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XII CONGRESSO
PORTUGUÊS DE SOCIOLOGIA

4 - 6 ABRIL 2023

What can schools do in a context of segregation?

**Social heterogeneity and students performance in
Spanish primary schools using TIMSS 2019 data**

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Introduction

Objetive 1: Analysing school composition effect and its impact on between-schools inequalities.

Objetive 2: Assesing the possibilities to tackle the school socioeconomic composition (SEC) effect.

H1: SEC has an additive effect on individual achievement, resulting in educational inequalities as a consequence of the unequal distribution of pupils between schools.

H2: There is also heterogeneity of results between schools with the same social mix, which would point to the possibilities of resilience and effective practices to ameliorate educational outcomes in segregated schools.

Data and methods:

Sample: 501 schools and 9,555 students of 4th grade in Spain, taken from TIMSS 2019 microdata.

- **Mean comparisons** to measure school composition effect after controlling by individual SES, distinguishing by types of schools classiflicated by **hierarchical clustering** (Ward's method)
- **Multilevel Linear Regression** (MLM), controlling by both individual and school level variables, to analyze the impact of school composition on students achievement in MATHS, assesing the possible moderating rol of teaching and school organizational practices.

School segregation

Two ways of approaching its analysis:

-School segregation (SS) as a social process:

- Usually assumed to have *negative consequences by itself* (on intercultural relationships, on social mobility...).
- Often raised as an *issue of concern for policy makers* due to its implications for social cohesion.

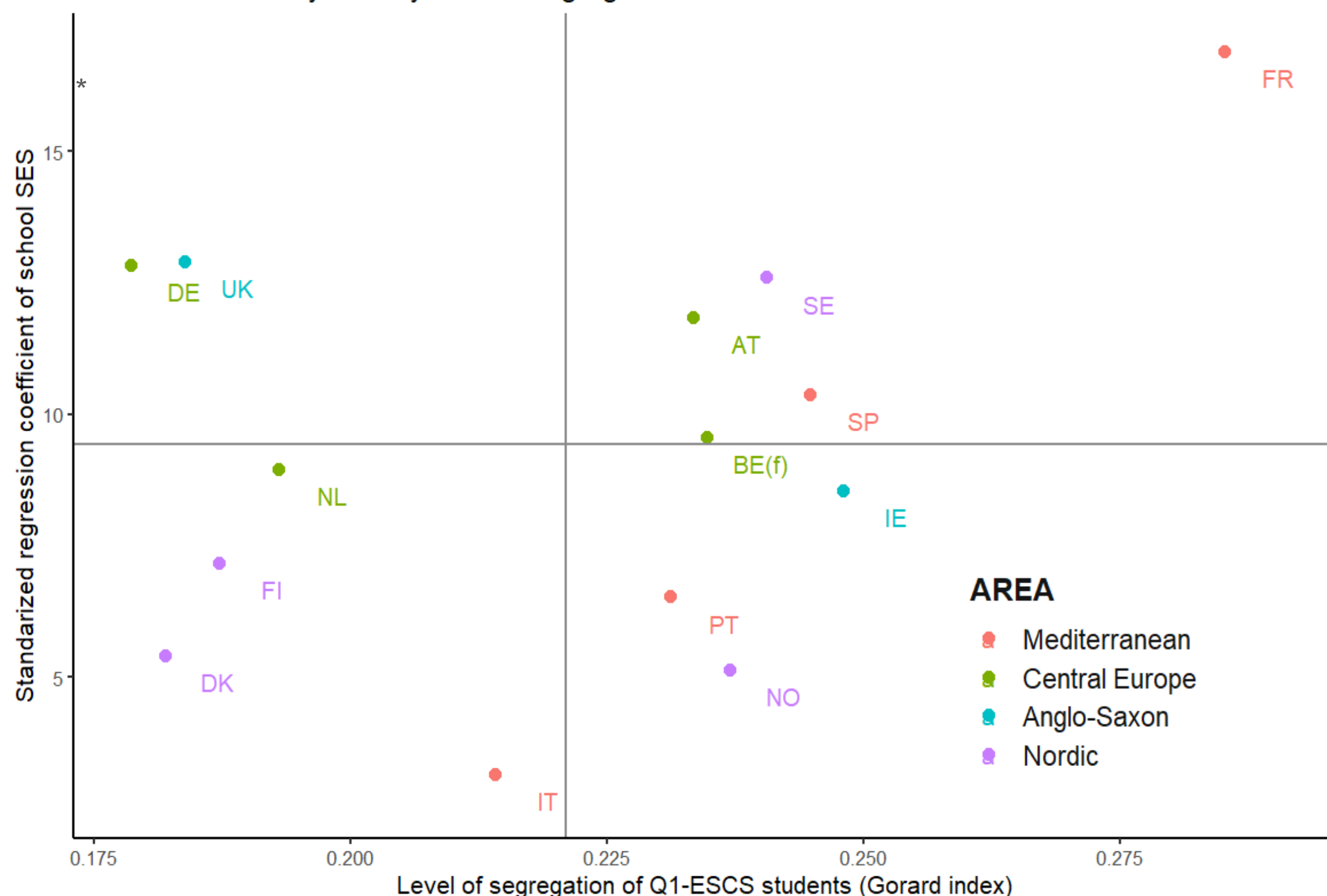
-Effects of school segregation:

- ...on students' performance, educational inequalities or the quality of education systems.
- Less explored: effects on primary school pupils and *possibilities of resilience*.
- Effects of SS can be tackled at *different levels* and by *different actors*.
- We use this latter approach as a starting point, focusing on the relationships between the individual and the school level.

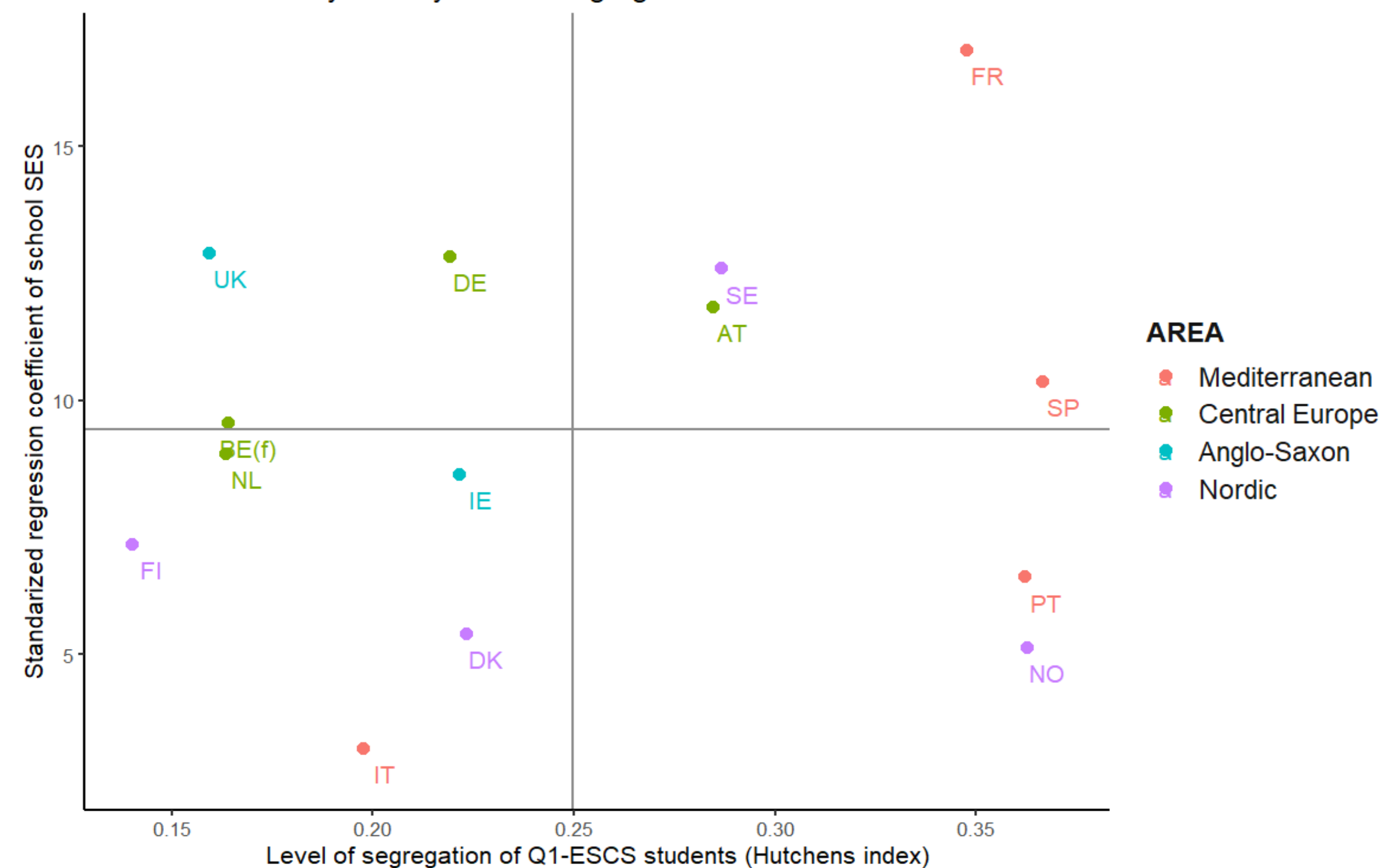
School social segregation and SEC effect on 4th grade students achievement in mathematics

(Gorard & Hutchens indexes by standardized regression coefficient of school SES after controlling by individual SES)

Impact of school socioeconomic composition on student's performance in MATHS by country level of segregation of Q1-ESCS students



Impact of school socioeconomic composition on student's performance in MATHS by country level of segregation of Q1-ESCS students



n = 59,605 students in 2,177 schools

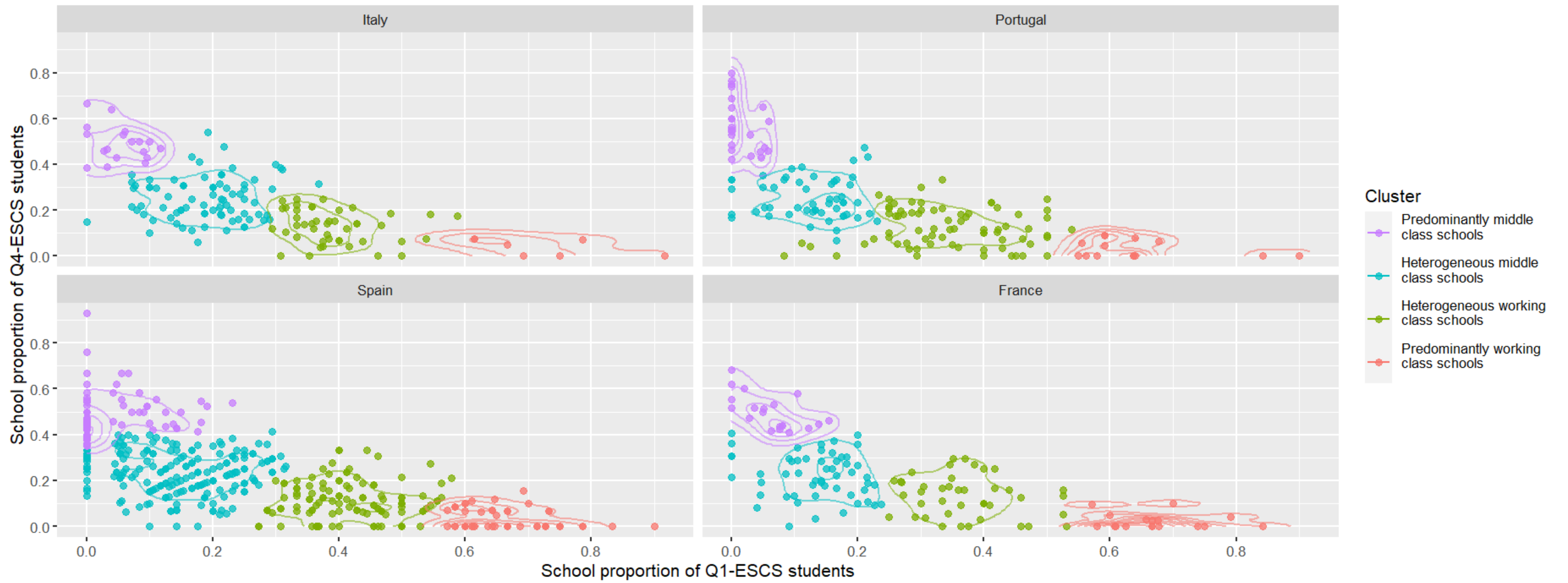
Own elaboration from TIMSS 2019 microdata (IEA, 2020)

* SES: student socioeconomic status, measured through SES (Index of Socioeconomic and Cultural Status)

* SEC: school socioeconomic composition, mean SES of schools with more than 10 valid values of SES

Clustering of schools by proportion of students in the 1st quartile of SES and students in the 4th quartile of SES (ESCS- Index of Socioeconomic and Cultural Status)

n = 878 schools, 20,352 students

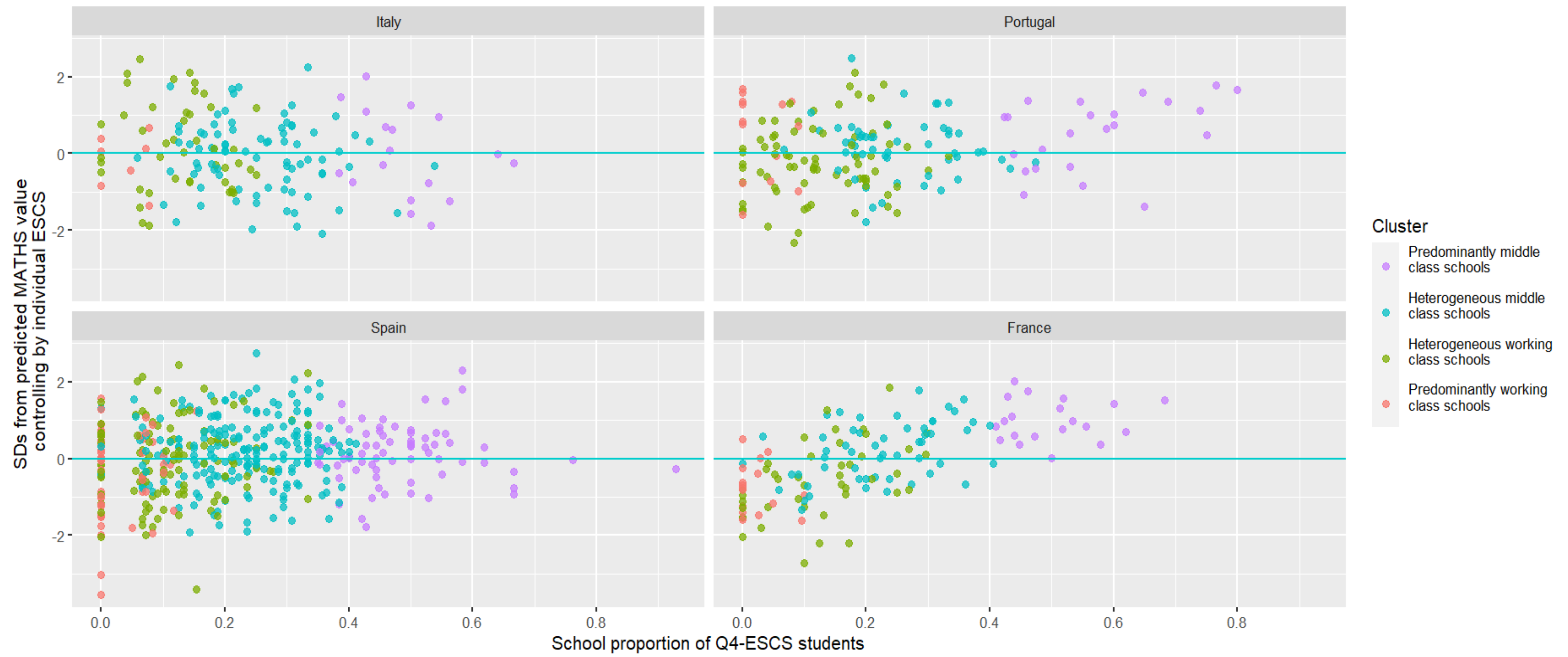


Clustering method: Ward

Own elaboration from TIMSS 2019 microdata (IEA, 2020)

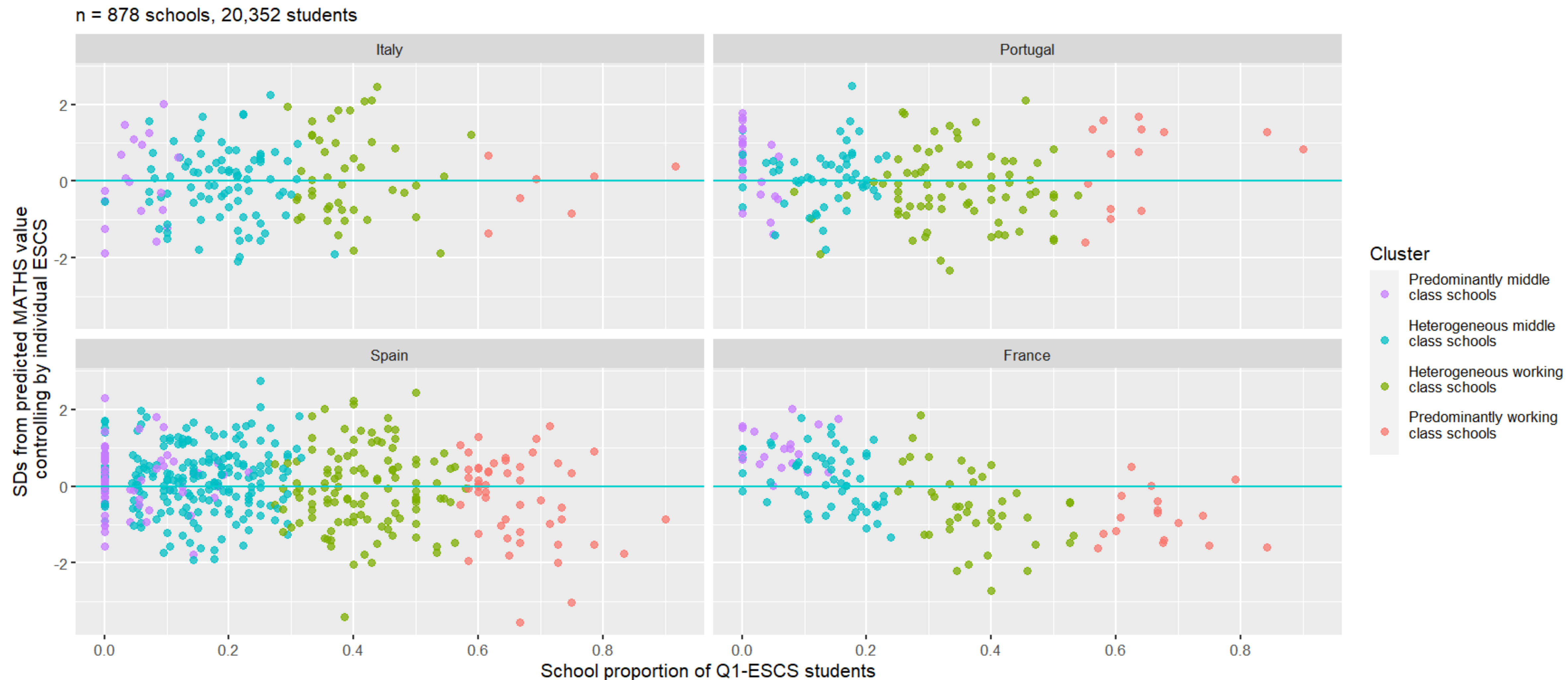
Mean school standardized residual from predicted MATHS value in function of individual SES, by proportion of Q4-SES students

n = 878 schools, 20,352 students



Own elaboration from TIMSS 2019 microdata (IEA, 2020)

Mean school standardized residual from predicted MATHS value in function of individual SES, by proportion of Q1-SES students



Own elaboration from TIMSS 2019 microdata (IEA, 2020)

RESULTS AND DISCUSSION

Social heterogeneity and primary school students' achievement

- In Spain: +1sd change in school SES is associated with a 10-point increase in individual MATHS achievement.
- This is equivalent to 58% of the individual SES impact on primary school students' performance in mathematics (a moderate SEC effect).
- Dissimilarity in the schooling of students from Q1-SES and Q4-SES (↑ Hutchens index) appears to be related to a higher performance of Q4-SES students.
- A higher concentration of Q1-SES pupils in some segregated schools seems to be associated to a greater SEC effect, particularly affecting Q1-SES students.

RESULTS AND DISCUSSION

Possibilities of schools to tackle segregation effects

- School organizational practices closely related to the socioeconomic and cultural characteristics of the student body in primary schools: when controlling by composition variables, the effect of organizational practice on MATHS disappears.

- Teaching experience significant after including the compositional variables in the model:
 - Suggests reducing the high **rate of teacher turnover** in segregated schools as a positive measure for improving the outcomes of these group of schools.
 - The same can be said for the **number of students** in the class.

- Significant cross-level interaction school-SES & student's AGE:
 - Suggests grade retention may be burdening the possibilities of resilience in lower-SES schools.
 - Grade retention prevention policies**, especially in the lower grades of compulsory education: effective measure to mitigate SEC effects.

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