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Dissecting Inequalities in Performance Scores: A Comparative Analysis of the Effects of Stratification.

Tarek Mostafa

Institute of Education, London, United Kingdom

Research Questions

This paper analyses the mechanisms of stratification and inequalities in educational achievements. The main objective is to determine how stratification leads to unequal educational outcomes and how inequalities are channelled through student characteristics, school characteristics and peer effects. The paper shows that inequalities should no longer be measured as the simple impact of student backgrounds on performance scores; but should also be seen as the result of stratification-determined variations in school and peer quality. Therefore, inequalities in educational achievements need to be decomposed between the various determinants.

It should be noted that the magnitude and nature of stratification vary between countries according to the characteristics of education systems (e.g. comprehensive schooling vs. selective systems). Thus, a comparative approach is needed in order to fully analyse the mechanisms of inequalities under different systems. The selected countries are Germany Denmark, the UK (the data is dominated by England), and Italy, and the dataset used is PISA 2003.

The paper is organized in three sections. In section one a descriptive analysis is used to shed light on the education systems of the five selected countries and to provide insight into the functioning of stratification. In section two, a multilevel model is elaborated in order to quantify the impact of student, school and peer characteristics on performance scores, and the results on the regressions are interpreted in the context of the institutional characteristics of each country. Finally, in the last section, policy implications are derived.

Methods

Methodology: the education production function is estimated using a multilevel estimation approach, which was selected for several reasons:

- The availability of data on students and schools.
- The nesting of students within schools.
- Multilevel analyses allow for a better decomposition of the variance components.
- The ability to introduce random slopes on student variables.
- The ability to control for a wide array of student and school characteristics including peer quality (in order to avoid the omitted variable bias, heteroscedasticity and endogeneity problems).

Note that endogeneity problems arise in multilevel analyses when some school or student characteristics are not accounted for. These problems typically arise in the OECD PISA reports, since the different regressions do not account for the full range of available variables. In fact, a limited number of variables are simultaneously controlled for, and hence the results tend to be systematically overestimated.

Data, variables, and Specification: In this paper, PISA data is used. The major feature of this data source is the natural nesting of students within schools which allows for the use of multilevel analyses. The variables included in the model account for three different types of factors:

- § Student characteristics: Economic, Social, and cultural status, immigration status, interest in learning and motivational factors, as well as subjective perceptions of school environment.
- § Peer effects: economic, social, and cultural peer effects, immigration peer effects (% of non-natives in a school), motivational peer effects, as well as other peer effects resulting from generalized perceptions of school environment.
- § School characteristics: school type, financial resources (quality of infrastructure, availability of computers...), discipline, teacher-student relations, as well as some teacher characteristics.

Research findings

On the one hand, the research developed within the remit of this article sheds light on the mechanisms of stratification and inequalities in attainments. On the other hand, the comparative analysis allows for a better understanding of the functioning of these mechanisms under different schooling systems.

The results showed clearly that comprehensiveness-driven school homogeneity is a source of equality since it dilutes the impact of school characteristics on performance scores. Denmark is the most comprehensive and most equal among the selected countries. The rest of them have higher levels of inequalities than Denmark for different reasons. Early selection and the high levels of social disparities in Germany mean that inequalities are transmitted through school and household characteristics. This is also the case in the UK even though inequalities are more moderate. The UK also retains the highest level of elitist private schooling. In Italy, household characteristics have limited effects and inequalities are transmitted through school characteristics. This finding reflects school heterogeneity in terms of their funding and peer quality which may be the result of geographical disparities between north and south.

In general, I can conclude that the delayed selection of students is associated with limited and delayed inequalities. Other major findings include the following. Firstly, Private schooling is found to have a negative effect on performance scores in all countries except in the UK indicating that the apparent superiority of private schools is the result of better peer quality and funding. Secondly, social peer effects are non-linear in their means in three of the selected countries indicating that the distribution of peers within schools also affects their performances. Finally, it is important to note that this analysis can be further extended through the inclusion of country-level data that accounts for the macro characteristics of each country. Furthermore, inequalities can also be treated as a dynamic concept if the necessary data is available.