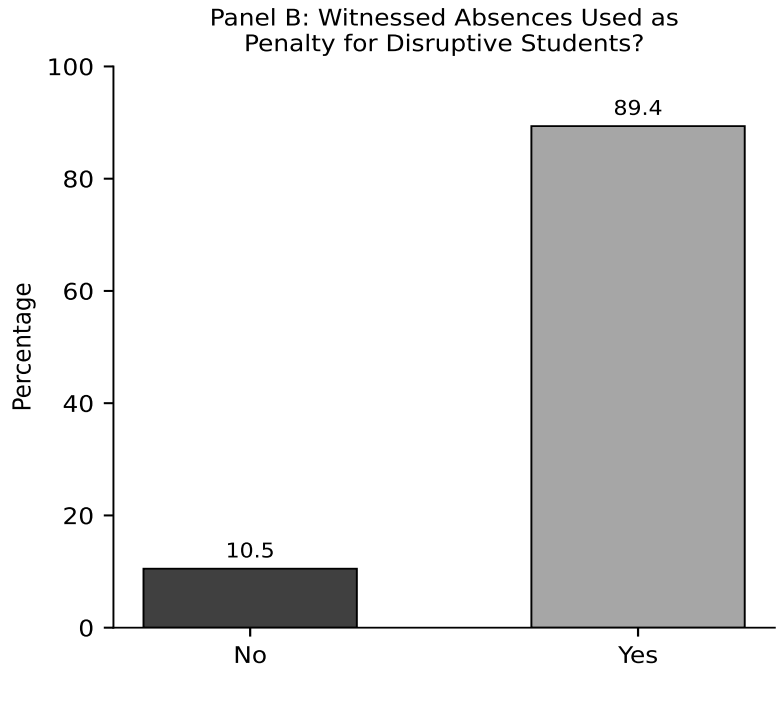
Proxy for Student Disruptiveness

- Attendance records distinguish between:
  - **Unexcused absence hours**: disciplinary sanctions imposed by a teacher/principal in response to a rule violation $\Rightarrow$ temporary removal from the classroom.
  - **Excused absences**: illness or family emergencies, formally authorized.
- Sanctions reflect *observable misconduct*—disruption, violence, bullying, truancy—that undermines the learning environment.
  - Recorded at the class-period level; maximum of 50 unexcused hours per year (beyond that, grade repetition).
  - Class periods are spread across the weekly schedule $\Rightarrow$ students cannot selectively avoid subjects.
- Therefore, suspension hours are a reliable and standardized measure of classroom disruptiveness, tied to behavior rather than strategic absenteeism.

Validation 1: Unexcused Absences Capture Disruption

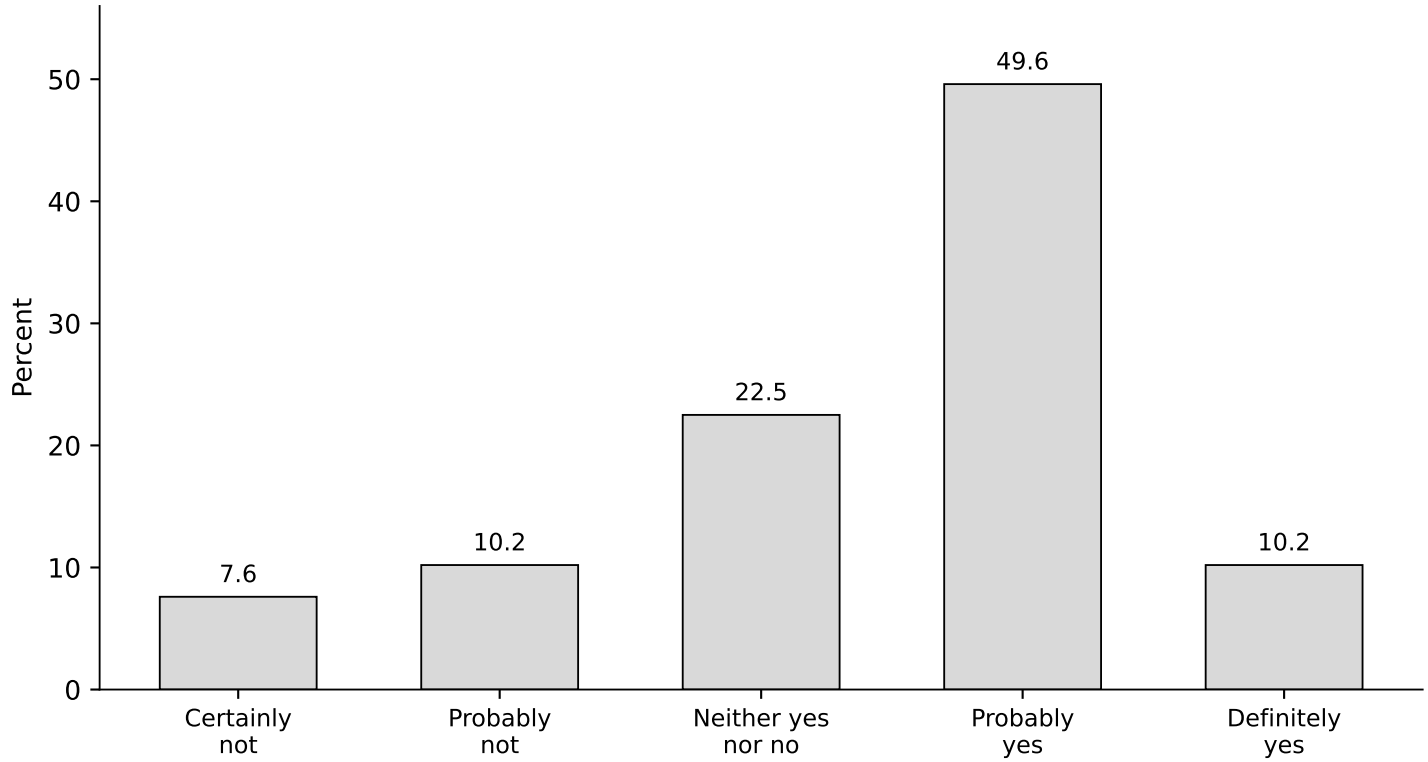
- 2022 lab-in-the-field experiment in six public high schools (Goulas, Griselda, Megalokonomou & Zenou, 2024): **89%** report witnessing teachers issue hourly unexcused absences as a sanction for disruptive peers.
- Triggering behaviors: making noise (92%), disrupting classmates' attention (63%), disengagement (only 11%) $\Rightarrow$ negative externalities for peers.





Validation 2: Absences Are Used as a Disciplinary Tool,

2026 online teacher survey (Megalokonomou & Sartori, 2026)

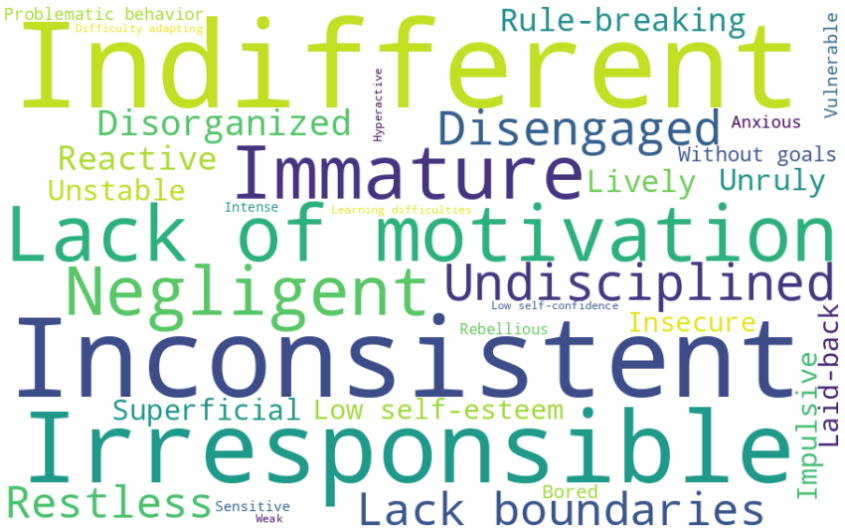


Responses of 761 in-service teachers to the statement "Unexcused absences are used by teachers as a disciplinary tool for managing student behavior" (five-point Likert scale). 60% answer "probably" or "definitely" yes; only 18% reject the interpretation.

Validation 3: How Teachers Characterize Students by Absences

2026 online teacher survey (Megalokonomou & Sartori, 2026)

Panel A: Students with More Absences



Panel B: Students with Fewer Absences

Source: Our online survey of 761 in-service teachers (design presented later).
Question asked: "In two words, how would you describe the personality of students who, compared with their classmates, have among the *highest* (*lowest*) levels of unexcused absences?"

Measuring Classroom Rank

- Baseline disruptiveness: hours of unexcused absences in the **final semester of Grade 9** (pre-determined w.r.t. grade 10 interactions).
- Students are ranked *relative to their grade 10 classmates*, after the classroom reshuffling upon entry into upper secondary education.

Measuring Classroom Rank

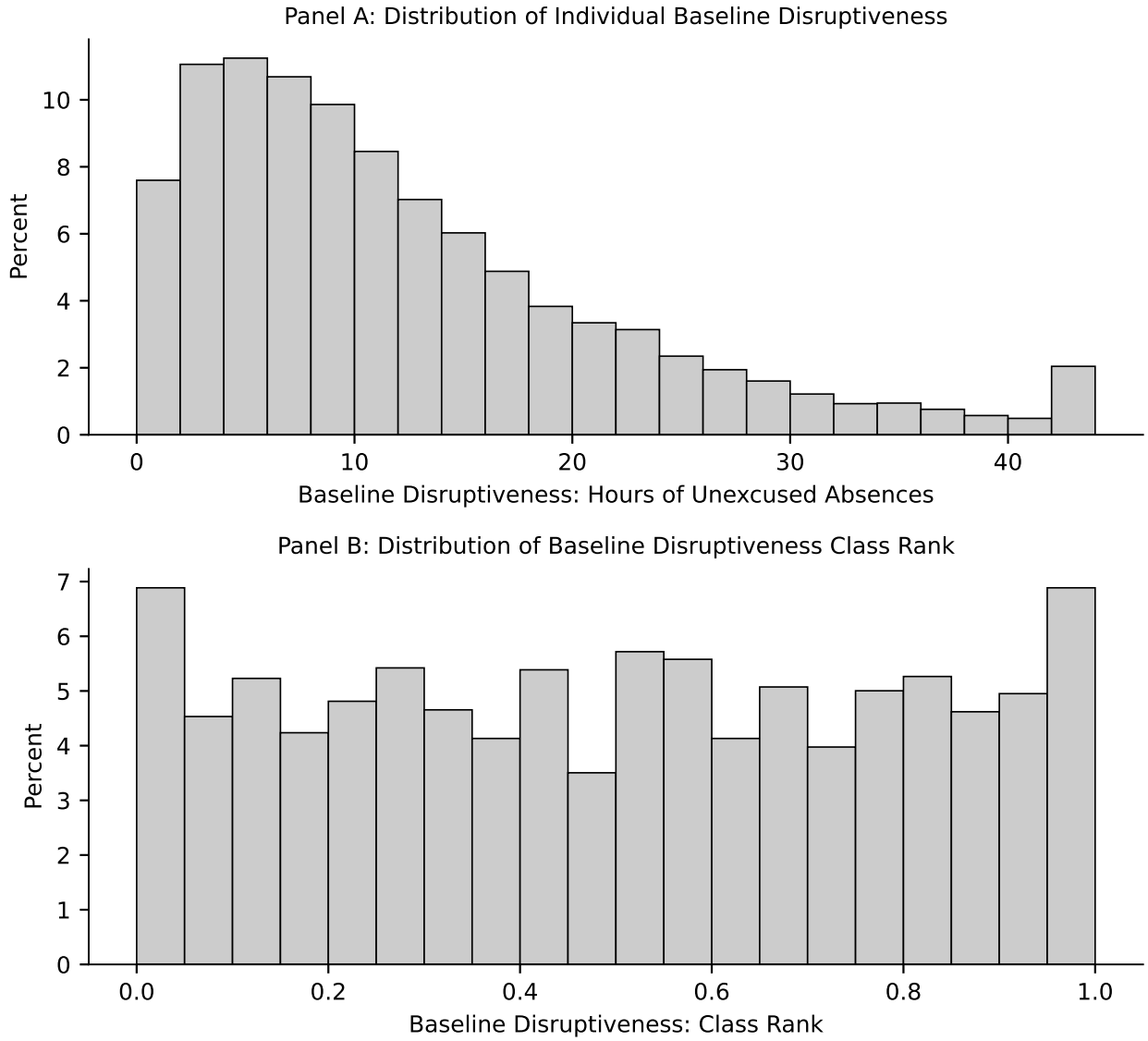
- Baseline disruptiveness: hours of unexcused absences in the **final semester of Grade 9** (pre-determined w.r.t. grade 10 interactions).
- Students are ranked *relative to their grade 10 classmates*, after the classroom reshuffling upon entry into upper secondary education.

Percentilized rank (Murphy & Weinhardt, 2020):

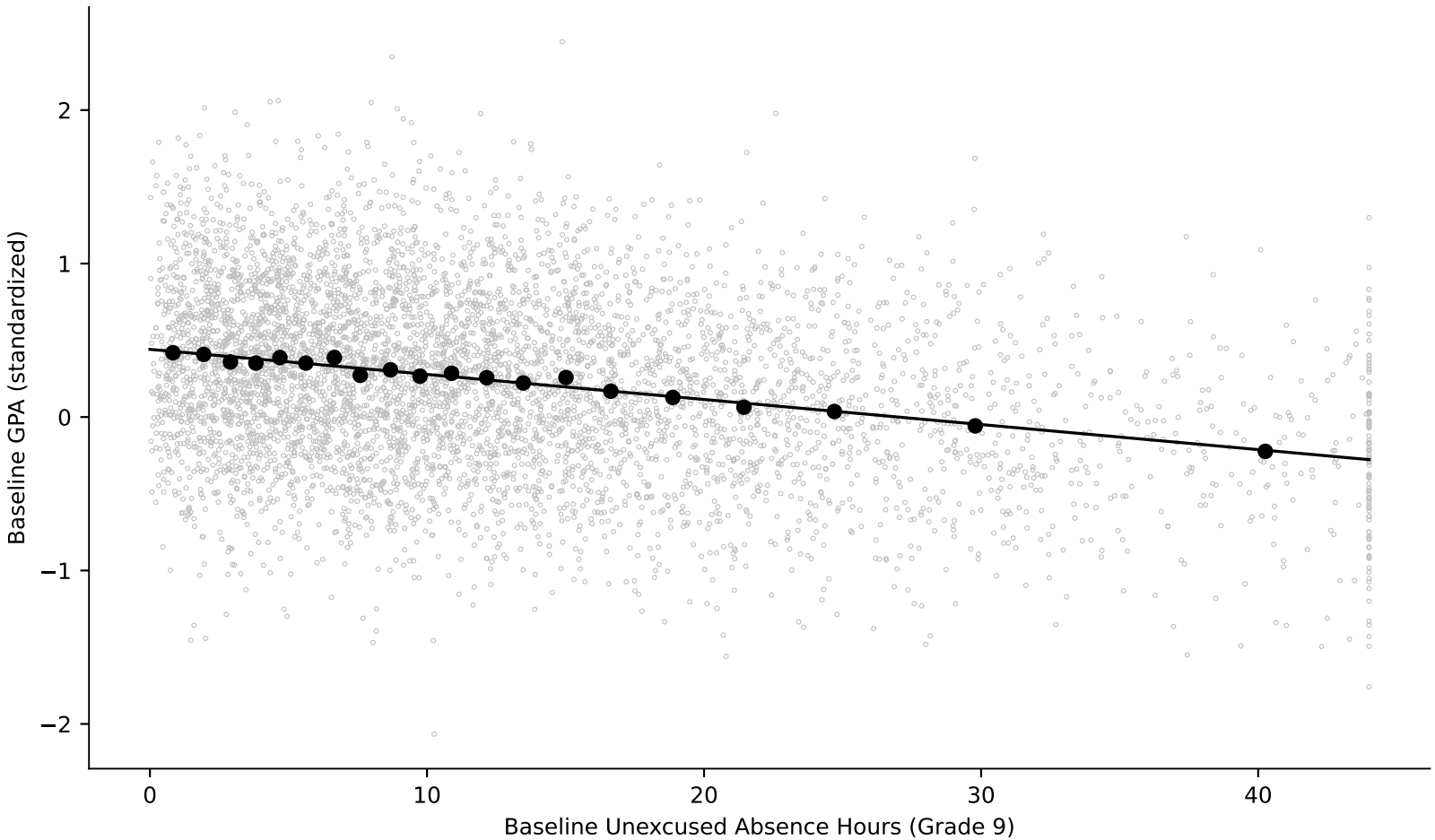
$$R^{D}_{icsy} = \frac{n_{icsy} - 1}{N_{csy} - 1} \tag{1}$$

- n_{icsy}: ordinal disruptiveness rank of student i in classroom c, school s, year y; N_{csy}: class size.
- Bounded between 0 (least disruptive) and 1 (most disruptive); comparable across classes of different sizes.
- Ties are assigned the mean rank across tied observations.

Baseline Disruptiveness and its Class Rank



Descriptive Evidence: Disruptiveness and GPA



Strongly negative relationship between baseline disruptiveness and baseline GPA—but the substantial dispersion around the trend is the source of identifying variation when both ranks are controlled for.

Summary Statistics

	Mean	SD	Min	Max	N
Baseline Measures					
Baseline GPA (0–20)	13.60	2.90	8	20	5,923
Baseline Unexcused Absences	12.82	10.25	0	44	5,923
Number of Classmates (Grade 10)	23.00	3.63	13	31	5,923
Rank in Baseline Disruptiveness	0.49	0.30	0	1	5,923
High School Outcomes					
Unexcused Absences (Grade 10)	25.86	14.01	0	52	5,848
Unexcused Absences (Grade 11)	31.23	13.37	0	60	4,861
Unexcused Absences (Grade 12)	36.72	11.93	0	62	4,389
Final Exam GPA (Grade 10)	−0.55	0.94	−4	2	5,923
Final Exam GPA (Grade 12)	−0.80	0.86	−4	1	4,394
End of High School Outcomes					
National Exams Score	12.49	4.04	3	20	3,536
University Admissions Score	13,902	3,505	2,468	22,701	2,754
Quality of the Admitted Degree	45.23	25.82	0	100	2,750
Selected Shares (%)					
Female	55				5,923
Completed High School on Time	95				5,923
Enrolled in Academic Degree	78				3,536
Admitted to Tertiary Education	56				2,754
Applied to STEM Major	59				3,536

Notes: Baseline measures are observed prior to classroom assignment in Grade 10. GPA is the average of final exam scores in Language, Mathematics, Physics, and History. The national exam score refers to the centralized high school exit examinations; the university admission score is the composite used for tertiary placement. Sample sizes vary across variables due to data availability.

Outline

Introduction

Institutional Setting and Data
- Institutional Setting
- Data

Measuring Disruptiveness and Rank
- Measure

Methodology and Estimation Framework

Results

Mechanism: Teacher Survey Experiment

Conclusion

Conceptual Framework

We incorporate ordinal rank in the *behavioral* domain into an education production framework (in the spirit of Murphy & Weinhardt, 2020):

$$Y_{i1} = g\left(B_{i0},\, X_i,\, R_{ic}^{D},\, \eta_i,\, \nu_s\right) + \varepsilon_{i1}$$

- B_{i0}: baseline disruptive behavior (Grade 9 suspension hours)
- R_{ic}^{D}: within-class percentile disruptiveness rank—an *additional input* capturing features of the environment not summarized by B_{i0} alone
- Because classrooms are small and students differ in baseline disruptiveness, otherwise identical students (same B_{i0}, X_i) can occupy different positions depending only on peer composition

Conceptual Framework

We incorporate ordinal rank in the *behavioral* domain into an education production framework (in the spirit of Murphy & Weinhardt, 2020):

$$Y_{i1} = g\left(B_{i0},\, X_i,\, R_{ic}^{D},\, \eta_i,\, \nu_s\right) + \varepsilon_{i1}$$

- B_{i0}: baseline disruptive behavior (Grade 9 suspension hours)
- R_{ic}^{D}: within-class percentile disruptiveness rank—an *additional input* capturing features of the environment not summarized by B_{i0} alone
- Because classrooms are small and students differ in baseline disruptiveness, otherwise identical students (same B_{i0}, X_i) can occupy different positions depending only on peer composition

Hypothesis: conditional on absolute behavior, H_0: $\beta_{rank} = 0$ vs. H_1: $\beta_{rank} < 0$, for outcomes coded so that higher = better.

Conceptual Framework

We incorporate ordinal rank in the *behavioral* domain into an education production framework (in the spirit of Murphy & Weinhardt, 2020):

$$Y_{i1} = g\left(B_{i0},\, X_i,\, R^D_{ic},\, \eta_i,\, \nu_s\right) + \varepsilon_{i1}$$

- B_{i0}: baseline disruptive behavior (Grade 9 suspension hours)
- R^D_{ic}: within-class percentile disruptiveness rank—an *additional input* capturing features of the environment not summarized by B_{i0} alone
- Because classrooms are small and students differ in baseline disruptiveness, otherwise identical students (same B_{i0}, X_i) can occupy different positions depending only on peer composition

Hypothesis: conditional on absolute behavior, H_0: $\beta_{rank} = 0$ vs. H_1: $\beta_{rank} < 0$, for outcomes coded so that higher = better.

The framework maps directly into our estimating equation:

$$Y_{icsy} = \beta R^D_{icsy} + \mathbf{1}\{Q^D_{icsy}\} + \mathbf{1}\{Q^{\bar{D}}_{csy}\} + \mathbf{1}\{Q^{GPA}_{icsy}\} + \lambda_{sy} + X_i + \varepsilon_{icsy}$$

Empirical Specification

$$Y_{icsy} = \beta R^{D}_{icsy} + \mathbf{1}\{Q^{D}_{icsy}\} + \mathbf{1}\{Q^{\bar{D}}_{csy}\} + \mathbf{1}\{Q^{GPA}_{icsy}\} + \lambda_{sy} + X_i + \varepsilon_{icsy} \qquad (2)$$

- R^{D}_{icsy}: rank in baseline disruptiveness of student i, classroom c, school s, year y
- $\mathbf{1}\{Q^{D}_{icsy}\}$, $\mathbf{1}\{Q^{\bar{D}}_{csy}\}$, $\mathbf{1}\{Q^{GPA}_{icsy}\}$: quintile indicators for individual baseline disruptiveness, leave-one-out classroom disruptiveness, and baseline GPA $\Rightarrow$ absorb nonlinearities without exhausting within-cell variation in rank
- λ_{sy}: school-by-cohort fixed effects; X_i: gender, born in first quarter, excused absences, class size; SEs clustered at the classroom level

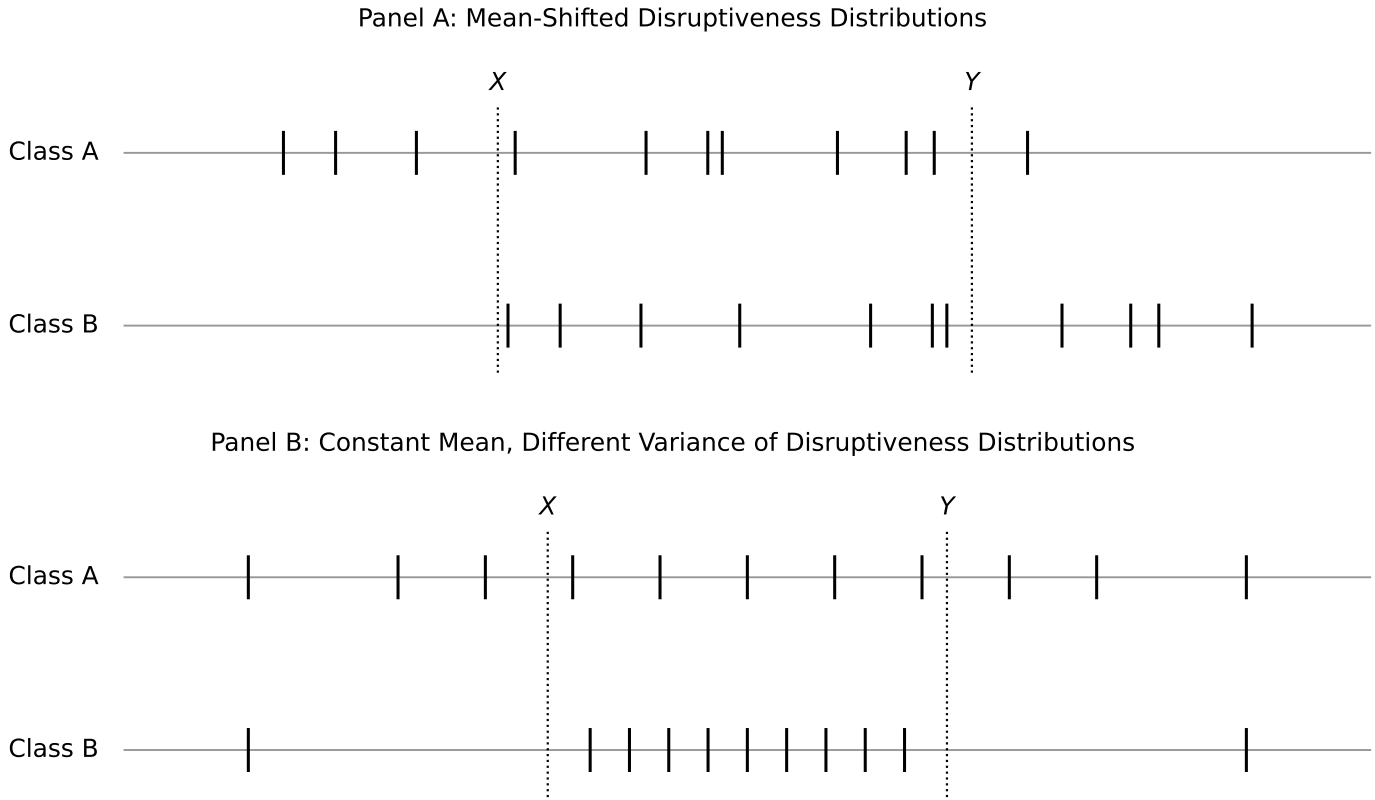
Empirical Specification

$$Y_{icsy} = \beta R^{D}_{icsy} + \mathbf{1}\{Q^{D}_{icsy}\} + \mathbf{1}\{Q^{\bar{D}}_{csy}\} + \mathbf{1}\{Q^{GPA}_{icsy}\} + \lambda_{sy} + X_i + \varepsilon_{icsy} \qquad (2)$$

- R^{D}_{icsy}: rank in baseline disruptiveness of student i, classroom c, school s, year y
- $\mathbf{1}\{Q^{D}_{icsy}\}$, $\mathbf{1}\{Q^{\bar{D}}_{csy}\}$, $\mathbf{1}\{Q^{GPA}_{icsy}\}$: quintile indicators for individual baseline disruptiveness, leave-one-out classroom disruptiveness, and baseline GPA $\Rightarrow$ absorb nonlinearities without exhausting within-cell variation in rank
- λ_{sy}: school-by-cohort fixed effects; X_i: gender, born in first quarter, excused absences, class size; SEs clustered at the classroom level
- **Parameter of interest**: β = effect of moving up the within-classroom disruptiveness ranking, *holding constant* absolute disruptiveness, academic ability, and peer composition

Identifying Variation in Behavioral Rank

- Randomly assigning *identical* students to classrooms would generate *no* rank variation at all. Identification instead compares students with *similar* baseline disruptiveness who occupy *different* ranks only because their classmates differ.



Substantial residual variation remains after absorbing school-by-cohort fixed effects.

Within-School Variation

Evidence on Quasi-Random Assignment of Students

- Students are quasi-randomly assigned to classrooms by surname alphabetical order upon grade 10 entry $\Rightarrow$ we expect no sorting on student characteristics.
  - Rule set out in Government Gazette 167 A/1566/1985; uniformly enforced (99.83% compliance in schools where surnames were available in a different sample)
  - Random assignment validated in prior work using the same context (e.g. Goulas, Griselda & Megalokonomou 2021, 2022, 2024; Dinerstein, Megalokonomou & Yannelis 2022; Kedagni, Krishna, Megalokonomou & Zhao 2021).
- Teachers are *also* quasi-randomly assigned to classrooms in this context (Lavy & Megalokonomou 2024a, 2024b); no teacher information in the current sample.
- Balancing: rank in baseline disruptiveness and classroom disruptiveness moments are unrelated to gender, birth quarter, excused absences, and optional course choices

Balancing Test: Student Level

	Female Student	Born in 1st Quarter	Optional: Arts	# of Excused Absences
	(1)	(2)	(3)	(4)
Panel A				
Rank in Baseline Disruptiveness	0.093	−0.037	0.054	0.171
	(0.082)	(0.040)	(0.044)	(0.159)
Panel B				
Mean of Baseline Disruptiveness	−0.005	0.000	−0.001	−0.003
	(0.003)	(0.001)	(0.003)	(0.005)
SD of Baseline Disruptiveness	0.000	−0.002	0.005	−0.005
	(0.006)	(0.002)	(0.005)	(0.010)
Median of Baseline Disruptiveness	−0.001	0.000	−0.001	−0.001
	(0.003)	(0.001)	(0.003)	(0.004)
Observations	5,923	5,923	5,481	5,873
School-Cohort FE	✓	✓	✓	✓
Baseline Controls	✓	✓	✓	✓

Notes: Panel A presents estimates from separate student-level regressions of each pre-determined characteristic on baseline disruptiveness rank, conditional on quintiles of individual and classroom disruptiveness and baseline GPA, and school-cohort fixed effects. Panel B relates predetermined characteristics to moments of the classroom-level baseline disruptiveness distribution (mean, SD, median). Standard errors clustered at the classroom level in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Balancing Test: Classroom Level

	Female	Born in 1st Quarter	Optional: Arts	# of Excused Absences	# of Unexcused Absences	GPA
	(1)	(2)	(3)	(4)	(5)	(6)
Class 2	−0.040*	−0.004	0.016	−0.019	0.071	−0.066
	(0.024)	(0.009)	(0.029)	(0.024)	(0.048)	(0.042)
Class 3	−0.015	−0.002	−0.033	−0.023	0.009	−0.089*
	(0.029)	(0.009)	(0.029)	(0.032)	(0.053)	(0.048)
Class 4	0.022	0.000	−0.028	−0.017	0.034	−0.075
	(0.039)	(0.012)	(0.036)	(0.039)	(0.067)	(0.055)
Observations	260	260	250	260	260	260
P-value for joint significance	0.24	1.00	0.79	0.08	0.39	0.28
School × Cohort FE	✓	✓	✓	✓	✓	✓

Notes: The table presents estimated coefficients of binary indicators for class numbers on classroom-level averages of predetermined characteristics (higher class indicators omitted for space). Class 1 is the omitted reference category. P-values from joint tests of significance across classroom indicators suggest class numbers are not associated with differences in class-level averages. Standard errors clustered at the classroom level in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Outline

Introduction

Institutional Setting and Data
- Institutional Setting
- Data

Measuring Disruptiveness and Rank
- Measure

Methodology and Estimation Framework

Results

Mechanism: Teacher Survey Experiment

Conclusion

Rank Effect on Disruptiveness and Academic Performance

	Grade 10		Grade 11		Grade 12	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Hours of Unexcused Absences						
Rank in Baseline Disruptiveness	17.035***	16.656***	13.189***	12.414***	7.878***	7.494***
	(1.425)	(1.424)	(1.810)	(1.763)	(1.986)	(1.980)
Baseline Mean	25.86	25.86	31.23	31.23	36.72	36.72
Observations	5,848	5,848	4,861	4,861	4,389	4,389
Panel B: Standardized GPA						
Rank in Baseline Disruptiveness	−0.593***	−0.215**	−0.535***	−0.266***	−0.512***	−0.184*
	(0.146)	(0.089)	(0.160)	(0.093)	(0.162)	(0.101)
Baseline Mean	−0.58	−0.58	−0.63	−0.63	−0.81	−0.81
Observations	5,923	5,923	4,863	4,863	4,394	4,394
School-Cohort FE	✓	✓	✓	✓	✓	✓
Baseline & Peer Disruptiveness	✓	✓	✓	✓	✓	✓
Controls & Baseline GPA		✓		✓		✓

Notes: Effect of baseline disruptiveness rank on hours of unexcused absences (Panel A) and standardized GPA (Panel B) at the end of Grades 10–12. Rank is constructed from Grade 9 (last semester) unexcused absence hours, relative to Grade 10 classmates. Odd columns: quintiles of individual and peer disruptiveness and school-cohort FE; even columns add individual controls and baseline GPA quintiles. SEs clustered at the classroom level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Rank Effect on Disruptiveness and Academic Performance

	Grade 10		Grade 11		Grade 12	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Hours of Unexcused Absences						
Rank in Baseline Disruptiveness	17.035***	16.656***	13.189***	12.414***	7.878***	7.494***
	(1.425)	(1.424)	(1.810)	(1.763)	(1.986)	(1.980)
Baseline Mean	25.86	25.86	31.23	31.23	36.72	36.72
Observations	5,848	5,848	4,861	4,861	4,389	4,389
Panel B: Standardized GPA						
Rank in Baseline Disruptiveness	−0.593***	−0.215**	−0.535***	−0.266***	−0.512***	−0.184*
	(0.146)	(0.089)	(0.160)	(0.093)	(0.162)	(0.101)
Baseline Mean	−0.58	−0.58	−0.63	−0.63	−0.81	−0.81
Observations	5,923	5,923	4,863	4,863	4,394	4,394
School-Cohort FE	✓	✓	✓	✓	✓	✓
Baseline & Peer Disruptiveness	✓	✓	✓	✓	✓	✓
Controls & Baseline GPA		✓		✓		✓

Notes: Effect of baseline disruptiveness rank on hours of unexcused absences (Panel A) and standardized GPA (Panel B) at the end of Grades 10–12. Rank is constructed from Grade 9 (last semester) unexcused absence hours, relative to Grade 10 classmates. Odd columns: quintiles of individual and peer disruptiveness and school-cohort FE; even columns add individual controls and baseline GPA quintiles. SEs clustered at the classroom level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

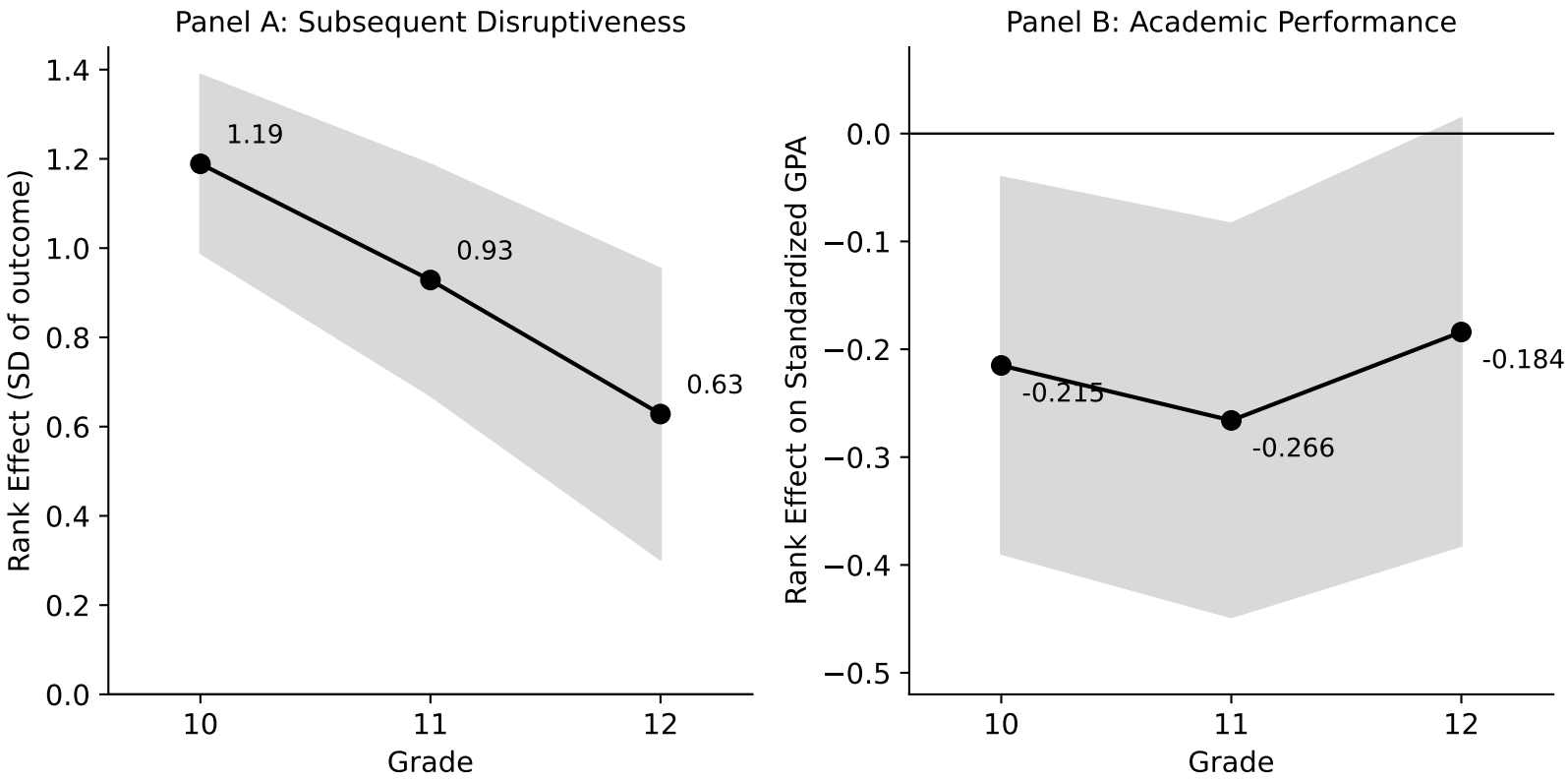
$\Rightarrow$ Disruptiveness: bottom-to-top move $= +16.7$ hours ($= 1.19$ SD); two positions up ($\approx$10%) $\Rightarrow +1.7$ hours.

$\Rightarrow$ GPA: bottom-to-top move $= -0.22$ SD in Grade 10; two positions up ($\approx$10%) $\Rightarrow -0.02$ SD

$\Rightarrow$ Comparable to replacing a highly effective teacher with a substantially less effective one (Chetty et al., 2014), or increasing class size by about seven students (Krueger, 1999).

Nonlinearities

Rank Effects Persist but Attenuate Across Grades



Persistence across grades—in classrooms where neither teachers nor peers observe students' prior rank—points to rank-based identity formation rather than direct social reinforcement.

Rank Effect on Long-Term Outcomes

Panel A: High School Outcomes						
	Graduating on Time		National Exam Score		Univ. Admission Score	
	(1)	(2)	(3)	(4)	(5)	(6)
Rank in Baseline Disruptiveness	−0.144***	−0.108***	−0.558***	−0.333**	−0.622***	−0.440**
	(0.028)	(0.027)	(0.196)	(0.138)	(0.191)	(0.176)
Baseline Mean	0.95	0.95	0.00	0.00	0.00	0.00
Observations	5,923	5,923	3,536	3,536	2,750	2,750
Panel B: Higher Education Outcomes						
	Admitted to Tertiary Ed.		Enrolled Academic Degree		Quality of Institution	
Rank in Baseline Disruptiveness	−0.071	−0.006	−0.393***	−0.310***	−17.193***	−13.892***
	(0.079)	(0.062)	(0.105)	(0.099)	(5.447)	(5.322)
Baseline Mean	0.78	0.78	0.56	0.56	45.23	45.23
Observations	3,536	3,536	2,750	2,750	2,750	2,750
School-Cohort FE	✓	✓	✓	✓	✓	✓
Baseline & Peer Disr., Controls	✓	✓	✓	✓	✓	✓
Baseline GPA		✓		✓		✓

Notes: Effect of baseline disruptiveness rank on high-school completion, centralized exam performance (standardized), and higher education outcomes (Eq. 2). Institutional quality proxied by the average university admission score of students admitted to each institution in earlier cohorts. SEs clustered at the classroom level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

What if we also control for Rank in Baseline Ability?

Student Data: Disruptiveness Rank and Ability Rank

Panel A: Future Disruptiveness and Final-Year GPA

	Future Disruptiveness			Final-Year GPA		
	Grade 10	Grade 11	Grade 12	Grade 10	Grade 11	Grade 12
Disruptiveness Rank	16.442***	11.956***	7.523***	−0.039	−0.112	−0.064
	(1.424)	(1.775)	(1.962)	(0.083)	(0.087)	(0.098)
Ability Rank	−2.236*	−6.421***	−0.271	1.640***	1.497***	1.364***
	(1.138)	(1.833)	(1.874)	(0.081)	(0.105)	(0.113)
Baseline Mean	25.86	31.23	36.72	−0.58	−0.63	−0.81
Baseline SD	14.01	13.37	11.93	0.96	0.94	0.86
Observations	5,848	4,861	4,389	5,923	4,863	4,394

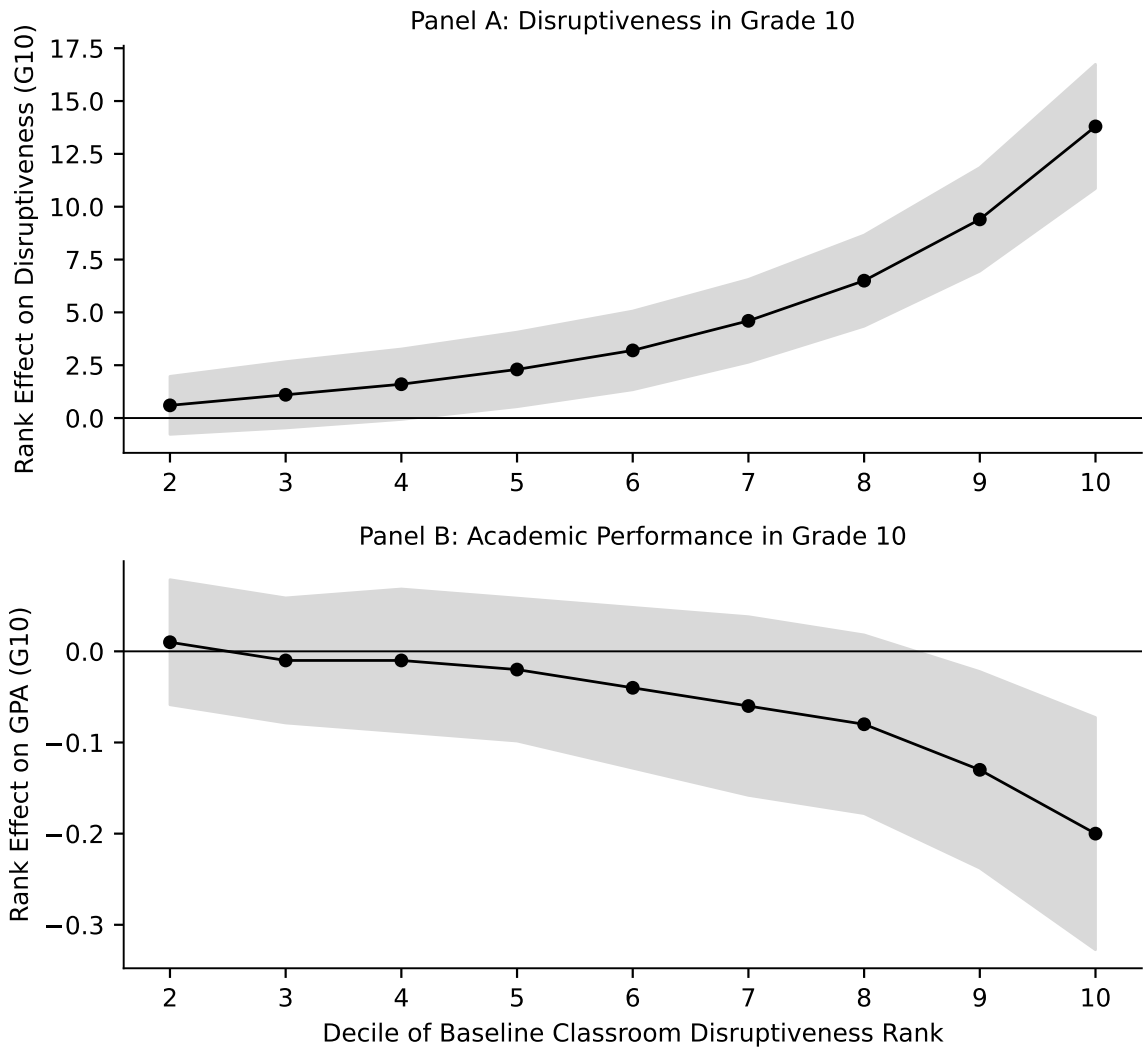
Panel B: High School and Higher Education Outcomes

	On-Time Graduation	National Exam	University Exam	Admitted to Tertiary Edu.	Academic Degree	Quality of University
Disruptiveness Rank	−0.075***	−0.155	−0.285*	0.035	−0.262***	−10.874**
	(0.026)	(0.130)	(0.172)	(0.062)	(0.099)	(5.372)
Ability Rank	0.293***	1.683***	1.677***	0.383***	0.502***	29.981***
	(0.034)	(0.136)	(0.175)	(0.080)	(0.104)	(5.312)
Baseline Mean	0.95	0	0	0.78	0.56	45.23
Baseline SD	0.21	0.99	0.99	0.42	0.50	25.82
Observations	5,923	3,536	2,750	3,536	2,750	2,750
School-Cohort FE	✓	✓	✓	✓	✓	✓
Baseline & Peer Disruptiveness	✓	✓	✓	✓	✓	✓
Baseline & Peer Ability	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓

Notes: Joint estimates of disruptiveness rank and ability rank. Standard errors clustered at the classroom level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Behavioral rank and ability rank capture complementary dimensions of student success.

Nonlinearity: Effects Concentrated at the Top



Heterogeneity of the Behavioral Rank Effect

- **Gender**: worse outcomes for female students in magnitude (except subsequent disruptiveness, which rises more for boys); differences never statistically significant.
- **Early enrollment**: no differential effects between early and regular entrants.
- **Baseline ability**: below-median students show somewhat larger increases in disruptiveness; negative academic effects concentrated among above-median students; differences not significant.
- **School-cohort size and school quality**: no systematic evidence of differential rank effects.

Robustness and Placebo Exercises

- **Class fixed effects** instead of school-by-cohort FE: estimates remarkably stable.
- **Deciles** instead of quintiles as non-parametric baseline controls: qualitative patterns unchanged.
- **Alternative rank construction** (minimum instead of mean rank for ties): nearly identical estimates.
- **Alternative GPA measures** (school-reported end-of-year GPA; subject-by-subject): similar effects across subjects.
- **Joint estimation with ability rank**: behavioral rank effects survive controlling for academic ability rank (shown earlier).

Robustness and Placebo Exercises

- **Class fixed effects** instead of school-by-cohort FE: estimates remarkably stable.
- **Deciles** instead of quintiles as non-parametric baseline controls: qualitative patterns unchanged.
- **Alternative rank construction** (minimum instead of mean rank for ties): nearly identical estimates.
- **Alternative GPA measures** (school-reported end-of-year GPA; subject-by-subject): similar effects across subjects.
- **Joint estimation with ability rank**: behavioral rank effects survive controlling for academic ability rank (shown earlier).
- **Placebo: rank based on *excused* absences**: effects statistically insignificant or an order of magnitude smaller.
- **Permutation test**: 1,000 random reassignments within school-cohorts; true estimates lie well outside the placebo distributions. Figure
- **Measurement error simulations**: rank effects remain significant under additive or multiplicative noise up to 20%.

Outline

Introduction

Institutional Setting and Data
- Institutional Setting
- Data

Measuring Disruptiveness and Rank
- Measure

Methodology and Estimation Framework

Results

Mechanism: Teacher Survey Experiment

Conclusion

Empirical Design: Are Teachers a Factor?

We construct a randomized survey to understand if teachers are a relevant component.

Empirical Design: Are Teachers a Factor?

We construct a randomized survey to understand if teachers are a relevant component.

Stage 1: Relative Disruptiveness

- Teachers evaluate identical student work.
- We hold fixed absolute GPA and unexcused absences.
- We randomize information about whether the student is high or low in classroom disruptiveness.

Stage 2: Add Relative Academic Performance

- Teachers can revise grades, beliefs, and recommendations.
- We reveal whether the student is high or low in academic rank.
- This separates grading from expectations and advice.

Goal: understand whether the admin data effects are consistent with teacher expectations and recommendations as a mechanism.

The Vignette: Student Profiles in Stages 1 and 2

Stage 1: Relative Disruptiveness Revealed

Student File – Exam Submission

Student Code: 047

Class: 10

Gender: Not stated

Number of unexcused absences during the school year: 26

Grade point average (GPA) during the previous school year: 15

With 26 unexcused absences, the student has one **one of the highest** or **one of the lowest** levels of absences in his/her class.

Exercise to be evaluated

Solve the following equation:	$2(x+3)-4=10$
Student solution:	$2(x+3)-4=10$ $2x+6-4=10$ $2x+2=10$ $2x=8$ $x=6$

Stage 2: Also Relative Ability Revealed

Student File – Exam Submission

Student Code: 047

Class: 10

Gender: Not stated

Number of unexcused absences during the school year: 26

Grade point average (GPA) during the previous school year: 15

With 26 unexcused absences, the student has one of the highest levels of absences in his/her class. With an average of 15 out of 20, the student ranks at the **top** or **bottom** of his/her class academically.

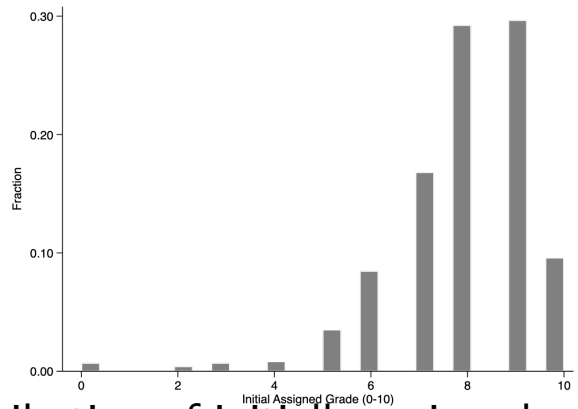
Exercise to be evaluated

Solve the following equation:	$2(x+3)-4=10$
Student solution:	$2(x+3)-4=10$ $2x+6-4=10$ $2x+2=10$ $2x=8$ $x=6$

Randomized: Stage 1—"one of the *highest/lowest* levels of absences"; Stage 2—ranks at the *top/bottom* of the class academically $\Rightarrow 2 \times 2$ profiles. Humanities teachers receive a literature exercise with an analogous mistake.

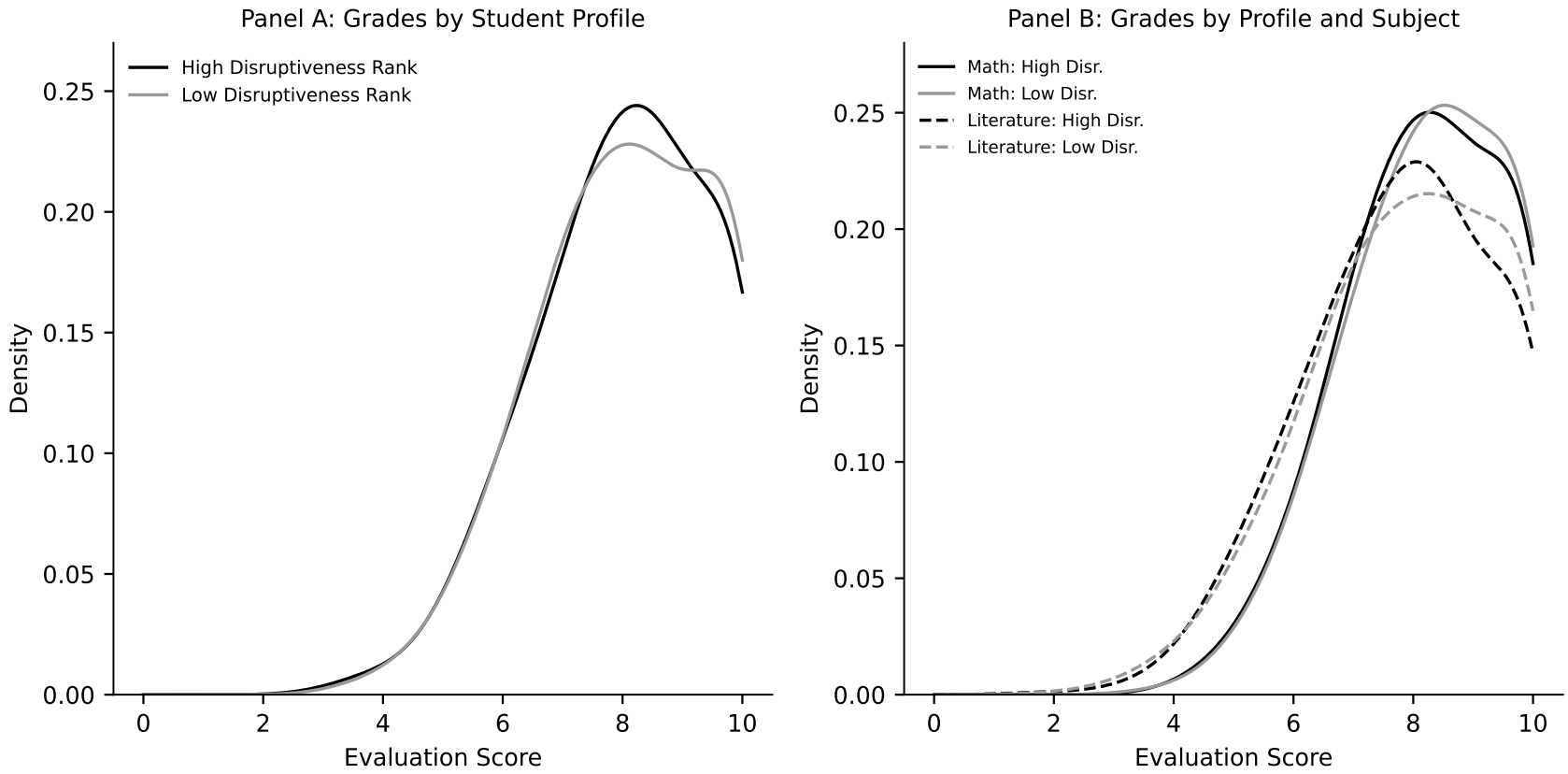
Sample and Randomization

- Analytic sample: **761 in-service teachers**, covering the majority of prefectures in Greece.
  - On average 50 years old; 74% female; 70% hold a postgraduate degree (63% MSc, 8% PhD); 21 years of teaching experience.
- Computer-generated random assignment to profiles:
  - Stage 1: High vs. Low relative disruptiveness $\Rightarrow$ teacher characteristics balanced across arms.
  - Stage 2: High vs. Low relative ability $\Rightarrow$ no significant differences across the four disruptiveness $\times$ ability cells.
- Initial grades concentrated between 7 and 9 (0–10 scale), with sufficient dispersion to detect treatment responses.



Distribution of initially assigned grades.

Stage 1: Grades Do Not Respond to Disruptiveness Rank



Distributions of assigned grades are indistinguishable across high and low relative disruptiveness, overall (Panel A) and within subject (Panel B) $\Rightarrow$ no direct grading channel.

Stage 1: Disruptiveness Rank Shapes Beliefs, Not Grades

	Teacher Beliefs on Student's Career		Recommendation Index	Student Recommendation: Pursue Challenging		Parents Rec.: Pursue Chall.
	Academic	Professional		Major	Occupation	Major
	(1)	(2)	(3)	(4)	(5)	(6)
Disruptive Student Exposure	−0.090**	−0.115***	−0.197*	−0.119*	−0.091	−0.134**
	(0.038)	(0.038)	(0.112)	(0.062)	(0.060)	(0.067)
Mean	0.55	0.51	7.00	3.64	3.58	3.39
Observations	761	761	761	761	761	761
Prefecture FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓

Notes: Effect of exposure to a vignette describing a relatively highly disruptive student. Columns (1)–(2): whether teachers believe the student's behavior will positively affect their academic/professional trajectory. Column (3): index aggregating recommendation outcomes. Columns (4)–(6): recommendations to the student (parents) to pursue a challenging university major or occupation. Prefecture FE and controls for teacher gender, age, education, study abroad, and subject specialization. SEs clustered at the teacher level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Outcomes correspond to the following survey items (1 = certainly not, 5 = definitely yes): "In general, do you believe that the student's behavior may positively influence their future academic performance?","In general, do you believe that the student's behavior may positively influence their future professional career?","In general, would you encourage this student to pursue a demanding university degree program?", "In general, would you encourage this student to pursue a demanding career path?", "In general, would you encourage this student's parents to guide them toward pursuing a demanding university degree program?"

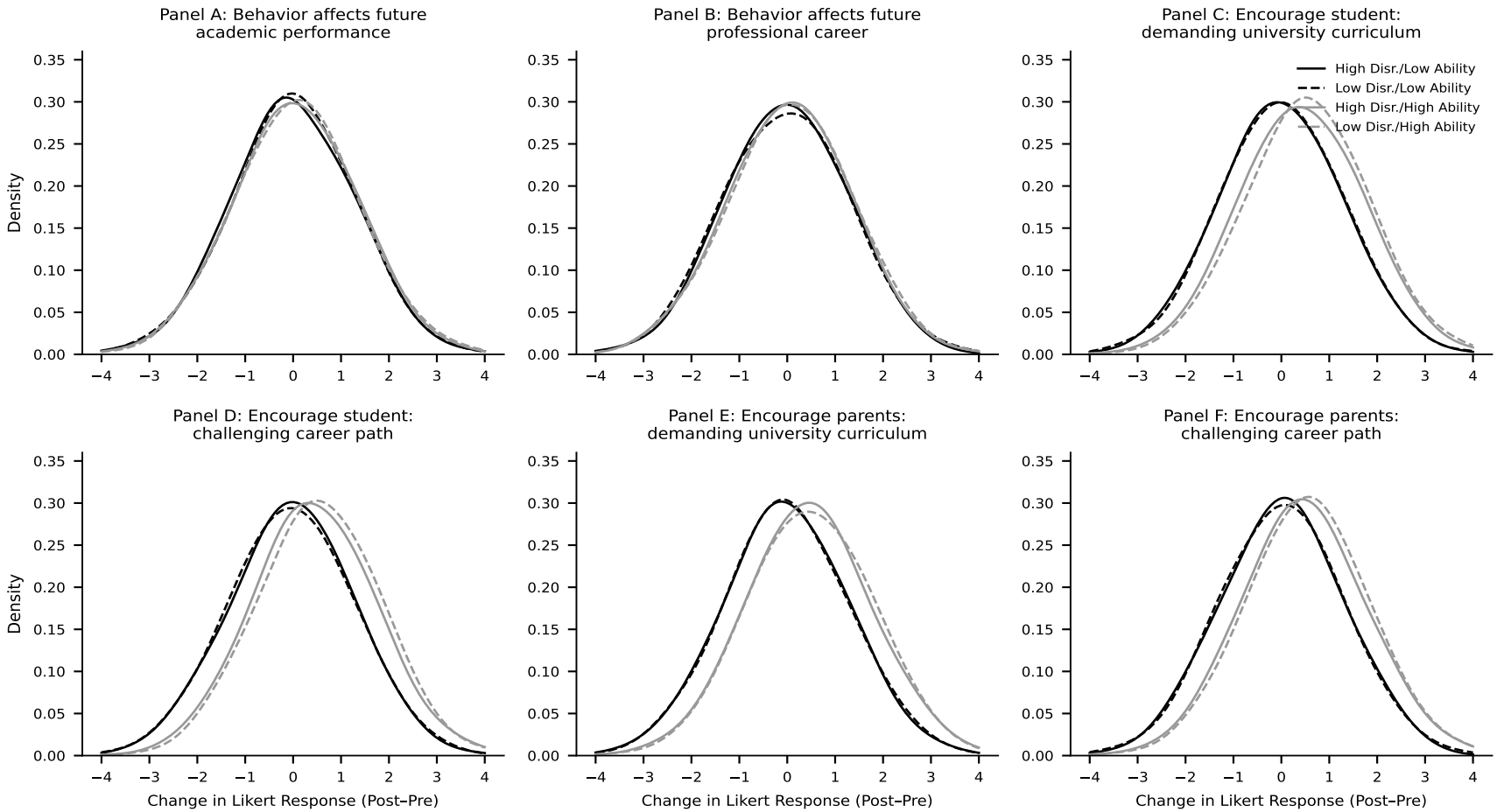
Stage 2: Ability Rank Information and Belief Updating

	Teacher Beliefs on Student's Career		Recommendation Index	Student Recommendation: Pursue Challenging		Parents Rec.: Pursue Chall.
	Academic	Professional		Major	Occupation	Major
	(1)	(2)	(3)	(4)	(5)	(6)
Top Disruptiveness, Top Ability	0.081	0.048	0.517***	0.320***	0.255***	0.270**
	(0.080)	(0.076)	(0.098)	(0.069)	(0.063)	(0.060)
Bottom Disruptiveness, Top Ability	0.079	0.062	0.568***	0.343***	0.242***	0.284**
	(0.083)	(0.080)	(0.101)	(0.068)	(0.072)	(0.058)
Bottom Disruptiveness, Bottom Ability	−0.082	−0.109	−0.017	−0.066	0.007	−0.005
	(0.079)	(0.083)	(0.097)	(0.071)	(0.063)	(0.057)
Observations	761	761	761	761	761	761
Prefecture FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓

Notes: Stage 2 treatment: teachers additionally observe the student's relative academic ability rank within the classroom. Outcomes measured as changes relative to Stage 1; omitted category: Top Disruptiveness, Bottom Ability. Prefecture FE and teacher controls as before. SEs clustered at the teacher level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

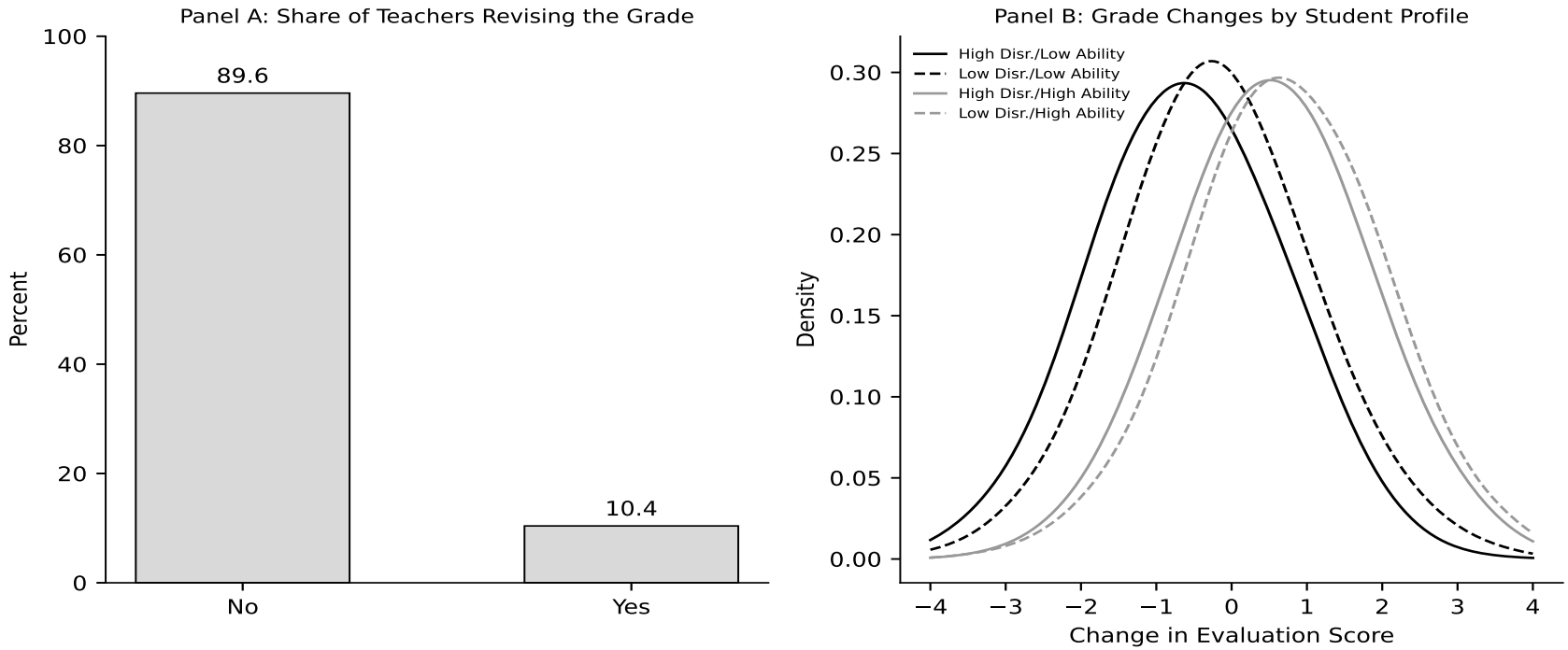
$\Rightarrow$ revealing **high ability rank** triggers substantially more favorable recommendations—even for highly disruptive students. But disruptiveness is **not fully offset** by academic information.

Stage 2: Belief Updating Across the Four Profiles



Kernel densities of Stage 2 − Stage 1 changes. Beliefs (Panels A–B) barely move; recommendation outcomes (Panels C–F) shift right when **high ability rank** is revealed—for both disruptiveness profiles.

Stage 2: Grades Are Sticky; Expectations Move



- **89.6% of teachers do not revise** their initial grade; among revisions, high-ability-rank profiles receive favorable revisions—even when highly disruptive.
- Open-ended responses suggest **strategic grading**: teachers deliberately avoid low grades for disruptive students to sustain engagement—reconciling the grading null with strong belief effects.

Teacher Survey: Findings

- Teachers exposed to otherwise **identical students** described as relatively more disruptive:
  - form systematically **more pessimistic beliefs** about the student's future academic and professional success;
  - provide **less ambitious educational recommendations** to both students and their parents;
  - do *not* assign lower grades $\Rightarrow$ rank operates through an **expectations channel**, not a direct grading channel.

Teacher Survey: Findings

- Teachers exposed to otherwise **identical students** described as relatively more disruptive:
  - form systematically **more pessimistic beliefs** about the student's future academic and professional success;
  - provide **less ambitious educational recommendations** to both students and their parents;
  - do *not* assign lower grades $\Rightarrow$ rank operates through an **expectations channel**, not a direct grading channel.
- Rank is used as a **signal of underlying type**: teachers infer effort, non-cognitive skills, and future potential from relative position, and update when new relative signals arrive (cf. Bursztyn et al., 2020).

Teacher Survey: Findings

- Teachers exposed to otherwise **identical students** described as relatively more disruptive:
  - form systematically **more pessimistic beliefs** about the student's future academic and professional success;
  - provide **less ambitious educational recommendations** to both students and their parents;
  - do *not* assign lower grades $\Rightarrow$ rank operates through an **expectations channel**, not a direct grading channel.
- Rank is used as a **signal of underlying type**: teachers infer effort, non-cognitive skills, and future potential from relative position, and update when new relative signals arrive (cf. Bursztyn et al., 2020).
- Micro-foundation for the administrative results: rank matters not because it changes who surrounds a student, but because it changes how the student is perceived—and who the student believes themselves to be.

Heterogeneity

Outline

Introduction

Institutional Setting and Data
- Institutional Setting
- Data

Measuring Disruptiveness and Rank
- Measure

Methodology and Estimation Framework

Results

Mechanism: Teacher Survey Experiment

Conclusion

Conclusion

- Study whether **behavioral rank** in classroom has persistent effects on students' behavior and outcomes using administrative data and quasi-random classroom assignment.

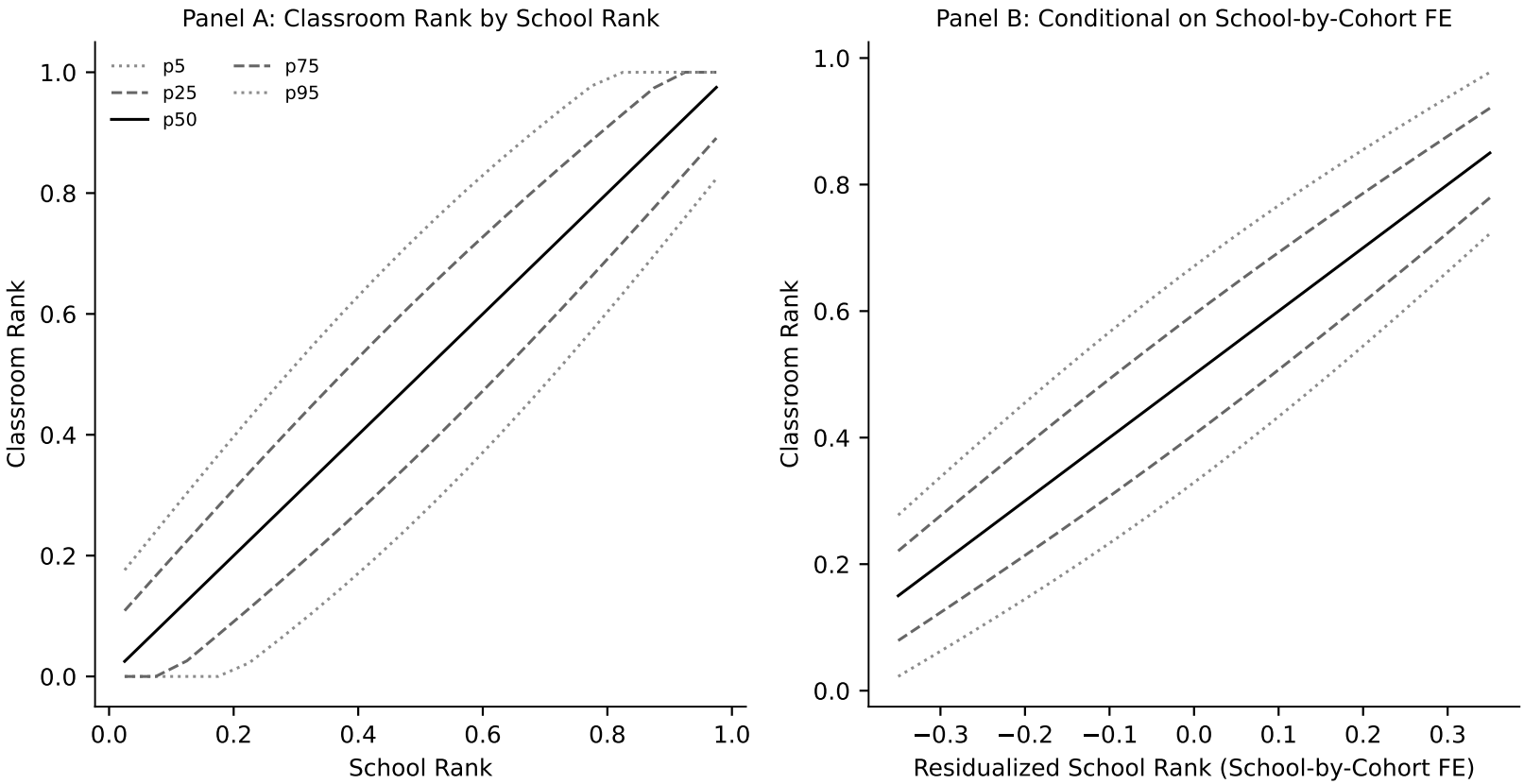
- We find that:
  - Students with a higher disruptiveness rank become more disruptive throughout high school.
  - Higher disruptiveness rank lowers GPA and reduces on-time graduation, academic degree completion, and university quality.
  - The effects are concentrated among students at the very top of the behavioral hierarchy.

- Experimental evidence suggests that teachers:
  - Form less favourable beliefs about future and make less ambitious recommendations about university and careers.

- Behavioral rank captures a dimension of student development distinct from academic ability.

- Classroom behavioral hierarchies may shape educational trajectories through teachers' expectations.

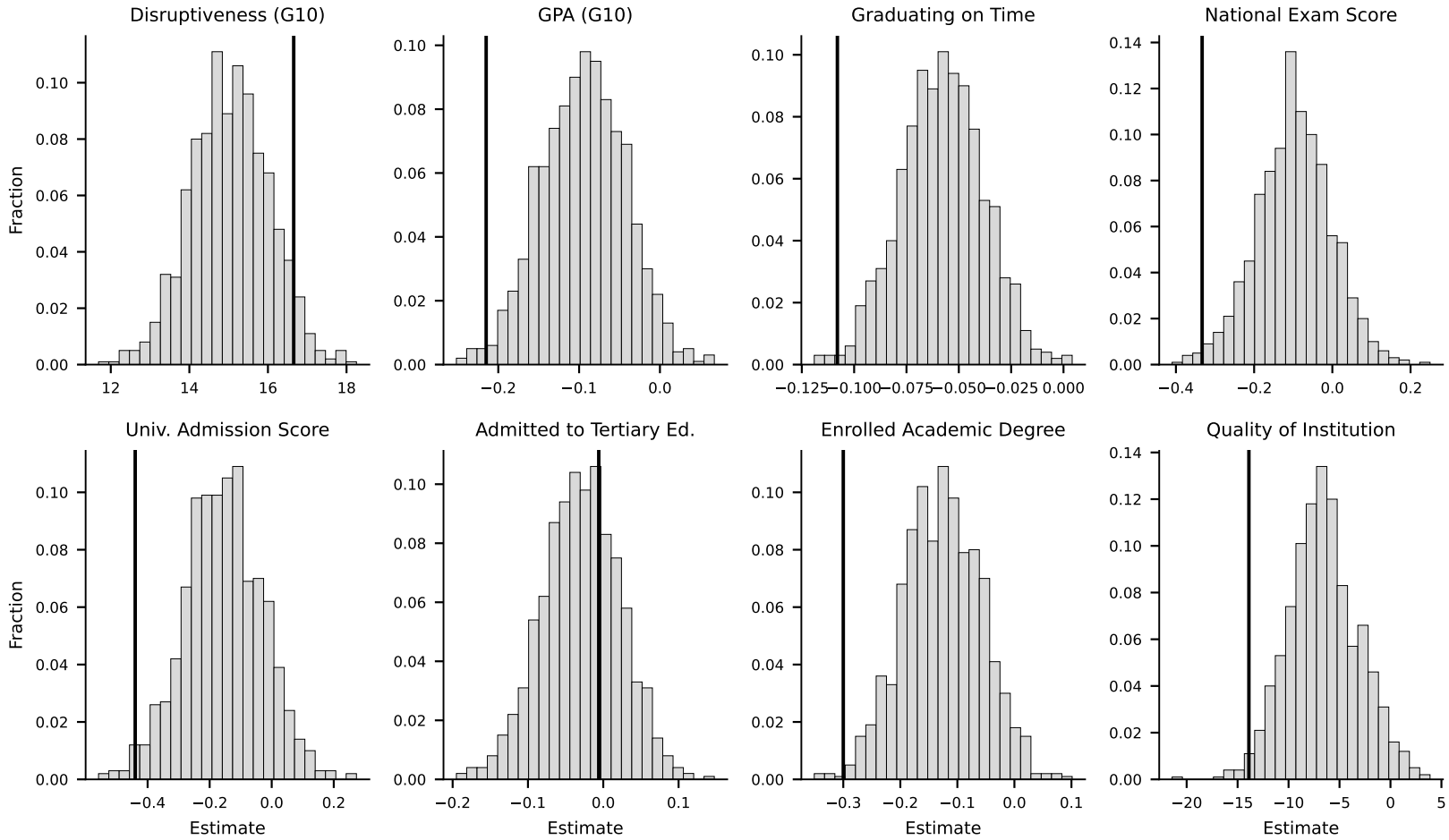
Variation in Classroom Rank within Schools



Percentiles (p5–p95) of classroom rank plotted against students' position in the school-wide rank of Grade 9 unexcused absences. Wide dispersion of classroom rank at every school rank—also after absorbing school-by-cohort fixed effects—is the identifying variation.

Back

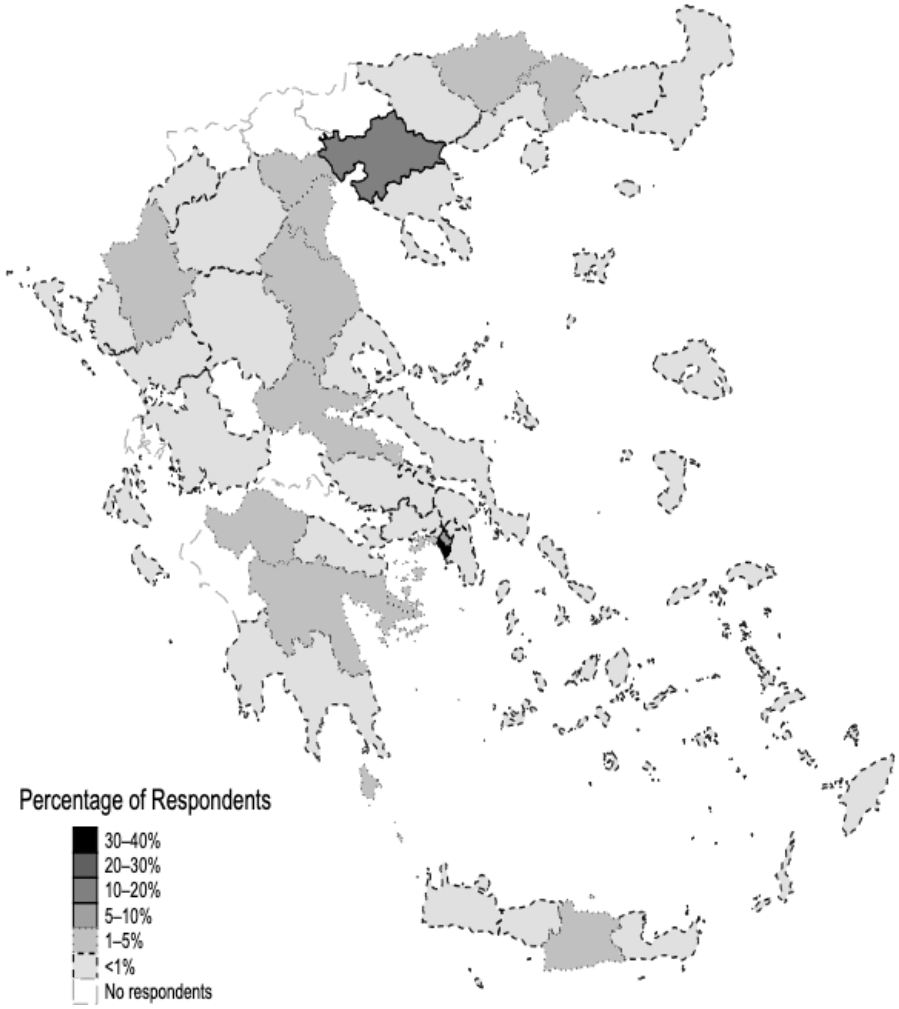
Placebo Distribution of Rank Effect Using Permuted Classes



The only exception is admission to tertiary education, itself indistinguishable from zero.

Back

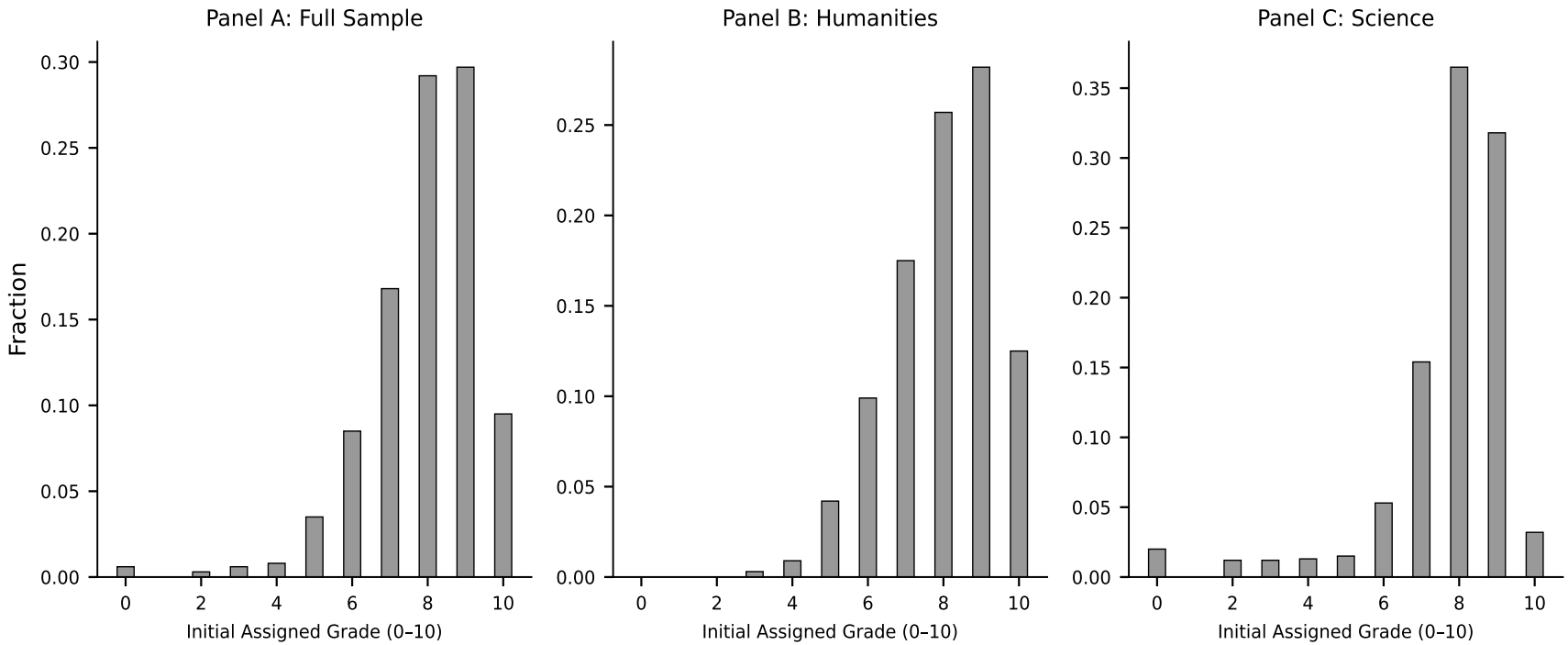
Experiment: Respondents by Prefecture of Residence



Respondents assigned to the nearest NUTS-3 centroid using coordinates recorded at survey completion; sample covers the majority of prefectures in Greece and Cyprus.

Back

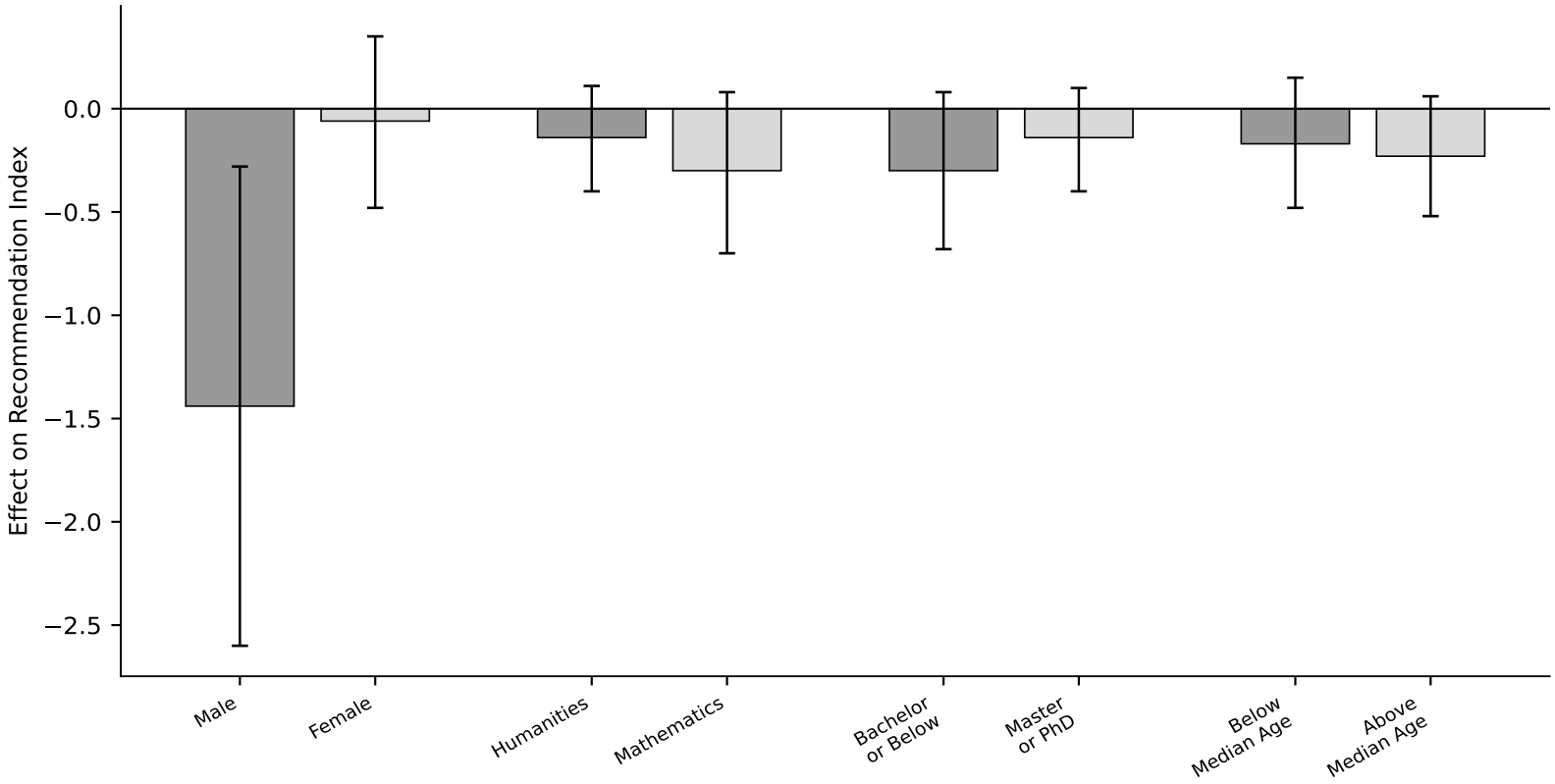
Experiment: Distribution of Initial Assigned Grades



Initial grades (0–10) assigned in Stage 1, prior to any rank intervention: full sample, humanities, and science treatment groups. Grades concentrate between 7 and 9 in all groups.

Back

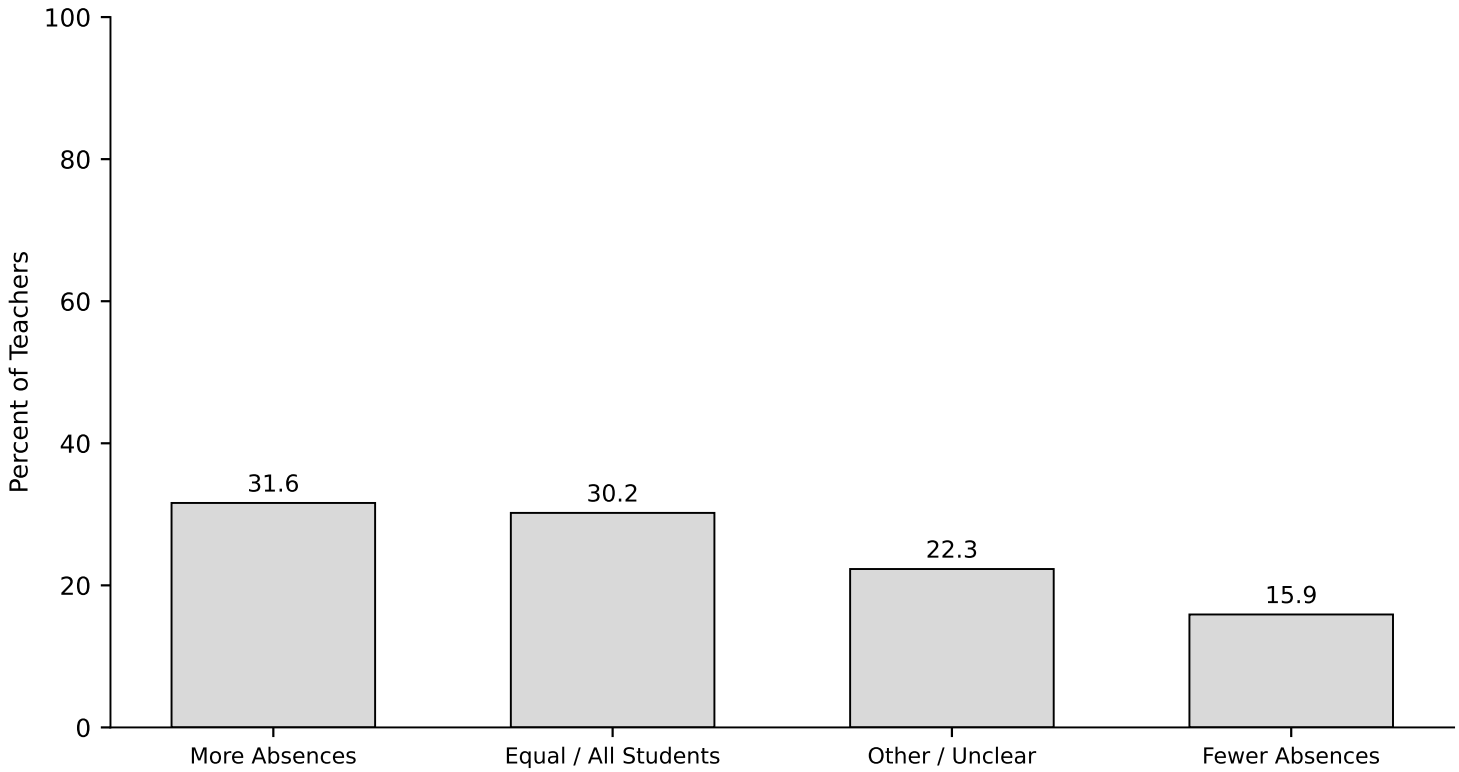
Experiment: Heterogeneity of the Effect on Recommendations



Effect of exposure to a relatively-high disruptive student profile on the recommendation index, by teacher characteristics. Point estimates negative throughout; largest (though imprecise) among male teachers. Baseline controls and province FE; SEs clustered at the individual level.

Back

Experiment: Whom Do Teachers Say They Focus On?



"When teaching, do you devote more time to students with comparatively more or fewer unexcused absences?" ($\approx$ 92% response rate, N = 696). Most common justification for focusing on high-absence students: the need to cover gaps from absences (56%).

Back

Word Clouds