The impact of school organization on educational gender inequalities

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Among the possible determinants of the observed gender gaps in education, a vast literature examines the role played by gender-biased teacher evaluations. Moreover, a recent and growing literature stresses the positive effect of good school management on different educational outcomes. This study investigates whether the observed systematic differences in teacher evaluations between boys and girls in Italy are affected by the quality of the school leadership and by specific managerial practices implemented in schools. The empirical analysis will exploit the change in school principal as exogenous shock and evaluate whether a school leader with better managerial practices reduces gender-related grading bias and, through this, gender educational inequalities.

Extended Abstract

Recent research addresses the concerns that the Covid-19 pandemic shock has further exacerbated the presence of already existing gender educational issues. Indeed, international data show the presence of significant differences between boys and girls in educational outcomes. In most countries, women with the same level of education as men are underrepresented in many scientific and technical degrees, which typically lead to better-paying occupations (OECD, 2012; Eurydice, 2010). The latest OECD-PISA 2022 results, which also capture the effects of the recent pandemic, reveal an increase in gender differences in many countries, with Italian boys scoring 21 points higher than girls. In particular, male students typically outperform their female classmates in math test scores since the earliest years of schooling, and the gap worsens as school grades progress. This difference is the most pronounced among all participating countries in the survey. Furthermore, educational data clearly indicate that, when comparing students with equal academic performance, boys are more likely to repeat school years than girls and are the predominant group among those leaving school prematurely. On the one hand, the Covid-19 shock seems to have led to increased school dropouts mainly among boys (UNESCO, 2022). On the other hand, the recession caused by the COVID-19 pandemic, also labeled a “shecession,” implied an overly negative economic effect for women relative to men in the labor market (OECD, 2021). This phenomenon is mainly interpreted as driven by the previously described women's educational choices and job specialization.

Among the possible determinants of these gender gaps in education, a vast literature examines the role played by gender-biased teacher evaluations. On one hand, teachers' beliefs about gender roles can influence students' attitudes, behavior, and, through self-fulfilling prophecy mechanisms, their educational outcomes (Rosenthal, 1987; Stobart et al., 1992). Additionally, there is extensive literature describing how stereotypes (explicit or implicit) can influence teachers' interaction with students. In the classroom, this can be reflected in differences in feedback received by boys and girls, both in terms of evaluations and in the amount of attention devoted to individual students during learning phases in class (Ertl et al., 2017; Alan et al., 2018).

This issue is related to the complex literature on how biology and experiences interact to produce skills and abilities that have both a genetic or an acquired character (Cunha and Heckman 2009; Stobart, Elwood, and Quinlan 1992). Cultural stereotypes, e.g., about girls' science abilities ('girls are not good at math'), can also play an important role in generating gender bias in schools in specific subjects. This literature suggests that cultural factors and social conditioning affect gender differences in educational outcomes, and this may explain why differences in math and science tend to disappear in more gender-equal societies (Machin and Pekkarinen 2008; Guiso et al. 2008; Else-Quest, Hyde, and Linn 2010). These are mainly cross-country studies that identify cultural differences as an important factor in determining gender imbalances in educational attainments and stress the importance of pursuing gender equality policies to narrow the gender gap in STEM studies. Moreover, self-confidence and anxiety are not gender-neutral and can affect educational outcomes, and girls tend to be more affected by 'maths anxiety' than boys (Murphy 1982).

A second source of gender inequalities is related to the role of school principals (SPs). Indeed, there is a growing attention regarding the influence exerted by the managers in charge of running the school (Bloom et al., 2014). However, we still know relatively little about this issue because assessing the impact of managerial practices on student outcomes is a difficult task, mostly due to the challenges of measuring such practices. Thus, while there is a large qualitative literature stressing the importance of the role of SPs and leadership on school outcomes, only a few recent studies have attempted to quantify the role played by SPs on student outcomes.

In recent years, some encouraging results have emerged from the growing literature on the positive effect of good school management on educational outcomes (Bloom et al., 2015). Using RCTs in US schools, Fryer (2014) finds that management matters, although evidence on the persistence of the treatment is inconclusive. Bloom et al. (2012, 2015) and Di Liberto et al. (2015 and 2023) use the World Management Survey (WMS henceforth), a tool that measures the quality of the managerial practices within organizations (Bloom and Van Reenen, 2007), to show that schools that are better managed are also characterized by better-performing students. These results, based on different countries, suggest that enforcing good managerial practices could be an effective way to improve student achievements. However, we still know little about the role of school management in educational gender inequalities.

Given the large and documented gender gap in educational attainment, this project asks whether schools also affect gender inequality, and if so, what are the mechanisms by which this occurs. This research line investigates the role of the quality of managerial practices and of school leadership on educational gender inequality and, specifically, on the possible teachers' gender-biased evaluations.

This project uses Italian administrative data on student scores from INVALSI (The National Institute for the Evaluation of the Education and Training System) that is merged to a survey on school principals. The survey includes measures of the managerial quality of school principals computed following the WMS protocol (Di Liberto et al., 2015, 2023).

A primary step of the project is to investigate whether there are systematic differences in teacher evaluations between boys and girls in Italy. For this purpose, following an approach existing in the literature (Lavy, 2008; Di Liberto et al., 2021), we compare teachers' grades to standardized test scores in math and Italian by gender. The underlying hypothesis of this extensive literature is that standardized scores are free from gender biases. Since this

comparison is based on two different assessment modalities (teacher grades and standardized tests), the result does not allow separately identifying the possible presence of teachers' gender stereotypes from the different assessment methods. In fact, the literature highlights that even the latter are not gender-neutral (Murphy, 1982; Stobart et al., 1992; Burgess and Greaves, 2013). However, the comparison still provides an overall measure of the gender gap and enables us to investigate different mechanisms that can influence the gap.

Using this comprehensive measure of the gender gap in assessments as primary outcome, the study aims to investigate if different managerial practices adopted by school principals affect the gender gap in teacher grading behavior.

The analysis will exploit the change in SP as exogenous shock and evaluate whether an SP with better managerial practices reduces gender-related grading bias. The analysis will be based on a quantile regression approach, allowing studying potential heterogeneities along the score distribution for both girls and boys.

The impact of this study on the state of the art of research on gender bias is first to describe the presence of gender bias in student evaluations and the relationship with school management quality. In some countries, recent changes have been made to assessment guidelines implemented in schools with the specific purpose of reducing gender inequalities in education (see Prøitz, 2013, for Norway, and Hvidman and Sievertsen, 2021, for the Danish case). The results could thus provide valuable insights into the role of teacher training and the definition of assessment guidelines implemented in the Italian school system.

This study is also related to other studies that investigate the role of gender biased assessments using alternative methodologies to measure teachers' stereotypes against both a specific gender or ethnicity such as the use of the Implicit Association Tests (IAT) (Carlana, 2019; Alesina et al., 2018) or that exploit the comparison of pairs of siblings (Figlio, 2005).

Finally, it also fits in the strand of literature that suggests that cultural factors and social conditioning affect gender differences in educational outcomes (Machin and Pekkarinen, 2008; Guiso et al., 2008; Else-Quest et al., 2010). These are cross-country studies that identify cultural differences as an important factor in determining gender imbalances in educational attainments and stress the importance to pursue gender equality policies in order to narrow the gender gap in STEM studies.

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