

Supplement to:

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**ONLINE SUPPLEMENT**

**Teacher Sorting and Inequalities in Student Achievement:**

**Unequal Exposures and Differential Returns to Teacher Qualifications**

Said Hassan

Nuffield College, University of Oxford

[said.aj.hassan@gmail.com](mailto:said.aj.hassan@gmail.com)

## APPENDIX A: ADDITIONAL TABLES

**Table A1.** Summary of estimation results testing whether classroom characteristics predict teachers' parental leave spells.

Variable	Est.	(SE)	p-value	R <sup>2</sup>	Obs.
<i>Panel A. One-year lead</i>					
Classroom atmosphere	-0.000	(0.001)	0.554	0.088	128,428
Classroom calmness	0.000	(0.001)	0.393	0.088	128,428
Classroom bullying	-0.000	(0.001)	0.463	0.088	128,428
Classroom motivation	-0.001	(0.001)	0.021	0.088	128,428
Classroom disruption	0.000	(0.001)	0.879	0.088	128,428
Classroom satisfaction	-0.001	(0.001)	0.284	0.088	128,428
Classroom wellbeing index	-0.000	(0.001)	0.368	0.088	128,428
SES index	0.000	(0.001)	0.546	0.088	133,109
Class size	-0.001	(0.001)	0.275	0.088	133,109
Proportion girls	0.000	(0.001)	0.749	0.088	133,109
Proportion minority students	0.000	(0.001)	0.588	0.088	133,109
Average test score	0.000	(0.001)	0.674	0.089	69,598
<i>Panel B. Two-year lead</i>					
Classroom atmosphere	0.000	(0.000)	0.568	0.076	128,428
Classroom calmness	0.000	(0.000)	0.314	0.076	128,428
Classroom bullying	0.000	(0.000)	0.658	0.076	128,428
Classroom motivation	0.000	(0.000)	0.998	0.076	128,428
Classroom disruption	0.000	(0.000)	0.260	0.076	128,428
Classroom satisfaction	0.000	(0.000)	0.366	0.076	128,428
Classroom wellbeing index	0.000	(0.000)	0.587	0.076	128,428
SES index	-0.000	(0.000)	0.934	0.076	133,109
Class size	-0.001	(0.000)	0.041	0.076	133,109
Proportion girls	-0.000	(0.000)	0.358	0.076	133,109
Proportion minority students	-0.000	(0.000)	0.505	0.076	133,109
Average test score	-0.001	(0.001)	0.183	0.074	69,598

*Note:* This table shows estimation results from models predicting the likelihood of going on parental leave for teachers in two lead periods (t+1 and t+2) conditional on classroom characteristics in year t. Every row in the table presents estimates from a single model that only controls for teacher age dummies, teacher gender, and calendar year dummies.

**Table A2.** Estimation results: Asymmetric teacher effects.

	Danish				Mathematics			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Certified, positive	0.092* (0.045)				-0.114 (0.094)			
Certified, negative	-0.013 (0.027)				-0.041 (0.048)			
Specialized, positive		0.133*** (0.039)				0.077** (0.030)		
Specialized, negative		0.002 (0.030)				-0.037 (0.047)		
Experienced, positive			0.030 (0.022)				0.094* (0.040)	
Experienced, negative			-0.020 (0.022)				-0.004 (0.039)	
High school GPA, positive				0.013 (0.013)				0.024 (0.022)
High school GPA, negative				0.023 (0.013)				0.012 (0.024)
Any change	-0.056*** (0.003)	-0.057*** (0.003)	-0.056*** (0.003)	-0.056*** (0.004)	-0.084*** (0.005)	-0.085*** (0.005)	-0.086*** (0.005)	-0.096*** (0.009)
Constant	0.120*** (0.001)	0.120*** (0.001)	0.120*** (0.001)	0.124*** (0.001)	0.099*** (0.001)	0.098*** (0.001)	0.099*** (0.001)	0.129*** (0.002)
N (observations)	372,756	372,756	372,756	215,032	113,292	113,292	113,292	49,570

Note: Standard errors clustered on individual (student) identifiers in parentheses. N (observations) refers to the total number of observations in the sample.  
\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

**Table A3.** Asymmetric teacher qualification effects by subject and students' socioeconomic background.

	Danish		Mathematics	
	(1) Low-SES	(2) High-SES	(3) Low-SES	(4) High-SES
<i>Panel A. Certification</i>				
Certified, positive	0.225** (0.079)	-0.008 (0.049)	-0.144 (0.156)	-0.102 (0.111)
Certified, negative	0.032 (0.044)	-0.044 (0.034)	-0.088 (0.082)	-0.009 (0.056)
Any change	-0.061*** (0.004)	-0.052*** (0.003)	-0.087*** (0.008)	-0.081*** (0.007)
Constant	-0.130*** (0.001)	0.332*** (0.001)	-0.180*** (0.002)	0.341*** (0.002)
<i>Panel B. Specialization</i>				
Specialized, positive	0.201** (0.062)	0.077 (0.049)	0.026 (0.050)	0.113** (0.036)
Specialized, negative	0.055 (0.048)	-0.038 (0.038)	-0.101 (0.062)	0.026 (0.070)
Any change	-0.061*** (0.004)	-0.053*** (0.003)	-0.087*** (0.008)	-0.084*** (0.007)
Constant	-0.130*** (0.001)	0.332*** (0.001)	-0.181*** (0.002)	0.341*** (0.002)
<i>N</i> (observations)	171,022	201,708	52,698	60,586

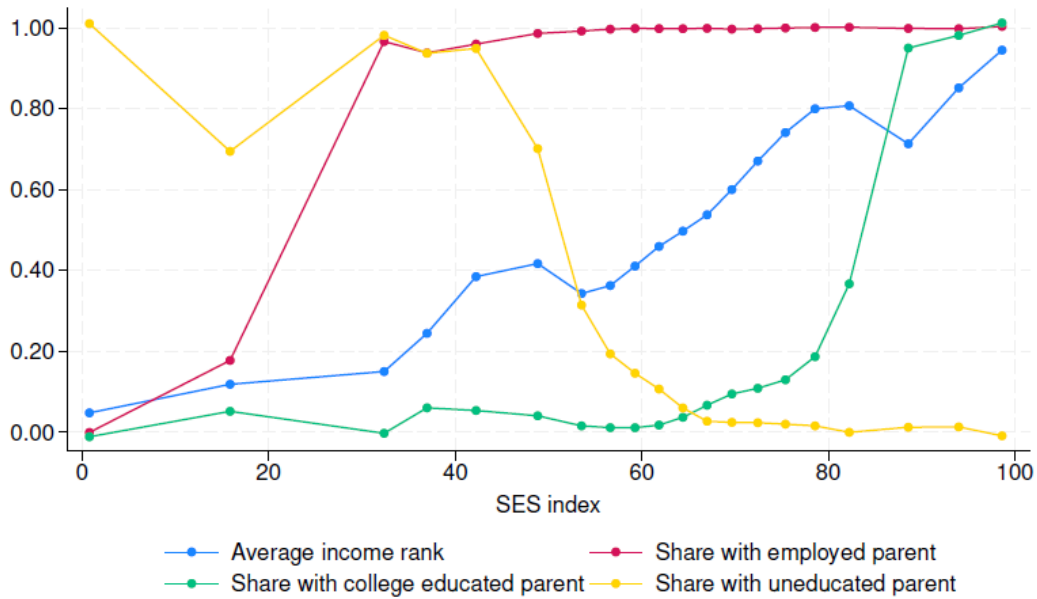
*Note:* Standard errors clustered on individual (student) identifiers in parentheses. *N* (observations) refers to the total number of observations in the sample. The two panels present results for the social gradient effects by teacher qualification measures separately.

\* $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

## APPENDIX B: DETAILS ON SES INDEX

The socioeconomic index used in this article is constructed by taking the first principal component of the following parental variables (similar to Bjerre-Nielsen and Gandil, 2024): College education dummy; No education dummy; Income rank in the population of the highest earning parent; Employment dummy equal to 1 if at least one parent was employed. All variables measured at child age 5 before entry to school. Figure B2 shows how these four variables relate to the composite SES index.

**Figure B1.** Parental characteristics by SES index score.



## APPENDIX C: DETAILS ON CLASSROOM ENVIRONMENT INDEX

To construct the “classroom environment” measures and composite index, I use data from the Danish Well-Being Survey which is a full population survey of all Danish children’s well-being in Danish public schools (see <https://www.nationaltrivsel.dk>) from the school year 2014/15 onward.

Table C1 below shows the survey questions used to construct the composite measure “classroom environment”. I also use individual variables in the estimations for Figure 5. I first standardize the items by grade-year combination, and then also standardize the final composite variable.

Question	Code in Survey03	Code in Survey49
Are you happy with your class?	q2	q2
Can you concentrate during the lectures?	q9	q8
Does anyone bully you to the degree it makes you sad?	q13	q14
Are the lectures boring?	q16	q19
Is it difficult to hear the teacher during lectures?	q18	q24
Is your classroom pleasant to be in?	q19	q39

Note: “Survey03” refers to the grade 0-3 survey, and “Survey49” refers to the grade 4-9 survey.