



# Systematic differences across evaluation schemes and educational choice<sup>#</sup>



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## ABSTRACT

Using large-scale register data from Denmark in a difference-in-differences framework, I analyse whether systematic disparities between internal teacher scores and external exam scores in the school-leaving certificates are linked to pupil characteristics. Such differences may matter for post-compulsory education choices in school systems where external assessments are not available when these choices are made. I use sibling fixed effects methods to simulate changes in educational choices for disadvantaged groups if they were graded by their teachers as their advantaged peers. The results suggest that probabilities of enrolling in more ambitious tracks would increase across the whole ability distribution and for all disadvantaged groups. In particular, in the middle of the ability distribution the results predict an increase of 5% points in migrant pupils' probability of enrolling in high-school. The corresponding increase for pupils with low educated parents is 4% points, closing 13% of the high-school enrolment gap to pupils with high educated parents.

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## 1. Introduction

Countries all over the world use academic assessments to monitor pupil performance. Many different assessment procedures are in use in different parts of the educational system and across countries, and their reliability and validity have received a great deal of research attention (e.g. Baird, 2010). Disparities by type of assessment are potentially important, and their impact on educational outcomes depends on the

education system they are part of. In institutional settings using several types of assessments, such disparities merely introduce uncertainty about pupils' academic ability. Yet in settings relying on only *one* type of assessment, they may produce systematic divergence in the evaluation of pupils' academic ability. Among those groups of pupils whose skills are evaluated less favourably, this may lead to less ambitious educational choices, and, consequently, lower educational attainment.

While disparities across different types of assessments appear to be a common trait in a variety of school systems, their potential *impact* on educational outcomes will vary across school systems depending on the way in which different types of assessments are used and their timing in relation to education choices. Some school systems pass information from more than one type of assessment (e.g. both teacher and exam or test scores) to pupils, teachers and parents at different stages of schooling. For example in the UK pupils traditionally take both external exams at various stages of schooling and receive teacher scores, and have thus been repeatedly

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informed about their academic ability by different types of assessment at the time when they are making decisions about post-compulsory education choices.<sup>1</sup> In these settings, while grading disparities between different types of evaluations will introduce *uncertainty* about pupils' ability, they are less likely to lead to systematically different feedback on academic abilities. Yet in other school systems external assessments are administered only as school-leaving exams, such that only teacher assessments are available towards the end of compulsory schooling, when pupils make crucial educational choices. In such settings, systematic differences between teacher and exam scores potentially play a larger role, as it is the only measure of academic performance available to pupils, teachers and parents at the time of application for post-compulsory education. In this case, systematic differences between teacher- and exam scores across groups of pupils may lead to less ambitious choices regarding post-compulsory education for pupils disadvantaged by teacher grading – and these groups may end up being underrepresented in subsequent education. This study therefore contributes to the debate over pupils' educational performance disparities by gender, parental education and migration background and the potential implication on their future life chances.

In this paper, I analyse systematic grading disparities and their potential consequences for post-compulsory education choices in the setting just described. More specifically, I consider grading gaps at the end of lower secondary education in Denmark. Pupils' academic performance is evaluated only by their teachers until the end of lower secondary school<sup>2</sup>. The first formal external assessment is the school-leaving examinations at the end of grade 9.

While the application procedure for post-compulsory schooling is completed in March of grade 9, results from the school-leaving exams are only available at the end of June. Assessment scores seldom rigorously bar entry to upper secondary tracks in Denmark. However, these scores nonetheless influence the perceptions of pupils' academic ability of those involved in the decision process (pupils, parents, teachers, school counsellors) – and these perceptions guide the decision whether to enrol in high school, in vocational education and training (VET), or to drop out of the education system.

This study contributes to the literature by being the first to examine the potential consequences of grading gaps in an education system, where the only results available to decision makers at the time when pupils make crucial educational choices are from subjective assessments. Thus this is the first study to estimate the potential 'costs' of this type of evaluation scheme for educational attainment. Moreover, most existing studies focus either on gender or ethnicity. In a unified framework, this study not only examines both dimensions but also adds socio-economic status (SES) – approximated by parental education – as a third dimension.

<sup>1</sup> Traditionally, pupils have been assessed by a National Curriculum test by the end of Key Stage 2 (age 11) and Key Stage 3 (age 14). However, in 2009 testing at age 14 was abolished.

<sup>2</sup> In 2010, a national test system has been introduced, providing standardised testing throughout the earlier years. The actual role these tests play in informing pupils, parents and teachers has not yet been examined.

The analysis is based on large-scale observational data from Danish administrative registers. In the main analysis, I use the population for the seven cohorts of pupils who completed grade 9 in 2005–2011, about 400,000 young people. First, I examine whether differences between teacher- and exam scores vary systematically by pupil characteristics (gender, parental education and migration background). I use a difference-in-differences framework (across type of assessment on the one hand, and across gender, parental education and ethnicity on the other) to estimate these grading disparities, exploiting the data structure with two scores for each subject, a teacher score and an exam score. After documenting the existence of grading disparities, I simulate in a sibling-fixed effects setting how choice probabilities for post-compulsory education would change for pupils who are disadvantaged by teacher grading, if they were rewarded equally by their teachers as their advantaged peers (with similar exam performance).

I find that boys, pupils with low educated parents and migrants are systematically assessed lower by teacher scores than girls, pupils with high educated parents and natives with similar exam performance. Grading disparities by migration background are smallest (0.08–0.12 SD) and are largely explained by differences in family background. Grading differences by gender are larger (0.10–0.19 SD) and are not accounted for by differences in background characteristics. Disparities by parental education are the largest – between 0.24 and 0.36 SD – yet almost half the gaps can be referred to differences in (other) family background characteristics. Using sibling fixed effects to account for differences in time-constant parental attitudes and preferences that are thought to influence both achievement and educational choice, the simulation results suggest that if disadvantaged groups were rewarded with teacher scores equal to those of their advantaged peers with similar exam performance would increase the probabilities of enrolling in more ambitious education tracks across the whole ability distribution. For example, for migrant pupils the predicted probability of enrolling in high-school increases by 5% points. The corresponding increase for pupils with low educated parents is 4% points, which amounts to closing 13% of the high-school enrolment gap to pupils with high educated parents. Predicted changes for boys are modest.

The paper is organised as follows. I outline the background and related literature in [Section 2](#). [Section 3](#) provides a brief description of the Danish evaluation system. [Section 4](#) presents the data, and [Sections 5, 6 and 7](#) show the results. [Section 8](#) concludes.

## 2. Background and related literature

This paper adds to a small literature comparing different assessment methods in schools by pupil characteristics. Recent empirical work has shown that subjective assessment of pupils' academic abilities (e.g. teacher scores) often differ from (more) objective assessment methods such as exam or test results in ways that are systematically related to gender, ethnicity or even overweight. Most studies explore differences by gender ([Cornwell, Mustard, & Van Parys, 2013](#); [Lavy, 2008](#); [Falch & Naper, 2013](#)), although [Burgess and Greaves \(2013\)](#) focus on ethnic minorities and [Zavodny \(2013\)](#) on

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