STUDENTS: INEQUALITIES AND INCLUSION

VIII Seminar "INVALSI data: a tool for teaching and scientific research"

edited by
Patrizia Falzetti

FrancoAngeli

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Introduction

by Patrizia Falzetti

Ideally, schools should provide equal opportunities for all students. However, they are often unable to avoid perpetuating the inequalities found in wider society. Promoting inclusion means recognising the value of all differences and ensuring that every student has what they need to learn and grow, regardless of their starting point or background. This topic was discussed at the VIII Seminar, "INVALSI data: a tool for teaching and scientific research" (Rome, 23-26 November 2023) and this volume comprises a selection of the contributions that were presented. The chapters address the issues of educational inequality and early school leaving in Italy and Europe, adopting a variety of perspectives and focusing particularly on the processes that enable them and the strategies that can be used to combat them. The first chapter introduces the concept of implicit dispersion, referring to students who, despite having completed the first cycle of education, have not acquired the expected basic skills. Analysis of INVALSI survey data and the MIM Student Registry data shows a strong correlation between implicit early school leaving and subsequent dropping out. This highlights the predictive potential of this indicator with respect to early leaving of education and training (ELET) status, and the importance of identifying targeted policies.

Chapter two compares the Italian and Spanish school systems, with a focus on assessing the educational backgrounds of migrant students. The analysis of standardised tests and territorial diagnostic assessments reveals differences between native and foreign students, prompting reflection on inclusion policies and methods of skills certification.

Chapter three explores the phenomenon of educational resilience, which is defined as the ability of disadvantaged students to achieve highly.

Chapter four investigates the relationship between teachers in precarious employment situations and disadvantaged students, analysing whether the

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occupational instability of teachers contributes to perpetuating inequalities. Based on a large longitudinal dataset, the study reveals a correlation between teacher precariousness and the socio-economic and migratory background of students, particularly at secondary level.

Chapter five addresses the issue of how inequalities are reproduced in schools, using a combination of administrative data and a pilot survey conducted in one hundred Italian schools.

The sixth and final chapter of the volume analyses the geographical variation in assessment standards between northern and southern Italy. It highlights that teachers in southern provinces tend to be more lenient regarding the results obtained in standardised tests. Based on INVALSI longitudinal data, the study shows that the gap is not solely attributable to the traditional North-South divide but is also influenced by the composition of provincial cohorts.

As a statistical service, we hope that reading this volume will provide the tools for interpretation and operational ideas for improving the school system, offering theoretical reflections, empirical evidence and operational guidelines to promote a more equitable and inclusive system that can enhance the potential of all students.

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1. Implicit school drop out: personal and contextual features of a complex phaenomenon

by Lorenzo Maraviglia, Ornella Papa, Giuseppina Le Rose

The aim of this study is to deepen the understanding of the phenomenon of implicit drop out, regarding students who complete compulsory studies without acquiring fundamental skills, and its relationship to explicit drop out. As suggested by INVALSI (Ricci, 2019), an early identification of implicit drop out could allow actions to improve student performance and prevent explicit drop out. To support this hypothesis, we have built a proxy of implicit drop out taking the lower percentiles of the joint distribution of Italian and Mathematics skills from INVALSI 8th grade tests; data are from school year 2019. By cross-referencing INVALSI data with those of the Student Registry from Minister of Education, we discovered a strong correlation between implicit drop out condition at the completion of lower secondary school and the circumstance of no longer attending school five years later. Subsequently, through statistical simulations, we showed that implicit drop out condition is equally predictive of ELET condition. These results support the practical usefulness of the notion of implicit drop out proposed by INVALSI; the choice adopted by the Italian Ministry of Education to increase funding of schools with a high rate of implicit drop out is particularly suitable, according with the importance of school resources to contrast drop out (Save the Children, 2022).

L'obiettivo di questo studio è approfondire la comprensione del fenomeno della dispersione implicita, riguardante gli studenti che completano l'istruzione secondaria senza acquisire competenze fondamentali, ed esplorare la sua relazione con la dispersione esplicita. Come suggerito dall'INVALSI (Ricci, 2019), un'identificazione precoce della dispersione implicita potrebbe consentire azioni per migliorare le prestazioni degli studenti e prevenire la dispersione esplicito. A supporto di questa ipotesi, abbiamo costruito un

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proxy di dispersione implicita, prendendo il percentile più basso della distribuzione congiunta delle competenze di Italiano e Matematica provenienti dalle prove INVALSI di 8° grado. Incrociando i dati INVALSI con quelli dell'Anagrafe studenti del Ministero dell'Istruzione e del Merito (MIM), abbiamo rilevato una forte correlazione tra la condizione di dispersione implicita al termine della scuola secondaria di primo grado e la circostanza di non frequentare più la scuola cinque anni dopo. Successivamente, attraverso simulazioni statistiche, abbiamo dimostrato che la condizione di dispersione implicita sia ugualmente predittiva della condizione ELET. Questi risultati supportano l'utilità pratica della nozione di dispersione implicita proposta dall'INVALSI, così come la conseguente decisione del MIM di aumentare i finanziamenti alle scuole con un alto tasso di dispersione implicita appare particolarmente appropriata, in ragione della comprovata importanza delle risorse scolastiche nel contrasto della dispersione degli studenti (Save the Children, 2022).

1. Introduction

School drop out is a complex multidimensional phenomenon that has strong implications in terms of quality and equity of the educational system. It includes various aspects ranging from failure to complete compulsory schooling to dropping out from upper secondary and tertiary education.

According to Italian Ministry of Education, in 2021 the drop out percentage for lower secondary school was 0.64% (equal to 10,938 pupils), while for upper secondary school this figure amounts to 3.79% (equal to 98,787 students). In summary, around 110,000 students drop out of Italian schools every year, in addition to those who are lost in the transition from the first to the second cycle. Young people who drop out of school increase the number of ELETs, a group whose amount is constantly monitored by the European Commission. ELET stands for *Early Leaver from Education and Training* and refers to peopleaged 18 to 24 who have not achieved a secondary school diploma or a vocational training qualification, neither are atttending a school or VT course.

Reducing the percentage of ELETs is one of the goals of the "Europe 2020" Strategy, with a target set at 10%, then reduced to 9% to be achieved by 2030. In Italy, the most recent figures (ISTAT, 2023) estimate ELETs at 11,5%, still higher than European average (despite in a decreasing trend).

School drop out has been shown to be correlated with various factors associated to students and to their families; these factors can be divided into

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status (i.e. parental education, socio-economic status, gender, family structure) and alterable (i.e. academic failure, lack of attendance and motivation, misbehaviour) risk factors (Malmberg-Heimone *et al.*, 2018). Numerous studies have highlighted the influence of parents' education on the decision to continue studying after compulsory education and on the choice of the type of high school; having at least one graduated parent increases the probability of choosing lyceum rather than vocational education or technical education (Checchi and Flabbi, 2006). Those who come from low-income, uneducated or single-parent families are at greater risk of dropping out of school (Markussen *et al.*, 2011). These students show lower expectations of completing school (Esch *et al.*, 2014; Sagatun *et al.*, 2014; Hawkins *et al.*, 2013); they also report unsatisfactory relationships with teachers and classmates, expectations of failure, poor motivation and low commitment (Renaud-Dubé *et al.*, 2015; Lessard *et al.*, 2007). In the above-mentioned cases there is a high proportion of inadequate intrinsic motivation and low profit. School performance has been indicated as one of the strongest predictors for the completion of secondary school (Quiroga *et al.*, 2013; Rumberger, 2011), although the low achievement is usually the last stage of a long-term process (Lessard *et al.*, 2007).

Given the relevance of the topic, it would be desirable to have robust indicators capable of early identifying those most at risk of dropping out of school. In this study we will focus on implicit or hidden drop out, a measure of skills achievements (fulfilment of learning targets) that has been developed by the Italian National Institute for the Evaluation of the School System (INVALSI) and is available since 2019.

After presenting the concept of hidden drop out we will illustrate and discuss its possible applications for the purpose of explicit drop out prevention.

2. The implicit drop out

The implicit drop out, internationally more known as "hidden drop out" (Sultana, 2006; Rosenblum, Goldblatt and Moin, 2008; Makarova and Herzog, 2013; Bilige and Gan, 2020) is a concept widespread in Italy by INVALSI since 2019. In fact, the INVALSI results reveal a high percentage of students (almost 10% in the post Covid pandemic) who complete the compulsory studies without acquiring fundamental skills in Italian, Mathematics and English. These students do not possess the minimum skills to participate actively in society, to enter the job market or to undertake university studies, despite having completed secondary school. According to INVALSI's defini-

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tion implicit drop out refers to students who conclude the secondary school cycle without reaching at least:

- level 3 in Italian and Mathematics on a scale from 1 to 5 (defined by INVALSI);
- level B1 in English (as defined according to international standards).

The concept of implicit drop out is complementary to that of explicit drop out, but more subtle because less evident; therefore, investigating implicit drop out and its specific relationship with explicit drop out is very important and urgent. The characterization of implicit drop out is one of the prerequisites for the composition of a broader interpretative framework of the functioning and dysfunctionalities of the Italian school system – especially with reference to the target of improving results and resilience of most vulnerable students. It would be very useful to identify the aspects and conditions that increase educational success of disadvantaged students. So, it is necessary to analyse the characteristic of students at risk, the local contexts and the type of schools where drop out occurs with greater intensity but also to investigate on structural and organizational elements that can help defeat the effects of socio-economic disadvantage. Certainly, being able to measure the overall phenomenon of drop out at the onset and identify the factors that contribute to it would provide policymakers and schools with essential information for preventive actions (Ricci, 2019). For example, a recent study conducted by Save the Children investigates on differences in spaces, resources, and time school in primary school throughout the country (Save the Children, 2022). Due to the results obtained from MIUR and INVALSI data, the report recommends an increase in the supply of educational time, spaces, and services.

The study highlights the importance of the spread of kindergartens as well as full-time teaching and canteens in all primary schools. These last two measures alone would make it possible to prevent drop out and improve the learning levels of pupils in our country, especially those who come from the most economically and socially disadvantaged families. The drop out has been studied so far in our country from the point of view of the social, cultural, and economic features of most exposed students. In terms of geographical variability, much emphasis has been placed on differences between macro-areas of the country. Less attention has been paid to the characteristics of the schools where drop out occurs with greater intensity. Schools are an essential safeguard in the fight against inequality; a quality school, which therefore offers safe spaces, adequate infrastructure and services, can provide equal learning opportunities for all students, even, and above all, for those who are most disadvantaged.

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Implicit dispersion is a phenomenon conceptually related to explicit dispersion, but in ways that need to be analysed in depth. At the level of schools or territories, for example, the incidence of implicit drop out could go hand in hand with that of explicit drop out, or it could constitute a channel through which, in some way, complex territorial systems try to compensate the problem of early school leaving. These are complex issues that need further theoretical and empirical investigation. In the following we focus on a few more pragmatic questions. First, if implicit drop out can be defined and measured at an early level in the school career, when most students are still attending school and enforcement actions can be implemented. Second, if such hypothetical early implicit drop out condition is as an empirical precursor of explicit drop out, so that interventions can be targeted on those more at risk of early school leaving. Trying to answer these questions, we will combine data from different sources and make use of various analytical techniques, including statistical simulation.

3. The present study

3.1. Research questions

As we have seen, implicit drop out condition (abbr. ID) refers to students who place themselves at the lowest rungs of the skills ladder, in Italian as well in Mathematics and English.

Such a definition implies the identification of a discrete skills threshold. To a certain extent this can be problematic, since it is more plausible to assume that skills are rather distributed along a continuum. On the other side, unique identification of students at risk may be an advantage in terms of the possibility of targeting interventions.

In any case, the notion of implicit drop out supplies a stimulus to reanalyse the connection between low achievement status and specific outcomes, such as the decision to abandon the studies before completion.

In a trivial sense, low achieving students are the more likely candidates to early education leaving (Rumberger, 2011)[1]; but does setting some threshold in skills help to capture discontinuities or other peculiar features in the risk of early leaving? Does treating ID as a truly discrete condition allow to target

[1] By early leaving we refer to leaving education before achieving an upper secondary title. This notion corresponds substantially to Eurostat (2023) definition of *Early Leavers form Education and Training* (abbr. ELET) which we will use as synonym in the following.

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resources towards those who need it most? Are we talking about something that can improve the effectiveness of out interventions or cast light on some additional features of the phenomenon that we are investigating?

In order to allow effective intervention, any critical condition related to skills (or achievements) should be identified at an early stage. Considering how INVALSI tests are organised, a plausible reference point could be provided by tests administered to 8th grade students. For the purposes of our analysis, we will refer to the cohort of students who took the tests in 2014. Assuming subsequent regular studies, these students should have completed upper secondary school in 2019[2] – the last year before pandemics. It is reasonable to think that Covid-19 emergency has altered, at least temporarily, drop out trends (Alderighi *et al.*, 2023). We think it safer, for an exploratory study, to focus on a Covid-free cohort of students; if nothing else, to have a benchmark for the evaluation of more recent tendencies.

3.2. Data

In our analysis we will use individual data collected by INVALSI for the whole cohort of students who attended 8th grade tests in 2014. This amounts to a total of 509,727 records. INVALSI 8th grade tests were not yet mandatory in 2014. Participation rates, overall and by NUTS2 region, are reported in Table 1[3].

It can be noticed that participation was substantial in all regions, peaking at 95% in some Southern areas[4].

INVALSI records contain Italian and Mat test scores[5] and additional socio-economic information about the students and their families. Test scores are expressed on a standardized scale with mean at 200 points and standard deviation of (about) 40 points. Drawing on the INVALSI database, we identified the students who, five years later, were still enrolled in school, either progressing regularly or having accumulated one or more years of delay. The results are shown in Table 2.

[2] We refer to the regular duration of the upper secondary school cycle.

[3] Participation rates are calculated taking the 13 years old population (as supplied by ISTAT for year 2014) as denominator.

[4] The fact that data are not complete introduces a possible bias in the analysis. This holds in principle, despite the fact that participation rates were high all over the country. We do not investigate this issue further below, focusing instead on the analysis of relationships in the available population.

[5] In 2014 English tests were not yet administered by INVALSI at 8th grade students. Therefore, we base our proxy of ID condition (see below) only on Italian and Mat test scores.

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The fact of no longer attending school five years later may depend on a plurality of causes, including having moved abroad and, obviously, having abandoned upper secondary school before completion. We will return to this (crucial) point later. In the meanwhile, we will focus on the mere circumstance of not appearing in school records anymore (abbr. OUT).

Tab. 1 – Participation rates to INVALSI 8th grade tests, year 2014

NUTS2 Region	*13-years-old pop. (ISTAT)*	*INVALSI individual records*	*Participation rate*
Piemonte	33,411	39,019	85.6
Lombardia	80,069	93,571	85.6
Veneto	42,298	47,317	89.4
Friuli-Venezia Giulia	9,133	10,611	86.1
Liguria	11,038	12,685	87.0
Emilia-Romagna	34,752	39,104	88.9
Toscana	28,618	32,148	89.0
Umbria	6,781	7,735	87.7
Marche	12,463	14,017	88.9
Lazio	47,293	52,213	90.6
Abruzzo	11,003	11,850	92.9
Molise	2,570	2,810	91.5
Campania	63,413	66,679	95.1
Puglia	40,907	43,058	95.0
Basilicata	5,439	5,645	96.4
Calabria	18,870	19,743	95.6
Sicilia	48,785	52,583	92.8
Sardegna	12,884	14,192	90.8
Total	509,727	564,980	90.2

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Tab. 2 – Students belonging to the 2014 8th grade cohort enrolled and not enrolled in school five years later

	In		*Out*	*Total*	*In*		*Out*	*Total*
NUTS2 Region	*Regular*	*Repeating*			*Regular*	*Repeating*		
Piemonte	21,776	5,179	6,456	33,411	65.2	15.5	19.3	100.0
Lombardia	49,682	12,416	17,971	80,069	62.0	15.5	22.4	100.0
Veneto	28,157	6,551	7,590	42,298	66.6	15.5	17.9	100.0
Friuli-Venezia	6,071	1,646	1,416	9,133	66.5	18.0	15.5	100.0
Liguria	7,322	1,842	1,874	11,038	66.3	16.7	17.0	100.0
Emilia-Romagna	23,444	5,719	5,589	34,752	67.5	16.5	16.1	100.0
Toscana	19,477	4,953	4,188	28,618	68.1	17.3	14.6	100.0
Umbria	5,266	749	766	6,781	77.7	11.0	11.3	100.0
Marche	9,430	1,563	1,470	12,463	75.7	12.5	11.8	100.0
Lazio	33,361	6,258	7,674	47,293	70.5	13.2	16.2	100.0
Abruzzo	8,282	1,409	1,312	11,003	75.3	12.8	11.9	100.0
Molise	2,024	263	283	2,570	78.8	10.2	11.0	100.0
Campania	45,292	7,389	10,732	63,413	71.4	11.7	16.9	100.0
Puglia	29,679	4,869	6,359	40,907	72.6	11.9	15.5	100.0
Basilicata	4,138	702	599	5,439	76.1	12.9	11.0	100.0
Calabria	14,273	1,993	2,604	18,870	75.6	10.6	13.8	100.0
Sicilia	32,062	6,958	9,765	48,785	65.7	14.3	20.0	100.0
Sardegna	7,867	2,966	2,051	12,884	61.1	23.0	15.9	100.0
Total	347,603	73,425	88,699	509,727	68.2	14.4	17.4	100.0

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3.3. Strategy

Our main research interest focuses on the empirical relationship between implicit drop out condition and risk of abandoning upper secondary school before its completion. Thanks to a linking procedure with administrative data, we have identified the students that, five years later, do not attend school anymore. These are all potential candidates to the condition of *Early Leavers from Education and Training* (ELET)[6]. However, we don't have a formal identification of the students who, at the onset (2014), find themselves in implicit drop out (ID) condition; official INVALSI data on ID, in fact, are available since 2019 and only for 13th grade students (INVALSI, 2019).

We tackle this problem in an empirical way, provisionally setting aside more complex theoretical and measurement issues (Desimoni, 2018). Identifying implicit drop out students is a matter of choosing some threshold below which one can assume that fundamental skills have not been achieved by students[7]. In more recent INVALSI data, this is made possible by the identification of levels corresponding to consistent sets of skills of growing complexity. Before the introduction of computer-based test administration (CBT) this ladder-like articulation of scores was not available, therefore some other strategy must be pursued. One might start by observing that, in 2019 13th grade results (for which information about achieved levels is provided), the ID thresholds are set at approximately the 36th percentile of the Italian scores distribution and at the 39th percentile of the Mat scores distribution (Fig. 1)[8].

Italian and Mat scores are correlated among students but residual variation, in both subjects, is not negligible (Fig. 2).

[6] We will discuss this delicate point in the following.

[7] Skills are measured thorough the INVALSI standard scores.

[8] ID students are defined by INVALSI as those who do not reach at least the third level (on a 5-levels-scale) both in Italian and Mat (we set aside English, since foreign language test scores are not available for our cohort of interest). Levels are built by cutting the distribution of scores at points that are determined according to application of psychometric tools (Desimoni, 2018). Here we translate level thresholds into percentiles since levels are not defined for the 2014 8th grade cohort.

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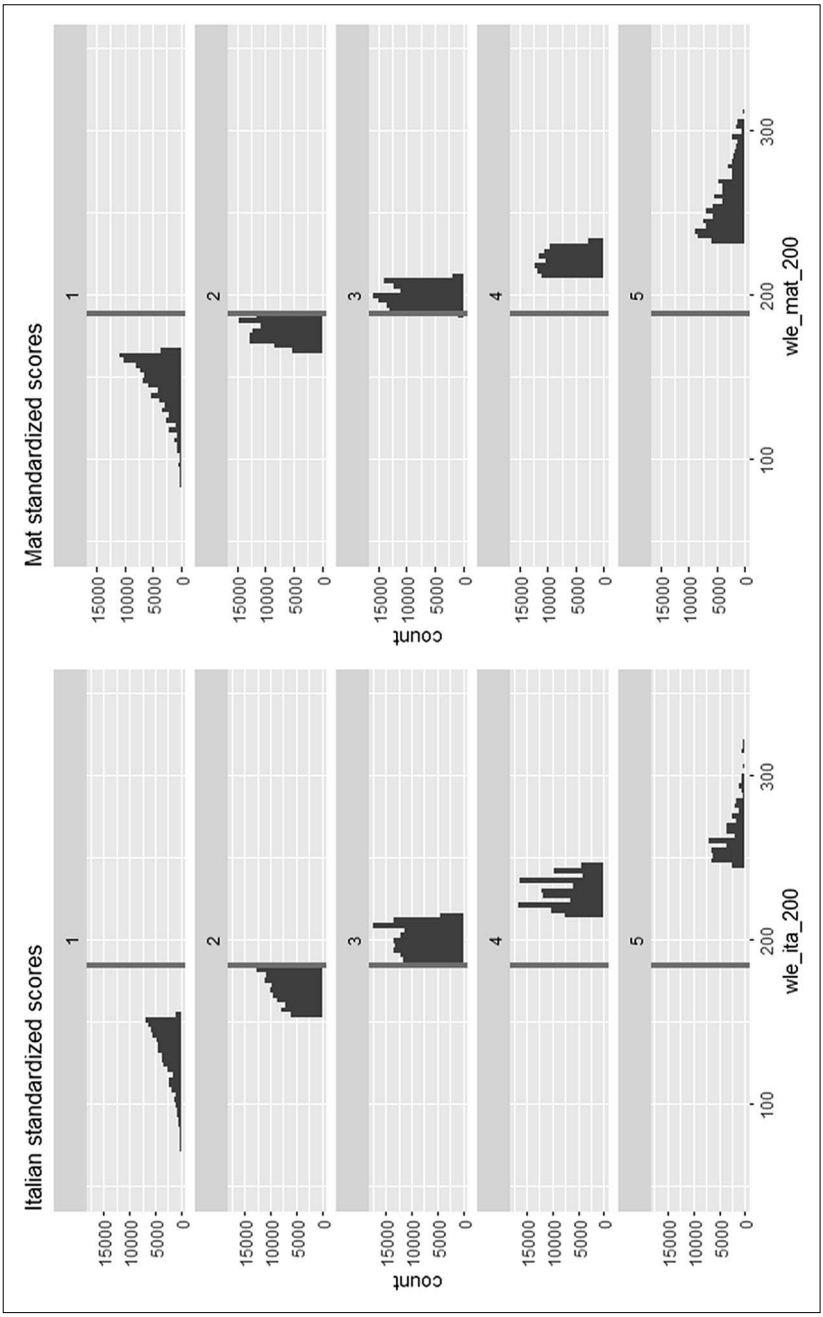

Fig. 1 – INVALSI 2019 13th grade Italian and Mat scores distribution by level (5-levels-scale)

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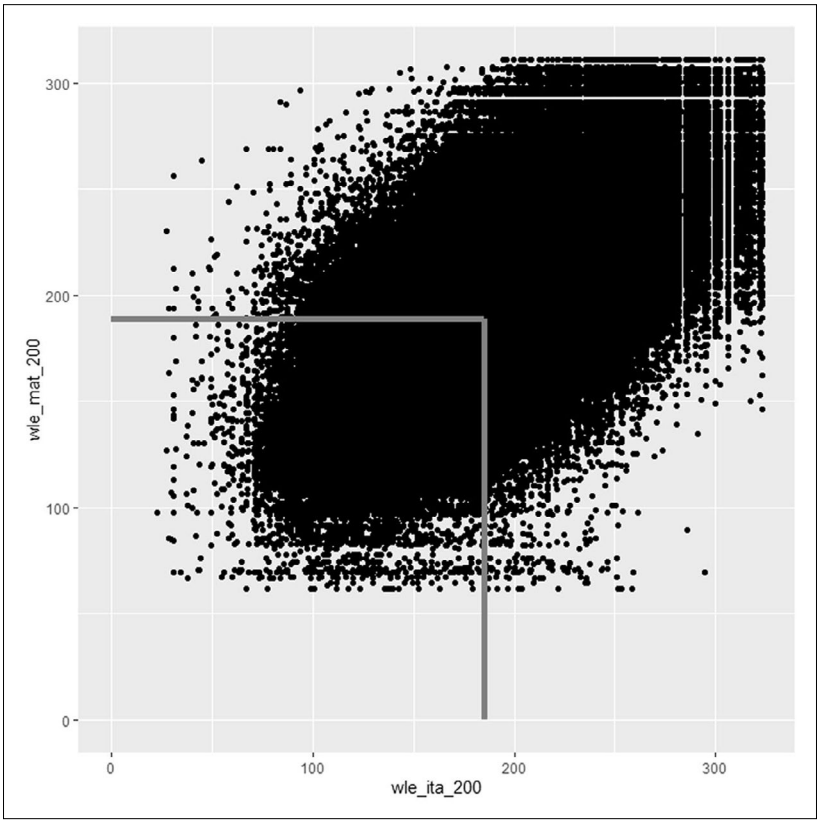

Fig. 2 – Correlation among Italian and Mat INVALSI scores within the 2014 8th grade cohort

Consequently, only 25% of students are jointly below Italian and Mat thresholds and are identified as ID (according to INVALSI definition).

In applying this insight to 2014 8th grade data, one should consider that these two populations differ in many aspects. From a cognitive point of view, we might expect a less spread distribution of skills among the 8th grade students (Foresti and Pennisi, 2007); on the other side, the 2019 13th grade population is likely to be a more selected one, since a certain number of students has already explicitly dropped-out of school (Autorità Garante per l'Infanzia e l'Adolescenza, 2022).

A big advantage of our data is that having identified the final (2019) condition of students in terms of school attendance, we can analyse the relationship between 8th grade INVALSI score and 13th grade risk of being out of school in an empirical way.

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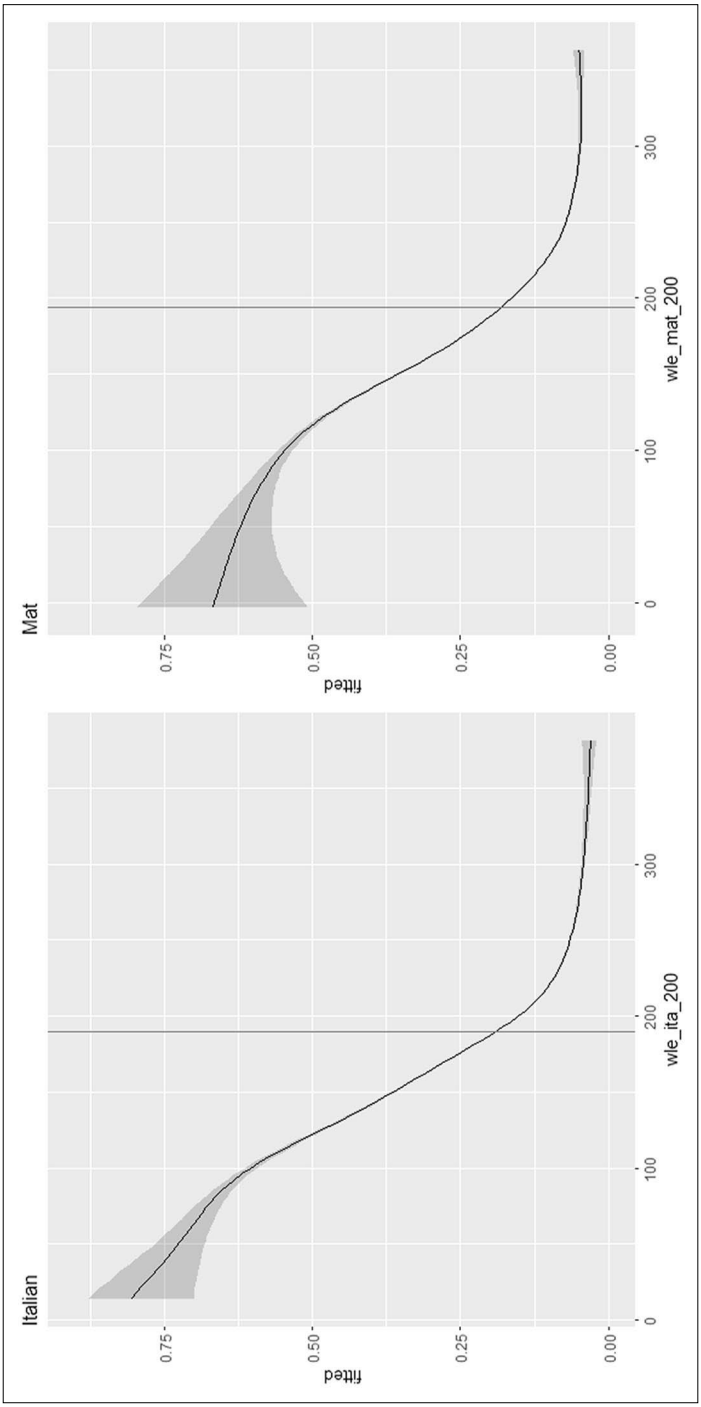

Fig. 3 – Estimated relationship between Italian and Mat 2014 scores and probability of being out of school (OUT) five years later

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We plot the results in graph 3, both for Italian (wle_ita_200) and Mat (wle_mat_200) 8th grade INVALSI scores. The probabilities of being "out of school" in 2019 are estimated using a Generalized Additive Model (GAM) which allows to fit a non-linear curve to the data (Wood, 2017). This is useful to spot discontinuities in the phenomenon[9].

The superimposed vertical lines mark the 2019 13th grade percentile thresholds for the identification of implicit drop outs. It is important to notice that these "exogenous" cuts capture most of the high-risk area. At the same time, it is apparent that the turning point is shifted to the right, a little beyond the mean of the score distributions. Obviously, these results must be confirmed on other students' cohorts and trends should be carefully monitored, in the light of possible discontinuities introduced by the pandemic shock.

However, our empirical findings provisionally suggest that, at least in terms of strategies to contrast explicit school drop out, it makes sense to focus on the existence of skills thresholds which allow to concentrate resources where they are most needed – and where, presumably, there is more room for improvement.

3.4. Analysis

For the purposes of our analysis, we place the threshold below which one can assume the lack of a basic level of skills at the 40th percentile of the 2014 8th grade distribution of scores, both for Italian and Mathematics. Students who jointly do not reach such cut-points are treated as implicit drop outs in the following of the analysis. This is an arbitrary choice but one that we think can be defended on substantive grounds[10]. In the light of the evidence that we have collected, we think that we should be close to the point where the risk profile of students changes dramatically; furthermore, these thresholds are compatible with those used in more recent years by INVALSI to identify implicit drop outs, both at 8th and at 13th school grade[11]. In other words, we

[9] The advantage of a Generalized Additive Model is that it does not impose a predetermined form on the functional relationship between the probability of being out of school and the level of skills (as is the case with Generalized Linear Models). On the contrary, the model allows a certain degree of flexibility – controlled by specific parameters – which can be used to evaluate the presence of any discontinuities or turning points in the trend of the phenomenon. For an introduction to GAM models, see Wood (2017).

[10] Arbitrary in the sense that cutpoints are not based on a rigorous psychometric evaluation of skills as it is the case for official INVALSI data.

[11] For example, ID thresholds for the 2023 8th grade cohort are set by INVALSI at the 39th percentile (Italian) and 43rd (Mat).

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confide that we are using a discrete (dichotomic) category in a context where discreteness makes sense, that is in the presence of a qualitative discontinuity in an otherwise continuous phenomenon. Absolute and percentual number of 2014 reconstructed ID students are reported in Table 3.

Tab. 3 – Reconstructed ID students' distribution for the 8th grade cohort, year 2014

	N.			*%*		
NUTS2 Region	*Others*	*ID*	*Total*	*Others*	*I.D*	*Total*
Abruzzo	7,264	3,739	11,003	66.0	34.0	100.0
Basilicata	3,867	1,572	5,439	71.1	28.9	100.0
Calabria	13,156	5,714	18,870	69.7	30.3	100.0
Campania	42,685	20,728	63,413	67.3	32.7	100.0
Emilia-Romagna	23,635	11,117	34,752	68.0	32.0	100.0
Friuli-Venezia	6,731	2,402	9,133	73.7	26.3	100.0
Lazio	33,948	13,345	47,293	71.8	28.2	100.0
Liguria	7,576	3,462	11,038	68.6	31.4	100.0
Lombardia	56,347	23,722	80,069	70.4	29.6	100.0
Marche	8,719	3,744	12,463	70.0	30.0	100.0
Molise	1,869	701	2,570	72.7	27.3	100.0
Piemonte	22,917	10,494	33,411	68.6	31.4	100.0
Puglia	29,131	11,776	40,907	71.2	28.8	100.0
Sardegna	7,940	4,944	12,884	61.6	38.4	100.0
Sicilia	35,675	13,110	48,785	73.1	26.9	100.0
Toscana	20,027	8,591	28,618	70.0	30.0	100.0
Umbria	4,627	2,154	6,781	68.2	31.8	100.0
Veneto	29,632	12,666	42,298	70.1	29.9	100.0
Total	355,746	153,981	509,727	69.8	30.2	100.0

We are getting closer to the core of our analysis which consists in assessing how strong it is the correlation between implicit drop out condition, measured at a relatively early stage of students' career, and ELET outcome. Correlation does not mean causation (Pearl, 2009) but it provides valuable information that can be exploited to identify students who are most at risk of quitting their studies.

In Figure 4, probabilities of being out of school five years after taking INVALSI 8th grade tests are plotted for ID students and for the others (non-ID students). It can be noticed that the former has a risk profile that is thrice as much that of the latter.

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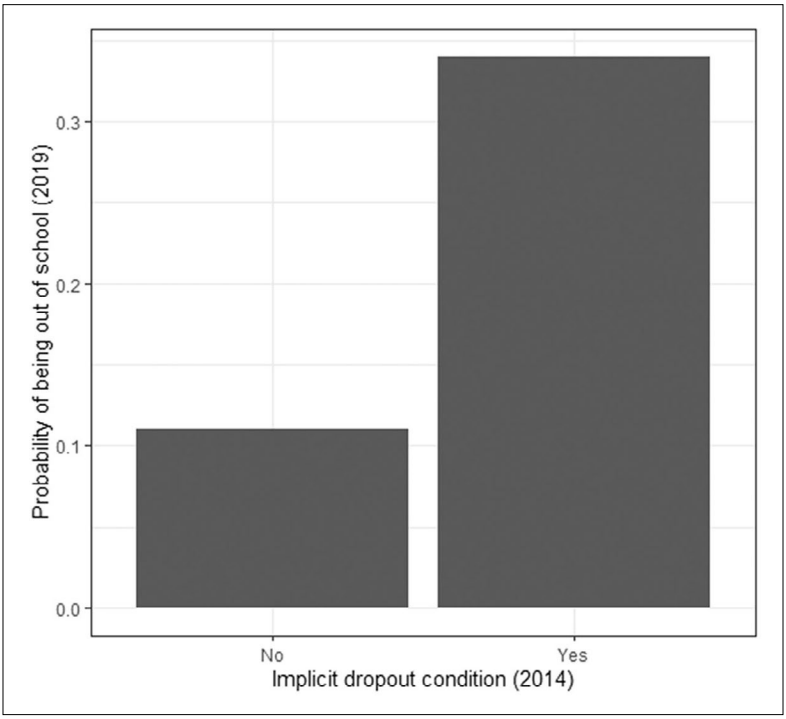

Fig. 4 – Probability of being out of school five years late (2019) by ID condition at the onset (2014)

Even more interestingly, the out-of-school average risk of ID students is highly spread across NUTS2 regions, being particularly relevant in the North Est areas of the Country (Figure 5, detailed in Figure 6).

To make an example, in Lombardia one student in ID condition out of two is not enrolled in school five years later, versus one out of four in Marche and one out of five in Basilicata.

These results suggest that the predictive utility of ID identification is much higher in the North than in the South of Italy (with the notable exception of Sicily). Whereas confirmed, such a result is not a trivial observation but, rather, something that requires an explanation.

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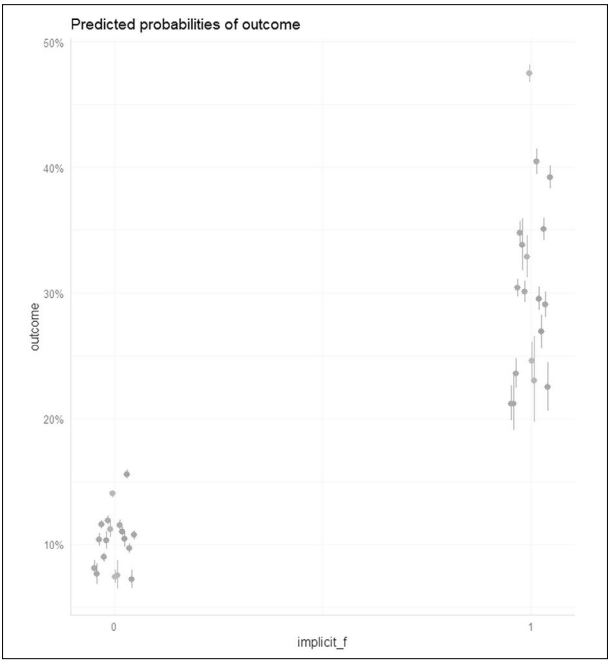

Fig. 5 – Probability of being out of school five years late (2019) by ID condition at the onset (2014) broken down by region

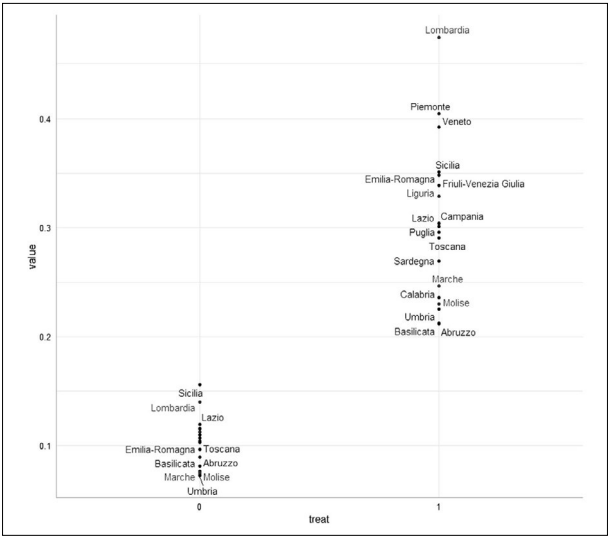

Fig. 6 – Probability of being out of school five years late (2019) by ID condition at the onset (2014) broken down by region (detailed)

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3.4. What proxy means

It's time to address the elephant in the room and ask ourselves what it means not being enrolled in a school five years later.

These students are no longer within the scope of our observable sample. But one can slip out of view in many ways. Moving abroad is one possibility. Students who have left Italy may or may not have abandoned their studies. In any case, they should be removed from ELET statistics.

Having shifted to vocational training tracks not managed by schools is another possibility. Vocational training supplied by private agencies is widespread in some areas of the Country (ISTAT, 2023). These organizations are usually publicly funded and issue titles that are recognized by Regional and Statal authorities. In any case, people who achieve a VT qualification meeting some basic criteria are not counted as ELET (Early Leavers from Education or Training) in official statistics (Eurostat, 2023); likewise, according to Italian laws they have fulfilled their minimum educational duties. These people should not be treated like those who have totally quitted any educational effort. In other words, we should be rather interested in students who have gave up studying before achieving a diploma or an alternative VT qualification (ELET) than in students who in a broader sense have "dropped" out of school.

Measuring or, at least, estimating these groups is a necessary step to answer questions on the usefulness and predictive value of implicit dispersion – and, more generally, of any indicator that seeks to profile the risk of educational failure of students.

In her last National Report (2023), INVALSI tried to reconstruct the current situation of the cohort of students who took 8th grade tests in 2018 (INVALSI, 2023). This entails trying to estimate the number of students who moved abroad in the following years and the number of those who traded school for (non-school) VT attendance. Here we refer to a further development of that research which supplies estimates broken down by NUTS2 region (Table 4).

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Tab. 4 – 2018 8th grade students' cohort by 2023 educational status

NUTS2	*Regular*	*Repeaters*	*ELET*	*Emigrated*	*VT (out of school)*	*Total*
Piemonte	68.7	12.6	9.2	1.2	8.3	100.0
Lombardia	64.6	12.3	8.7	1.4	13.1	100.0
Veneto	68.7	12.5	8.0	1.4	9.5	100.0
Friuli-Venezia	70.0	14.3	8.6	1.3	6.2	100.0
Liguria	71.1	13.9	6.4	0.8	7.9	100.0
Emilia-Romagna	71.1	14.0	6.5	0.3	8.0	100.0
Toscana	73.2	14.3	9.3	0.9	2.7	100.0
Umbria	83.4	7.6	7.6	1.1	0.2	100.0
Marche	79.8	10.5	7.4	1.1	1.2	100.0
Lazio	77.8	9.9	6.4	0.7	5.2	100.0
Abruzzo	80.7	9.5	6.2	0.6	3.0	100.0
Molise	81.3	9.5	4.9	1.3	3.0	100.0
Campania	77.4	9.7	13.3	1.4	-0.5	100.0
Puglia	78.5	9.2	11.4	0.5	0.4	100.0
Basilicata	82.8	9.2	7.1	0.8	0.7	100.0
Calabria	80.9	9.0	8.6	0.8	0.7	100.0
Sicilia	71.3	10.8	15.8	0.4	1.7	100.0
Sardegna	68.4	18.8	6.7	0.8	5.7	100.0
Totale	72.7	11.6	9.3	1.0	5.5	100.0

Source: INVALSI (2023)

Such a reconstruction, obtained by combining different statistical and administrative sources[12], shows some interesting elements. The first one is that the impact of emigration tends to be low (about 1%) in all regions[13]. The second is that the role played by VT varies greatly by region, ranging from about 10% in Piemonte, Lombardia and Veneto to almost zero in the South of Italy.

Caution is needed due to the experimental nature of estimates; however, these results suggest that while in some regions we can take the percentage of students who are not enrolled in schools at its face value, as a good proxy of true educational drop out (Early leaving from education and training), in others such a figure tends to be inflated because of the role played by private (not administered by schools) Vocational Training. In such cases we would like to know whether ID condition is equally predictive of true ELET out-

[12] For a description of the methodology, we refer the reader to INVALSI (2023).

[13] For this reason, in the following we set aside migration and focus instead on the Vocational Training component that varies substantially across regions.

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come[14]. It is worth to observe that regions for which such a dilemma holds the most are also those with the strongest association between ID condition and absence from administrative records (Lombardia, Veneto, Piemonte).

3.5. A simulation approach

Since we cannot directly observe those who are in true ELET condition, we address such relevant question through simulation.

More specifically, we simulate a population of approximately the same size of Lombardia's empirical 2014 students' cohort (80,000 units). We pick Lombardia since it is the region where VT is more widespread and, at the same time, the predictive power of ID is potentially stronger[15]. Students have skills that are measured on a standardized scale; for sake of simplicity, we assume a single relevant type of skill which is distributed normally in the sample with mean zero and standard deviation of 40[16]. We fix the proportion of students who cannot be found in a hypothetical school attendance registry five years after skills have been measured at 25% (the empirical level observed in Lombardia). We determine the units' condition with reference to the 5-years-later school attendance condition through draws from a Bernoulli distribution, with probability of extraction negatively correlated for each student to her skills score[17]. In practice, the lower the skills, the higher the probability of not appearing in the registry. The crucial step is to establish who, among those who no longer attend school, is enrolled in a vocational training course and who, instead, has actually abandoned her studies To keep our model relatively simple, we assume that the probability of attending VT is someway significantly associated with the student's skills[18].

[14] To be noticed that Students in true ELET condition (not in Education or Training) are a subset of students not enrolled.

[15] According to our empirical findings.

[16] This is approximately the empirical distribution of Lombardia's students score, both in Italian and Mat; we centre the mean at zero to facilitate estimation and interpretation of parameters.

[17] More precisely we assume that the logit of showing up is a linear function of skills, plus some Bernoulli distributed error. The linear parameters (intercept and slope) are estimated from Lombardia's empirical 2014 students' population through the model: *logit(out) = a + b*wle_ita_200*, where out is a binary variable indexing the circumstance of not showing up in Anagrafe and wle_ita_200 is INVALSI 2014 standardized Italian score.

[18] Since we are manipulating a dichotomic condition (VT or ELET) with only one degree of freedom, this is the same as saying that being an ELET is associated to skills (within the subpopulation of students not showing up in Anagrafe).

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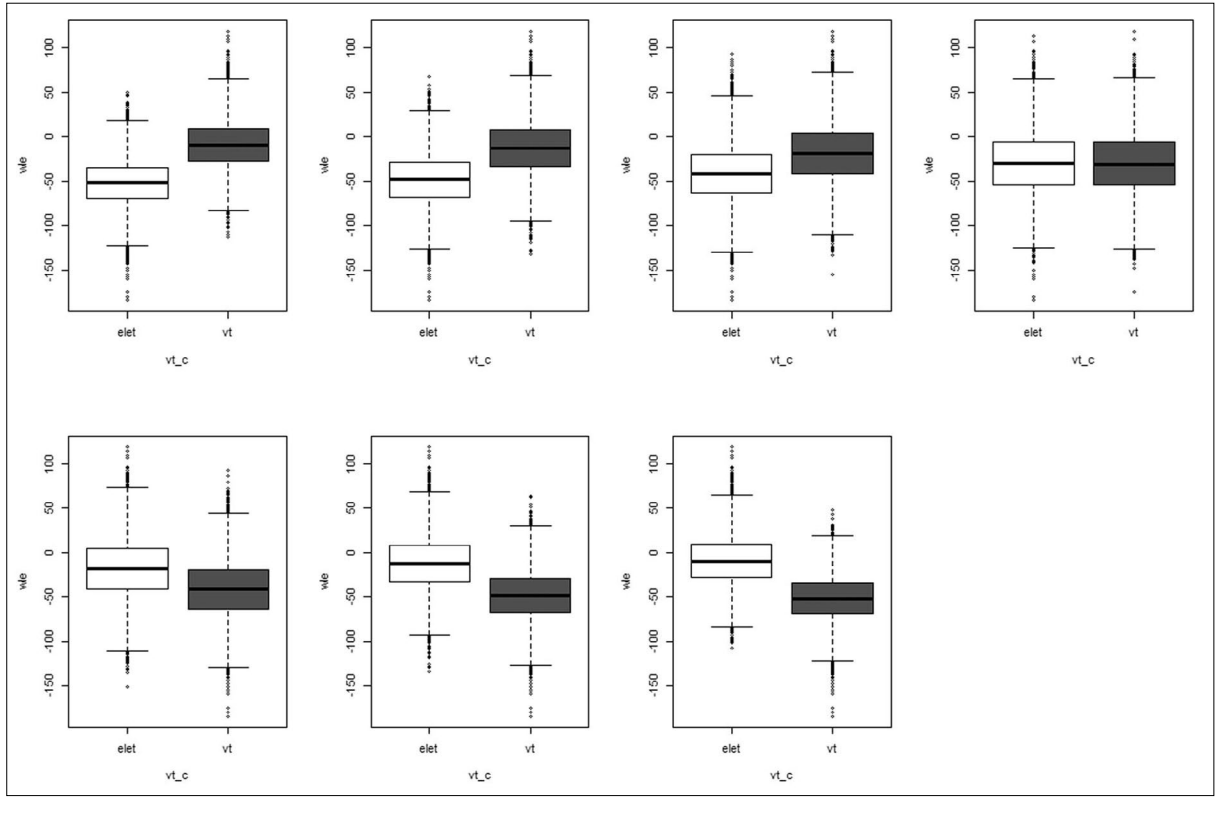

Fig. 7 – Associations between skills and ELET/VT condition in the seven syntethic sub-populations of students not enrolled in school after five years (1-3: positive association between skills and VT; 4: neutral association; 5-7: negative association)

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In this regard, we consider seven different scenarios:

- three of them where VT probability is positively correlated with individual skills, varying the intensity of association from stronger to milder[19];
- three of them where VT probability is negatively correlated with individual skills, varying intensity as well[20];
- the last one where the two features are uncorrelated.

The different intensities and directions of association between skills (wle) and outcomes (ELET/VT) in the seven simulated scenarios are represented in Figure 7.

In summary, we end up with seven simulated populations. These synthetic entities share the group of students who are still attending school five years after their skills have been measured, but differ with reference to the distribution of true ELET and vocational trainees within the sub-group of those who do not attend school any more[21].

This yields an identical estimated average difference (0.35) in the probability of not attending school between ID students and others for all seven populations. What varies among scenarios is the average difference in the probability of being a true ELET between ID students and others. This allows to assess whether, and under which circumstances, ID condition identified at an early stage is equally informative about true ELET probability than it is about simply not attending school anymore. The results are shown in Figure 8[22].

In brief, the predictive power of ID condition depends crucially on the circumstance that VT attendance is positively correlated with skills within the group of those who do not attend school anymore. The stronger the positive association, the bigger the utility of an early ID identification even in regions where a lot of non-attenders are false positives with reference to true ELET condition.

On the contrary, this predictive quality tends to shrink to zero in case of strong negative correlation between VT attendance and skills. This hypothesis appears prima facie rather implausible: indeed, and in a sense sadly, it makes more sense to think that, on average, the less skilled have a higher probability of ending as ELET. However, this general statement could be reversed locally, for example in case of positive actions effectively targeted

[19] This means that, on average, the most skilled of those who do not show up attend VT.

[20] Conversely, this means that, on average, the less skilled of not showers attend VT.

[21] In all scenarios we fix the proportion of VT attenders at about one half of the total of non-showers.

[22] For simplicity's sake, we ignore the uncertainty deriving from the sampling variation (which is modest anyway; see the appendix for a demonstration).

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towards highly disadvantaged groups. This point shows the utility of accurate monitoring of process – that especially for VT, tends to be rather scanty.

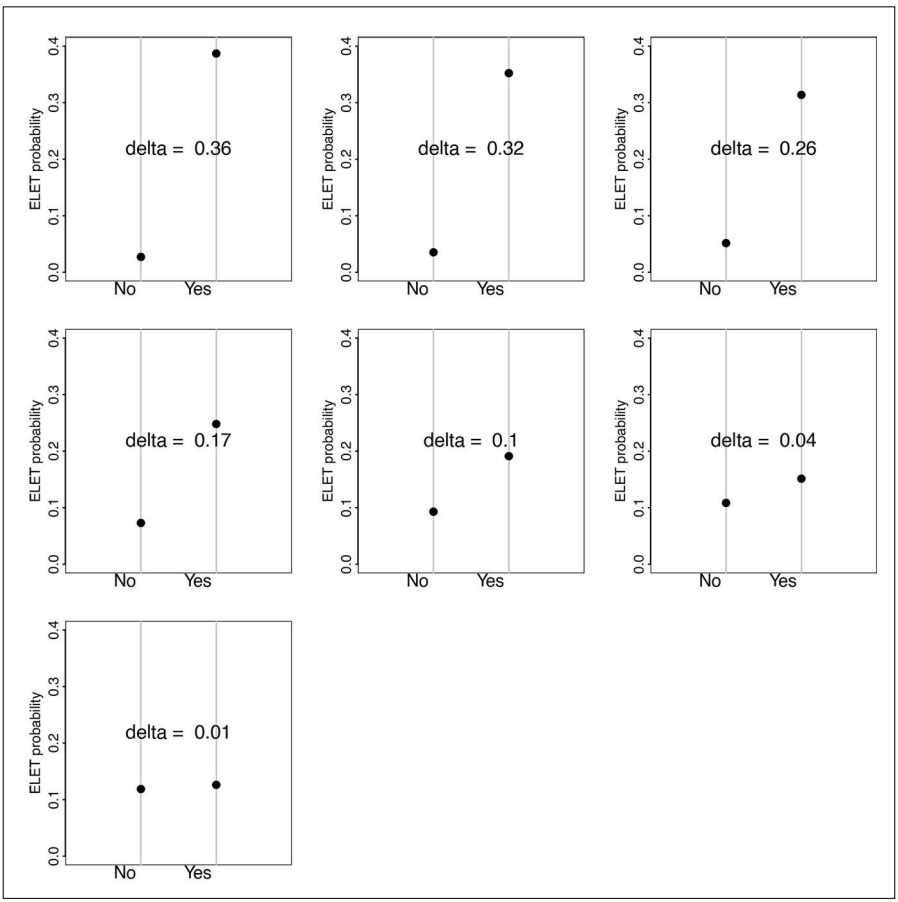

Fig. 8 – Difference in ELET probability between ID students (Yes) and others (No) in seven simulated scenarios (1-3: positive association between skills and VT; 4: neutral association; 5-7: negative association)

5. Conclusions

In this contribution we have discussed some relevant features of the concept of implicit school drop out as it has been proposed by INVALSI. More specifically, we focused on implicit drop out predictive usefulness for identifying students at risk of early leaving from education and training.

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In our analysis we also tried to clarify some terminological issues, distinguishing between those who no longer attend school – a group that can be identified through the student registry – and those who have abandoned any kind of studies (ELET). The latter are a sub-set of the former which, however, cannot be identified with certainty, due to the difficulties in integrating data on school attendance and data on enrolment in vocational training tracks. In this regard, we have observed that from a systemic perspective attention should focus on the global problem of early leaving from education and training, assumed as interruption of any form of accumulation of human capital.

In any case, to have an effective predictive value the condition of implicit drop out should be identified at an early stage of the school career. For this purpose, we have built a proxy of implicit drop out taking the lower percentiles of the joint distribution of Italian and Mathematics skills from INVALSI 8th grade tests.

By exploiting longitudinal information contained in the INVALSI data base, we discovered a strong correlation between implicit drop out condition at the completion of lower secondary school and the circumstance of no longer attending school five years later. Subsequently, through statistical simulations, we showed that ID condition is equally predictive of true ELET condition, as it is of mere absence of registration in school records.

Our investigation, despite its limitations, supports the practical usefulness of the notion of implicit drop out proposed by INVALSI. In this regard, the choice adopted by the Italian Ministry of Education to increase funding of schools with a high rate of ID students appears a sensible one.

We conclude by observing that our analysis should be replicated on other cohorts of students, especially on those affected by the pandemic. This would allow us to better understand the adaptive mechanisms of the school system to the exogenous shock represented by Covid-19. On a more general level, the concept of implicit drop out should be explored in depth on a theoretical level and further empirically investigated. It would be necessary to understand whether and to what extent implicit dispersion tend to be treated by (some or all) actors as a more socially acceptable substitute for explicit dispersion; for example, whether, in the face of national and international pressure to reduce the rate of ELETs, schools are inclined to lower the threshold of skills required from their students (or from the weakest groups of them). This point should be addressed in an objective way, without ideological prejudices, by comparing the social costs of early interrupting any path of human capital accumulation to those of continuing the studies until some sub-optimal outcome.

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In conclusion, we believe that the notion of implicit drop out represents a stimulus for discussion and a useful tool for broadening the understanding of post-Covid school transformations; our contribution tries to provide insights in this regard.

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2. Assessing the educational inclusion of students with a migrant background. Italy and Spain

by Patrizia Rinaldi, Giovanna Filosa

This contribution offers a unique perspective by examining the capabilities and limitations of standardised tests to assess school settings that include students with a migrant background. It does so by focusing on two distinct education systems, the Italian and the Spanish, to delve into the certification and methods of evaluating the educational background of first and/or second generation migrant minors. This unique approach provides a fresh understanding of the educational inclusion of migrant students.

In the Italian case study, the results of the INVALSI tests of pupils with non-Italian citizenship are compared with those of their native peers. The focus is on the differences between 1st and 2nd generation natives and foreigners in the standardised tests of Italian and Mathematics (G8) in the historical series from the 2012/2013 to 2021/2022 school year. This historical series is of paramount importance as it allows us to distinguish, from a descriptive point of view, the effects of Covid-19 on the school inclusion of a particular student target from those due to structural limits of the Italian school system.

In the Spanish case study, we took two types of evaluations: one organised at the national level by the Evaluation Institute that is carried out at the territorial level every three years by the individual Autonomous Community and a diagnostic evaluation at the territorial level delegated to the individual Autonomous Community and carried out annually, focusing the analysis on the comparison of native pupils with pupils of foreign origin. The methodology has been based on analysing the rules of the main Spanish Educational Laws from 2012 to post-pandemic time, together with participant observation, interviews and document analysis.

The evaluation of schools should not only focus on academic performance but also on the inclusivity of the school environment. Our research findings underscore the importance of ensuring schools can guarantee sim-

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ilar performance results for students with Italian and Spanish citizenship and potential "new citizens". This discovery carries significant implications for educational policies, emphasizing the pressing need for inclusive educational practices.

Il presente lavoro, in una prospettiva comparativa, prende in esame due sistemi scolastici, quello italiano e quello spagnolo, per concentrarsi sulla certificazione e sui metodi di valutazione del background educativo dei minori migranti di prima e/o seconda generazione. In Italia, i risultati delle prove INVALSI degli alunni con cittadinanza non italiana vengono confrontati con quelli dei loro coetanei autoctoni. In particolare, verranno esaminate le differenze tra autoctoni e stranieri di prima e seconda generazione nelle prove standardizzate di Italiano e Matematica (G8).

Nel caso spagnolo, abbiamo preso in considerazione due tipi di valutazioni: una organizzata a livello nazionale dall'Istituto di valutazione (Instituto Nacional de Evaluación Educativa – INEE) e realizzata a livello territoriale ogni tre anni dalla singola comunità autonoma e una valutazione diagnostica a livello territoriale delegata alla singola comunità autonoma e realizzata annualmente, concentrando l'analisi sul confronto tra alunni autoctoni e alunni di origine straniera. Questa agenzia combina due strategie: la valutazione generale del sistema e la valutazione diagnostica, entrambe volte a raccogliere informazioni sul sistema educativo valutando le competenze acquisite dagli studenti in relazione al loro contesto socio-economico e familiare.

1. The research puzzle to address

Quality schools are not just a goal of the 2030 Agenda for Sustainable Development; they are a powerful tool in the fight against inequality and poverty in all its dimensions, including education. When used effectively, assessment systems can significantly contribute to this goal, making inclusive education a beacon of hope in our mission.

To close the gaps often highlighted by assessment tests, promoting widespread excellence, identifying bad practices to implement the required corrective interventions, and understanding and applying so-called "intercultural education" would be necessary. Considering that parents' socio-cultural resources are associated with their children's educational outcomes, school evaluation should also consider how inclusive the school is, i.e., how it can guarantee similar outcomes for students with Italian and Spanish citizenship and potential "new citizens".

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This work focuses on children and young people from first and second generation migration backgrounds. Their reasons for migrating may differ, as may their legal status, both of which are highly relevant legal factors compared to their families. The length of their stay in the host country may be short or long, and they may or may not have the right to participate in the country's formal education system (Eurydice, 2019).

While the benefits of education in the host country for the first generation have received much attention in the literature, more needs to be written about how education affects the "life chances" of the second generation. The current debate on education systems within the European Union focuses on evaluating inclusive schools, believing that policies must be evidence-based and ethically oriented for this strategic sector like education. The hypothesis is based on the current school set-up that cannot reduce inequalities between the native component and the component with a migrant background of the student population. The pandemic exacerbated these inequalities, even though they were present before Covid-19.

This paper presents a novel approach to understanding how cultural diversity is problematised in the school context and how differences are assessed in schools. It delves into the capabilities and limitations of standardised tests to assess school contexts that include students with a migrant background. Can the modernisation of education methodologically and infrastructurally overcome this gap?

It aims to determine how cultural diversity is problematised in the school context and how differences are assessed at school. It offers insight into the capabilities and limitations of standardised tests for evaluating school contexts that include students with a migrant background. The focus is on certification and methods for assessing the educational background of first and second generation immigrant children; from a comparative perspective, it looks at two educational systems, Italy and Spain.

In Italy, the INVALSI test results of pupils with non-Italian citizenship are compared with their native peers. The INVALSI National Surveys are now an essential component of the National Assessment System (Freddano and Pastore, 2018) and an essential thermometer to monitor the health of Italian schools. One indicator of this state of health is the reduction of inequalities (Goal 10 of the 2030 Agenda for Sustainable Development).

In the Spanish case study, we considered two types of evaluation: one organised at the national level by the Institute of Evaluation (Instituto Nacional de Evaluación Educativa – INEE) and another at the regional level managed by the Autonomous Communities and Autonomous Cities.

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As mentioned, our work aims to theoretically contribute to the objective of the 2030 Agenda for Sustainable Development:
– reducing inequality and poverty;
– through education;
– by analysing the role of evaluation.

Our research deals with the educational poverty (Giancola and Salmieri, 2023) of children with a first- and second generation migration background. The concept of *educational poverty* was born in the social sciences at the end of the 90s, as one of the non-strictly economic dimensions of poverty (Nanni and Pellegrino, 2018). However, at present, there is still no universally shared definition on this concept (Battilocchi, 2020): for Save the Children (2014), educational poverty is the «deprivation, by children and adolescents, of the possibility of learning, experimenting, developing and allowing their skills, talents and aspirations to flourish freely» (p. 4).

The educational poverty of children with a migrant background is a complex problem that can be analysed through several key concepts, including integration, exclusion, citizenship and deviance (García Castaño *et al.*, 2008). Here is how these concepts can be related to the context of educational poverty of migrant minors in the Spanish case study (but can also be extended to the Italian case). Educational poverty excludes the whole child approach, where emotional and social development are absent:

1) *integration*:
   – positive aspect: integration refers to the adaptation and inclusion of migrant children in the host society, including the education system. Good integration can foster a positive school environment, facilitating learning and active participation;
   – downside: however, the lack of effective integration policies may lead to marginalisation and discrimination, contributing to educational poverty. Linguistic, cultural and social barriers may hinder migrant children's involvement in the education system;
2) *inclusion/exclusion*:
   – positive aspect: inclusion is fundamental to tackling educational poverty. Ensuring that all children, regardless of their migration background, have access to educational resources and opportunities can help reduce exclusion (Franzé Mudanó, 2003);
   – downside: exclusion can occur when migrant children are subject to discrimination, prejudice or policies that limit their access to education. This can lead to educational inequalities and poverty (García Castaño *et al.*, 2011);

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3) *citizenship*:
   – positive aspect: promoting a sense of citizenship among migrant children can foster an inclusive school environment. Recognising and respecting cultural and linguistic diversity contributes to building aware and participative citizenship (Labussière, 2023);
   – downside: the lack of recognition of migrant children's rights and identities can lead to a feeling of alienation, contributing to educational poverty. Limited access to civil rights can negatively affect their well-being and educational development;
4) *integration/deviance*:
   – positive aspect: preventing deviance is linked to providing meaningful educational opportunities. A positive and inclusive school environment can reduce the likelihood of migrant children engaging in deviant behaviour;
   – negative aspect: lack of educational opportunities and support can increase migrant children's vulnerability to deviance, with consequent negative impacts on their educational and social lives. The most significant phenomenon is school drop out.

Addressing the educational poverty of migrant children requires a comprehensive approach that addresses these aspects in an integrated manner, promoting an educational environment that is open, inclusive and respectful of diversity.

The first and most crucial factor addressed in this study is the slow and progressive decline in birth rates, which makes Italy and Spain vulnerable to demographic decline. The dimensions of this phenomenon are essential not only because of the demographic decline but also because of its magnitude.

Secondly, the study aims to compare these two countries, the southern border of the European Union, with historical and cultural similarities. Specifically, it examines how the educational systems in Italy and Spain can create barriers to integration and increase the risk of dropping out of school.

2. The empirical design of the study

The methodology is based on analysing the central Spanish educational norms and laws from 2012 to the post-pandemic period, utilising participant observation, interviews, and an analysis of documents and data produced by the respective educational system evaluation institutes. To this end, the INVALSI tests are compared with the INEE tests. Sample data from the INVALSI standardised tests, available from the 2012/2013 school year to

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2022/2023[1], were used, focusing on the gaps between first and second generation students compared to Italian students. The INVALSI data are treated from a descriptive point of view to explore the differences in the average INVALSI standardised scores in Italian and Mathematics between Italian students and first and second generation foreign students.

Although the gaps between Italian and foreign students are evident from grade II of primary school and remain until the last year of secondary school, for the sake of synthesis, we will only examine the results relating to grade 8 (grade III secondary school) in Italy because the first cycle of education comes to an end. We are moving towards a differentiated pathway between vocational and high school paths.

The comparison between the evaluated systems of the two countries may appear asymmetrical due to their different approaches to data collection. The National Institute for Educational Evaluation began its activities in 1990, when it was known as the INCE (National Institute of Educational Quality). It acquired its current name in 2012. The INEE is part of the Ministry's Directorate General for Evaluation and Territorial Cooperation of the Ministry of Education, Training and Sport. The collection of data falls within the framework of the evaluation, which utilises Cognitive Questionnaires and Contextual Questionnaires.

The INEE tests are administered randomly to pupils at the end of the fourth year of primary school (approximately 10 years of age) and the end of the second year of lower secondary school (approximately 14 years of age). The subjects covered, in turn, the eight basic skills of the curriculum. The evaluation using these questionnaires results from the combination of knowledge, skills and activities. Specifically, the tests comprise questions and items that require the activation of competence involving higher cognitive processes, such as understanding, analysing, synthesising, and drawing conclusions.

For internal consistency in this document, we will examine the equivalent subjects in the Italian case: Spanish and mathematics. The results of the general evaluations of the Spanish education system are intended to guide innovation processes and efforts to review and improve education throughout the system. The tables and databases comprise the online archive, and the data can be provided, upon request, in Excel, Stata, and SPSS formats. In summary, we could say that it is a mixed system of a qualitative nature, which nevertheless features an accessible database with assessments categorised by subject and age group.

[1] https://invalsi-serviziostatistico.cineca.it/.

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Italian and Spanish are «languages of instruction» according to Eurydice's definition (2019).

To make a comparative analysis, the following aspects will be analysed:
- treatment of assessment;
- characteristics of assessment;
- promotion, qualification;
- other significant differences;
- conclusions and food for thought.

3. The Italian context[2]

Students of foreign origin represent a consistently growing reality in Italian schools, except for the slight decrease suffered during the Covid year. According to data from the Ministry of Education's National Student Registry Office, updated to 31/8/2023[3], out of a total of 7,946,930 students enrolled in State and paritarian schools of all levels (excluding Val d'Aosta and Trentino-Alto Adige), we had 894,624 students with non-Italian citizenship, (10.6% according to the IDOS 2023 report updated to the 2021/2022 school year) distributed mainly in the central and northern regions.

According to the Report on Integration Indicators of Citizens with a migratory background resident in Italy (INAPP, 2023), foreign citizens have, on average, a lower level of education than natives: 41.2% of those born abroad have a low level of education (Isced 0-2) compared to 31.3% of those born in Italy (ISTAT data, Continuous Survey on Labour Forces – RCFL, year 2020). More significant delays[4] in schooling accompany this: 27% among those born abroad compared to 1.1% of those born in Italy in grade 5, 42.1% and 4% in grade 8, and 55.6% and 16.7% in grade 13, respectively. All this translates into a higher risk of dropping out and dispersion[5], especially if there are differences in origin, especially when differences in origin are compounded by social class and family cultural capital (INAPP, 2023).

[2] For an explanation of the structure of the Italian educational systems see https://national-policies.eacea.ec.europa.eu/youthwiki/chapters/italy/61-general-context (last visit: 21/3/2025).

[3] https://dati.istruzione.it/espscu/index.html?area=anagStu (last visit: 29/3/2024).

[4] Educational backwardness is the rate of students one or more years older than the reference class out of the total number of students in the same reference class (source: INVALSI data, *National Learning Surveys*, s.y. 2020-2021).

[5] The Elet (*Early leavers from education and training*) rate in Italy is 10.1 per cent for natives, 26.1 per cent for first generations and 15.3 per cent for second generations (Inapp elaborations on RCFL 2020 data).

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The complex interaction between results on standardised tests (PISA, 2018) of young people with a migrant background, language spoken at home, and socio-economic and cultural variables (ESCS) has also been analysed with robust econometric techniques in Ferri *et al.* (2023, 2024).

Therefore, the National Observatory for the Integration of Foreign Pupils and Intercultural Education (Osservatorio nazionale per l'integrazione degli alunni stranieri e l'educazione interculturale, 2022) recommends the removal of linguistic, cultural and socio-economic barriers to ensure that all students have the same opportunities for learning and development. The inclusion of this target group of students is important for several reasons. Firstly, students from immigrant families often face additional challenges compared to their peers. These may include the language barrier, adaptation to a new culture and the socio-economic gap. Moreover, these students may be subject to prejudice and discrimination from their classmates and school staff. Finally, these potential "new Italians" are to be considered a resource for our school system, all the more important in that our proclaimed demographic winter (Fig. 1) requires that this wealth be exploited and not dispersed, with appropriate inclusion actions that also involve the third sector and educating communities (Filosa and Gamberoni, 2023).

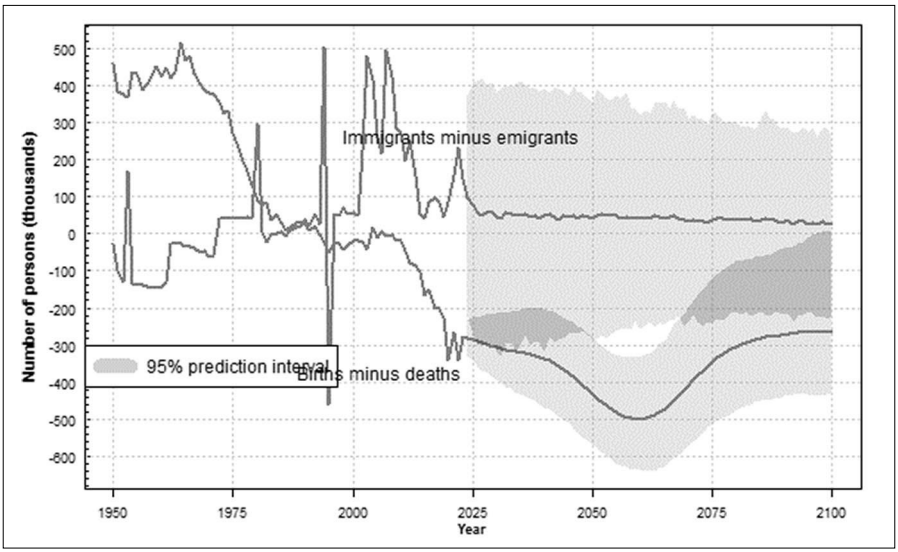

Fig. 1 – The migration balance in Italy, historical series and future projections 1950-2100

Source: https://population.un.org/wpp/graphs?loc=380&type=Demographic%20Profiles&category=Line%20Charts (last visit: 21/3/2025)

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The legislative path towards school integration begins with Law No. 517/77, which represents the model of school integration for pupils with disabilities in our country's tradition: a project that continues to arouse interest on the international scene. This principle is reinforced by Law 104/92, which recognises and protects the participation of people with disabilities in social life, particularly in the places that are fundamental to it: school during childhood and adolescence, and work in adulthood. The year 2016 saw the introduction of the reform known as the Good School ("la Buona Scuola"), formalised by Law 107 of 2015. This legislation mainly aimed to fully realise the autonomy of educational institutions, as Article 21 of Law No. 59/1997 had promised. As far as integration is concerned, the student curriculum was introduced with the customisation of education.

As regards the protection of the right of access to school for foreign minors, it finds its normative source in Law No. 40 of 6 March 1998 "Immigration regulations and rules on the condition of foreigners", and in Legislative Decree No. 286 of 25 July 1998 "Consolidated text of the provisions concerning the regulation of immigration and rules on the condition of foreigners" which brings together and orders interventions in favor of the reception and integration of immigrants, paying particular attention to school integration. In particular, the latter, in art. 38, establishes that foreign minors present in the national territory are subject to compulsory schooling and that all the provisions in force on the right to education, access to educational services, and participation in the life of the school community apply to them.

Law no. 189 of 30 July 2002 "Amendment to the legislation on immigration and asylum" (so-called "Amendment to the legislation on immigration and asylum"). Bossi-Fini Law confirmed the procedures for welcoming foreign pupils to school.

Presidential Decree no. 275 of 8 March 1999 "Regulation containing rules on the autonomy of educational institutions" represents one of the main tools for dealing with the integration of foreigners, with the provision for the construction of specific and appropriate solutions.

Legislative Decree No. 76 of 15 April 2005 "Definition of the general rules on the right and duty to education and training", in taking up and expanding the concept of compulsory education (Article 68 of Law No. 144 of 17 May 1999), identifies the recipients as «everyone, including foreign minors present in the territory of the State» (paragraph 6 of Article 1).

According to art. 45 of the Immigration Regulation (Presidential Decree no. 394 of 1999), foreign minors have the right to education – regardless of the regularity of their position – in the forms and ways provided for Italian citizens. Enrolment can be requested at any time of the school year. As far

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as integration is concerned, the same Article 45 provides that minors are enrolled in the class corresponding to their age, unless the teachers' board decides to enroll in a different class, after analysing the course of study followed, the level of preparation achieved and the system of studies of the country of origin. The competence of the teachers' board also extends to the personalization of integration programs, through the preparation of individualized or group plans that include, among other things, the facilitation of the learning of the Italian language. The enhancement of the study of Italian can also be achieved through intensive courses activated based on specific projects.

Law no. 107 of 13 July 2015 on "Reform of the national system of education and training and delegation for the reorganization of current legislative provisions" has included literacy and the improvement of Italian as a second language among the objectives of strengthening the educational offer through courses and workshops for students of citizenship or non-Italian language, to be organized also in collaboration with local authorities and the third sector, with the support of communities of origin, families and cultural mediators (article 1, paragraph 7, letter r). It also provided that school guidance activities and projects must be developed in a manner that is also suitable for supporting any difficulties and problems of students of foreign origin (art. 1, par. 32).

The 2016/2019 National Plan for the in-service training of teachers, school principals and ATA staff adopted by Ministerial Decree no. 797 of 19 October 2016, believing that the quality and results of the school integration of students with a foreign background depend to a large extent on the professional skills of teachers and managers of multicultural schools, reiterated that «integration and global citizenship skills» must be priorities National. Therefore, teacher training, in addition to being enriched with content concerning education to interculturality and global citizenship, must increase professional sensitivity regarding reception, peer education, educational and professional guidance and must support the effectiveness of relations between schools and foreign families.

The "Guidelines for the reception and integration of foreign pupils" issued by the Ministry of Education in February 2014 updated the previous 2006 Guidelines and proposed operational indications and models of "integrative" teaching already tested in some schools.

The "2017 Guidelines for the right to education of pupils outside the family of origin" also contain concrete indications on all aspects related to these situations, from the management of the class and relations between students, to the practical and administrative aspects relating to enrolment in school and

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the implementation of the course of study: Inclusion in the classroom, documentation of the school path, school orientation and job placement paths.

It is also recognized the possibility for teachers to draw up personalized paths or, in the case of disability, Individual Educational Plans (IEPs), which enhance resilience and multilingualism. The methodology used for the preparation of these educational paths must be, like the assessment, flexible and individualized.

In continuity with the Guidelines, the National Observatory for the Integration of Foreign Pupils and for Intercultural Education (an advisory body of the Ministry of Education), has recently drawn up the aforementioned document "Intercultural Guidelines. Ideas and proposals for the integration of pupils and pupils from migrant backgrounds" (2022). This document provides various operational indications aimed at operators of Regional School Offices, School Principals and teachers, in an intercultural perspective. These indications pay particular attention to school guidance and reorientation services, to the redevelopment of the training offer of the Provincial Centers for Adult Education (CPIA), to the reception of newly arrived pupils both in terms of administrative-managerial and affective-relational aspects. Teaching Italian as L2 is of crucial importance; support for networks between schools, adult education centers, educational centers and associations; the training of school principals and teaching and non-teaching staff of schools and CPIAs.

4. The Spanish contest

The Spanish education system is divided into several stages: infant education, primary education, compulsory secondary education (ESO), and post-compulsory education, including *bachillerato* and vocational training.

Over the last two decades, the presence of foreign pupils in Spanish schools has become a significant and diverse reality. Spain has seen an increase in the number of foreign students in the school system in recent years, partly due to migratory flows and asylum seekers (De Miguel-Luken and Solana-Solana, 2016). Spanish law establishes the right to education for all students, regardless of their migration status (Franzé Mudanó, 2003).

However, specific policies and initiatives may vary between Spanish regions, as the education system is partly decentralised. Nevertheless, some common key points on the presence of foreign pupils in Spanish schools include:

– right to education: foreign students, including those who do not have a regular status in Spain, have the right to education. This principle is en-

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shrined in Spanish legislation, ensuring all students have access to basic education;
- reception and integration programmes: Spanish schools often implement specific programmes to foster the integration of foreign students. These programmes may include Spanish language courses for non-native speakers, additional educational support and initiatives to promote intercultural understanding;
- linguistic diversity: depending on the region, there may be significant linguistic diversity. Some regions, such as Catalonia or the Basque Country, may have students whose mother tongue is not Spanish. In these cases, schools may offer instruction in different languages (Eurydice, 2023);
- intercultural education programs: some schools promote intercultural awareness among students, encouraging understanding and respect for different traditions and cultural origins;
- challenges and opportunities: foreign students may face specific challenges like language and cultural barriers. However, their presence also offers opportunities for cultural diversification and enrichment of the school environment;
- specific policies and initiatives may vary between Spanish regions, as the education system is partly decentralised (Rubio Gómez *et al.*, 2019).

In recent years, Spain has faced several reforms in the education sector, aiming to improve the quality of education and adapt to the needs of the labour market. Some of the reforms include:
- *Ley Orgánica de Calidad de la Educación* (LOCE) of 2002. Among its innovations are the implementation of different educational itineraries in secondary school and the baccalaureate, a re-evaluation test at the end of the baccalaureate, the theme of computable religion, and some changes in the educational curricula in pre-school;
- *Ley Orgánica de Educación* (LOE) of 2006. It protected the teachings common to all Autonomous Communities. Its main controversies were in Citizenship Education and in maintaining Religion as a compulsory offering in the centres but optional for students. It also instituted a new system of evaluation and quality of education;
- *Ley Orgánica para la Mejora de la Calidad Educativa* (LOMCE) of 2013. This organic law was introduced in 2013 by the Partido Popular government. It has provoked debate and criticism from different sectors of Spanish society, with objections regarding its emphasis on standardisation, greater autonomy for public schools and reduced resources for public education;
- *Ley Orgánica de Modificación de la LOE* (LOMLOE) of 2020, amending Organic Law 2/2006, 3 May. This law is characterised by the elimina-

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tion of Spanish as a language of instruction, the obligation for ordinary schools to implement the necessary means to enrol special education students within a ten-year period, and the non-compulsory inclusion of the subject of Ethics in the fourth year of secondary education.

Organic Law 3/2020 proposes two types of education system evaluation: general system evaluation and diagnostic evaluation. Both types of evaluation gather information on the educational system by assessing the skills acquired by students regarding their socio-economic and family context.

The assessment consists of the general evaluation of the educational system (Evaluación General del Sistema Educativo) and the diagnostic evaluation (Evaluación de Diagnóstico).

5. Findings: Italy

The results of the INVALSI 2023 tests describe the learning outcomes achieved by around 2.7 million Italian students and give us an insight into the health of our school system[6]. In particular, the latest tests involved more than one million pupils in classes 2nd and 5th of primary school, around 570,000 in grade III secondary school, and more than one million in the second and final year of secondary school.

Consulting the data on Tableau[7] allows any actor or stakeholder in the Italian school system to have an overview of the latest INVALSI test results, broken down by grade (from 2 to 13), type of test (Italian, Mathematics, English Listening and Reading), and group of affiliation (gender, origin, ESCS level, etc.).

Focusing in particular on the results of natives and foreigners at grade 8 (Fig. 2), the differences, especially of first-generation immigrants, compared to students with Italian citizenship and the national average, appear evident, especially in Italian. These differences diminish to the point of reversing to the advantage of second generation students in English listening. These gaps reflect those observed in previous surveys in all grades (Filosa, 2022).

[6] https://www.invalsiopen.it/risultati/risultati-prove-invalsi-2023/.

[7] https://public.tableau.com/app/profile/invalsi/viz/RAPPORTO2022-2023-Grado8-Grado13/INIZIO.

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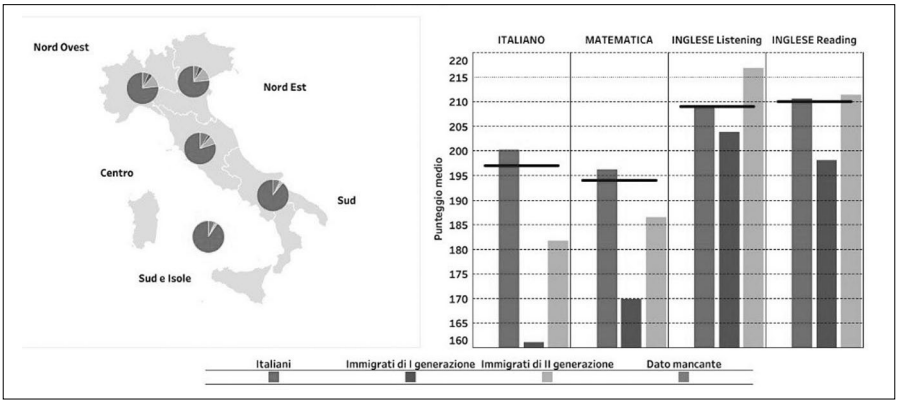

Fig. 2 – The results of natives and foreigners at the INVALSI tests – s.y. 2022/2023, degree 8 (lower secondary education, Isced 2)

Source: INVALSI, https://public.tableau.com/app/profile/invalsi/viz/RAPPORTO2022-2023-Grado8-Grado13/INIZIO

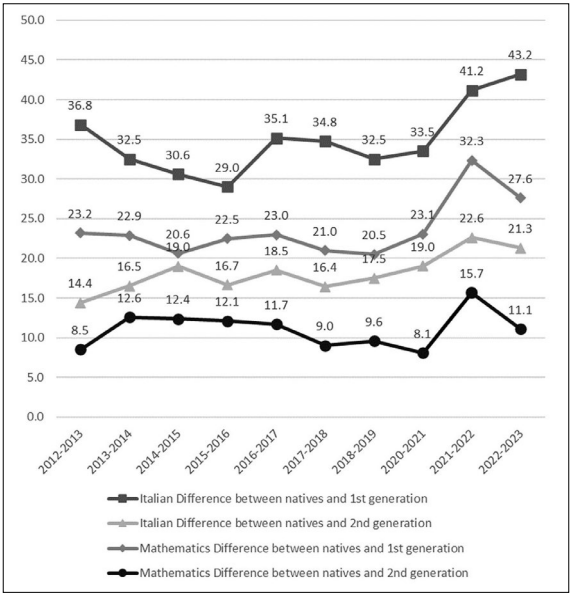

Fig. 3 – Differences between natives, 1st and 2nd generation in the scores of Italian and Mathematic INVALSI Tests – Degree 8 (lower secondary education, Isced 2) – s.y. 2012/2013-2022/2023

Source: INAPP processing on INVALSI data, https://serviziostatistico.invalsi.it/invalsi_ss_data/punteggi-e-percentuale-di-studenti-nei-livelli-di-competenza-per-ripartizioni-territoriali-e-caratteristiche-di-contesto/

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Let us look at the data in a historical series (Fig. 3)[8], starting from the first school year for which comparable INVALSI sample data are available (2012/2013). We can see that the differences between natives and students with migrant backgrounds are structural and not cyclical, and they are mainly concerned with learning Italian. The health emergency has, therefore, also exacerbated gaps that come from afar: differences that, albeit with considerable fluctuations, were already considerable in previous years, especially between Italian pupils and first-generation pupils.

However, the INVALSI results, as standardised tests, do not monitor all the learning that can take place at school but represent a "di cui" of the areas relating to comprehension of a written text (Italian), Mathematics and the receptive aspects of a foreign language (English). Furthermore, the dimension of transversal and citizenship skills, equally crucial for total equity and inclusion, is not represented.

The systematic differences between natives and immigrants may be due to various factors: first of all, gaps in skills in the host country's language, which also have a negative impact on learning mathematics and, presumably, all other curricular subjects, according to the so-called *Matthew effect* (Stanovich, 2000). So much so that these gaps are only attenuated in English listening and reading tests, where second generation immigrants in grade 8 achieve, on average, even higher results than Italian students in English listening.

Secondly, the impact of other contextual factors, including family ESCS level, on standardised test results must be taken into account, an impact that was analysed using Oaxaca-Blinder decomposition by Di Castro *et al.*, (2023): it is true that the differences between native and immigrant students also depend on the generally lower ESCS level of the latter, but it is also true that as this level increases in the group of migrant students, these differences are significantly attenuated.

On the other hand, also according to the INVALSI 2023 report, again for grade 8, the individual ESCS factor weighs 8.1% on the score differences in Italian tests (9.7% school ESCS) while origin weights -27.1% and -14.3% for the first and second generations respectively. Similar results, although somewhat more attenuated, are obtained for the Mathematics tests, while for the English tests, the origin factor has a positive influence, even 9.5% for the

[8] It should be noted, however, that the historical series reconstructed here has a purely indicative value, as several important changes have occurred over the years, including the introduction of CBT tests. However, since this is a graph constructed on differences, these changes in the administration system should have affected native and immigrant students equally.

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English listening tests of the second generation. A similar dynamic can be seen in all the other grades[9].

In Italy, there is currently a heated debate on the evaluation of the school system, the inclusion of INVALSI tests in the student's curriculum, and the concept of merit (Corsini, 2022). This debate is intertwined with the problem of school inclusion of minorities at risk of educational poverty and the impact of school segregation and social background on the competencies of new generations of foreign origin, especially in Italian (Di Padova *et al.*, 2024). In reality, the uneven distribution of the population of migrant origin on the Italian territory and within large cities makes any upper limit on the percentage of the student component with non-Italian citizenship (CNI) in each school practically inapplicable. Nevertheless, there is no lack of virtuous examples of multi-ethnic and inclusive schools, thanks to the support of the third sector and the educating community (Scialdone and Aru, 2024).

These virtuous examples often escape a quantitative assessment based on standardised test results. Through INVALSI data, we obtain a macro (system) and meso (individual school or territory) level snapshot of school performance, assessed through tests that do not contemplate the dimension of transversal and citizenship skills, which are equally crucial for total equity and inclusion.

From a qualitative point of view, school self-evaluation reports (RAV) represent an essential source of information for monitoring and improving the quality of schools (Faggioli, 2014), also, in terms of their inclusiveness capacity, if they are seen not as a mere formal fulfilment but as an essential accountability and social reporting tool. Evaluating educational processes to improve them (Barone and Serpieri, 2016) means examining the educational strategies put in place by individual schools to face the challenge of including linguistic and cultural minorities.

An assessment based exclusively on accountability (Fondazione Giovanni Agnelli, 2014), learning aimed above all at passing standardised tests, runs the risk of orienting the educational choices of parents who have the opportunity to choose and of accentuating the Matteo effect highlighted above, i.e. weakening educational realities that are already lacking (because they are peripheral and/or have a strong migratory component, etc.), and strengthening schools that already function, since they are located in contexts that are already advantaged from a socio-economic and cultural point of view. This may turn into the translation on a systemic level of Don Milani's famous

[9] For example, on immigrant students' high school scores and transition to university see Giudici *et al.* (2023).

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metaphor of the selective or competitive school as a hospital that cures the healthy and rejects the sick. Moreover, Fondazione Giovanni Agnelli (2014) emphasises the difficulties in measuring actual merits and the controversial outcomes regarding the incidence of a reward system on student results, as noted by international experiences.

6. Findings: Spain

The economic crisis of 2008 has led to a change in the origin pattern of foreign students, implying more significant difficulties in terms of linguistic and cultural integration: Africa has overtaken South America as the region from which most foreign students arrive (30% versus 21% respectively); while students from Asia have doubled their weight, reaching the current 10%. Regarding geographical destinations, foreign students are mainly concentrated in Catalonia, Madrid, Valencia, and Andalusia, while the lowest number of foreign students is in Extremadura, Galicia, and Asturias. In terms of the geographical area of origin and destination, different patterns are observed in the regions with the greatest presence of foreign students: while in the Community of Madrid the predominant origin is Central and South America, in Catalonia and Andalusia African students prevail, while in the Community of Valencia the weight is more evenly distributed between the two groups.

In the academic year 2022/2023, there were 988,781 foreign students enrolled in the Spanish school system, slightly more than the 882,814 in the academic year 2021/2022, 11% of the total student body and about 15% of the total foreign residents. The population is distributed as follows: 30% from Africa (Morocco 70%), 21% from Central and South America (Colombia, Ecuador, Bolivia and the Dominican Republic), 10% from Asia (China). Despite the heterogeneity of cultures of origin, the triple stressors of acculturation, resettlement and isolation/rejection were found for all. These factors may interact in complex ways, contributing to higher levels of stress and psychological adjustment for those in acculturation and resettlement situations. Psychological support interventions, social integration programmes and inclusive policies can help mitigate the adverse effects of these stressors and facilitate a smoother transition for individuals into new cultural contexts.

The Spanish education system is characterised by a dualism between public and public schools: in the academic year 2020/2021, 78% of foreign students were enrolled in public schools, compared to 66% of Spanish students.

The first generation has worse academic results than native students.

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Second generations also perform worse than natives, although with more minor differences:

– the most significant delay, in both cases, concerns mathematical competence;
– in contrast, the Spanish language generates learning delays of about a third, 35%;
– the repetition rate of foreign students (50%) is more than double that of native students (22%), and for native students with immigrant parents it is almost double (42%);
– the level of English is high.

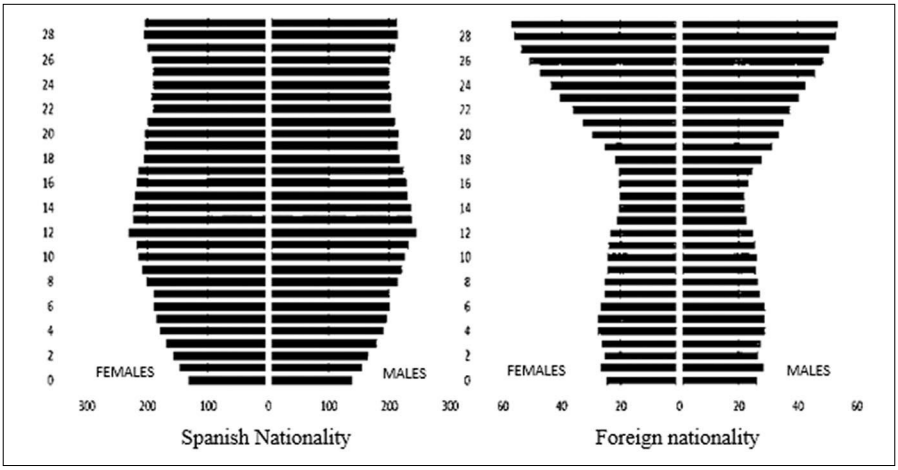

Fig. 4 – Distribution of the school-age population by nationality and age (data as of 1 July 2021 by nationality)

Source: own elaboration on Ministry of Education data

The presence of foreigners in the Spanish education system has grown steadily since the beginning of the century, only slowing down during the 2008 economic crisis due to its impact on migration flows (less inflow and more return).

Foreign students enrolled in higher education account for about 25% of the total number of students, which is much lower than the percentage of foreigners in the 18-29 age group (52%). The low level of enrolment in this age group is explained by the nature of economic immigration, which comes to Spain intending to enter the labour market as soon as possible.

School integration indicators were extrapolated from publications of the Ministry of Education and Vocational Training, together with the Ministry of University (EDUCAbase), the INE (using educational variables from the

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Labour Force Survey), and the Programme for International Assessment of Educational Achievement (PISA).

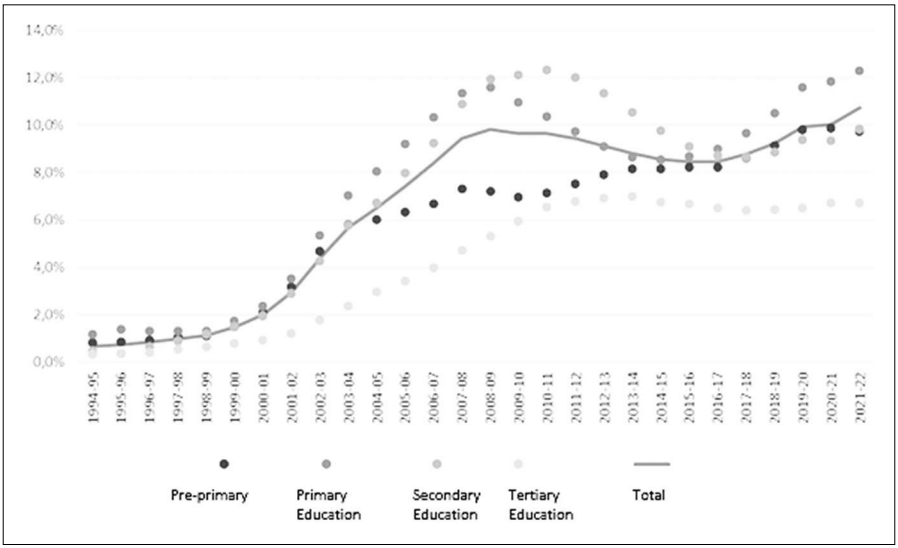

Fig. 5 – Evolution of the percentage of foreign students, out of the total number of students, at each stage of education

Source: own elaboration on Ministry of Education data

The analysis is divided into stages: before entry into the education system:

– *integration I*: access to education and training. Spaniards and foreigners do not have the same opportunities to access the school system: the gross enrolment rate of foreigners (49%) is just over a third lower than that of Spaniards (73%);
– *integration II*: public-private school segregation. Foreign students attend public schools more often than private ones. In the academic year 2021/22, of the total number of students attending public schools, almost 13% were foreigners, compared to 7% in public schools.

The second phase is during the stay in the education system:

– *integration III*: school performance and school drop out. Foreigners perform worse academically than natives, resulting in school drop outs of just over a year. Natives with immigrant parents also perform worse than natives, albeit with more minor differences. The most significant delay, in both cases, is in mathematical skills;
– *integration IV*: school environment, sense of belonging and suffering from bullying. According to PISA data, both foreign and native pupils with im-

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migrant parents show, compared to natives, a lower sense of belonging at school and greater exposure to bullying, mostly related to spreading nasty rumours about them, being hit or pushed and being excluded on purpose. The third stage, after dropping out:

– *integration V*: educational level of the adult population. As a result of all this, after their passage through the education system, the level of education attained by foreigners is significantly lower than that of natives. In particular, while 25% of Spaniards aged 25-34 have a level of education below the baccalaureate, this figure is 39% in the group of foreigners (50% more). These differences are more pronounced at higher levels of education. Thus, 53% of the Spanish population has a higher education than 30% of foreigners (the figure is 80% higher) and, above all, in non-university higher education, where the rate of Spaniards (16%) is more than double (120% higher) that of foreigners (7%).

It is also worth noting the high dispersion of values recorded by the level of education in some regions. The Basque Country stands out as the autonomous community with the highest dispersion in the enrolment of foreigners in public schools by level of education. The rates for pre-primary and primary education (78% and 74%, respectively) are substantially different from those for secondary education (55% and 74%, respectively) and higher education (62%), which, in turn, are the lowest rates in Spain. Asturias, Galicia, La Rioja and Cantabria are other regions with high dispersion. The percentage of foreign students enrolled in public schools is very high in all these regions (around 95 per cent in all cases). It is significantly lower than in the rest of the Autonomous Regions (around 95 per cent in all cases) and substantially different from that recorded in the rest of the educational levels (below 80 per cent). Castilla y León, Aragon, and the Balearic Islands also exhibit the same trend, albeit with lower rates and less distance from those recorded in other levels of education (below 80% in most cases). distant from those recorded in the other levels of education. The regionalisation of education is one of the explanations for reading these data, combined with public-private dualism.

7. Conclusions

7.1. Italy

If standardised tests constitute the "thermometer" useful for assessing the general health of our school system, these tests must be flanked by a more "qualitative" and shared component. Only in this way can the "diagnosis" con-

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sist of an all-around assessment, internal and external, territorial and centralised, quantitative and qualitative, be followed by an adequate "therapy". The National Recovery and Resilience Plan (NRP), which recognises the strategic importance of education, training, and research and allocates considerable human and material resources to them for the first time in many years, seems to be moving in this direction. It still remains to be seen how evaluation can contribute to the distribution of these resources and avoid "raining on the rain".

The National Observatory for the Integration of Foreign Pupils and Intercultural Education (2022) suggests several strategies to ensure that all students have the same opportunities for learning and development. This means removing economic, linguistic and cultural barriers that may prevent these young people from actively participating in school and social life.

First and foremost, schools should provide adequate language support for young migrants, including language lessons, individual tutoring and technology-assisted learning programmes. Furthermore, appropriate and inclusive instructional design is crucial for the quality of school provision, both distance and face-to-face. Quality design cannot fail to consider the fundamental mechanisms of learning and the specificities/peculiarities of the individual learner.

The personalisation of didactics, based on the shared co-construction of knowledge, at the service of the needs and cognitive demands of the learner (whether native or immigrant), makes him the undisputed protagonist of the didactic pathway, at the centre of a learning process calibrated on his needs, motivations and interests (Dal Zovo and Demo, 2022) and provided that the differentiation of teaching interventions has as its starting point an intercultural outlook (Demaio and Di Lecce, 2023) that can grasp the linguistic competences of the students, even in languages other than Italian.

The quality of training/education, if assessed in terms of its capacity to integrate disadvantaged subjects, is not only about performance but also about methodologically grounded design. It is this type of didactics that can be enhanced and, in turn, strengthen the digital competencies of the native and migrant student component, with the right mix of real and virtual, of tradition and technology, of classroom and e-learning, which is technically summarised in the term "blended", or Technology Enhanced Learning (Deplano, 2020), in which the new technologies represent a tool and not an end.

School staff training also plays a crucial role: teachers and trainers working with young migrants must have in-depth knowledge of their experiences and challenges. This means that they need to be adequately trained in the culture and language of migrant students' home countries and have access to resources and tools that can help them be more effective. This can help

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create a more welcoming learning environment and overcome cultural and language barriers (Ongini, 2019).

In order to create this learning environment, it is also necessary to activate the network of the educating community within which schools are embedded: voluntary and third-sector organisations, associations, the private social sector, etc. (Filosa and Gamberoni, 2023). In other words, the resilience of the school system should be assessed not only based on learning and the tests used to measure it but also based on the schools' ability to network with the territory, involve families and offer services such as psychological support, linguistic and cultural mediation, counselling and educational and training guidance, etc. (*ibid.*).

Thus, support for language learning, teachers prepared for cultural diversity, and the active involvement of families, students, and parents represent the "pillars" of the educational integration of pupils with a migration background (Santagati, 2024). Through the protagonism of the new generations with a migrant background and a critical reflection on the dominant intervention models, it is possible to develop those «emancipatory intercultural competencies» (Buraschi and Aguilar, 2023) and transformative ones in the awareness of the power asymmetries that characterise relations also in schools (and in assessment systems).

7.2. Spain

An important issue affecting the educational process of pupils of immigrant origin is the process of educational segregation. Thus, the fact that the families of foreign students linked to economic immigration have a lower-than-average level of financial and socio-cultural resources favours the educational segregation or concentration of these students in specific educational centres. Several studies in different areas in Spain show that educational outcomes tend to be lower for children who attend schools with a high percentage of students from low socio-economic backgrounds. resources, so this segregation affects both the educational process and outcomes.

In this sense, the distribution of economic immigration between public and private schools becomes relevant when analysing the integration of foreign students. The differences between the percentages of foreigners and Spaniards in state schools are even more pronounced when analysed for each educational grade (see Fig. 4).

Excessive segregation (or, in other words, low diversity) in some schools may damage overall educational performance, becoming a problem for for-

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eign students. Not only that, it becomes a problem for equal opportunities and the efficiency of the education system itself, which can also lead to higher failure and drop out rates of students. To avoid these situations, it is necessary to implement policies to mitigate initial socio-economic inequalities instead of reproducing them.

7.3. Common elements and implications for further research

Evaluating the educational and training inclusion of young people with a migration background requires a holistic and collaborative approach involving all system actors. This means that schools, parents, teachers, and local communities must work together to ensure that these young people receive an appropriate education and have the opportunity to realise their potential.

In order to close the gaps often highlighted by assessment systems, it would be necessary not only to promote widespread excellence but also to identify bad practices so that necessary corrective action can be taken. Learning from failures (Scialdone, 2021) is not only an extraordinary learning methodology for individuals but also the necessary outcome of any evaluation process that is not an end in itself. When policy transfer practices are not feasible or mechanically applicable, or transferable to other contexts, it is necessary to reason about the mistakes made to put in place an effective maturation of the reference systems without identifying easy scapegoats or simplistic solutions.

From this point of view, assessment itself can be a learning opportunity, both at the system level and the educational level (Corsini, 2023), to overcome an educationist model that considers the grade as the only motivational drive for learning. In order to reason about assessment, however, one first has to understand the idea of school and what pedagogical assessment aims.

How do we compare schools operating under challenging contexts, often providing inclusive teaching (which does not necessarily mean easier), with schools oriented instead towards more competitive teaching? Further in-depth studies, not only quantitative but also qualitative, would be necessary to understand which didactics and policies are best suited to bridging the gaps between the native and immigrant (and not only) components.

This article provides insights into the benefits of educational and training inclusion for young people with a migrant background, benefits that go beyond the individual migrant student. By improving the quality of education for all, an inclusive school can help create a more equitable and tolerant society.

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Setting up a proper evaluation system that considers the changes, including demographic changes, taking place in the school, in society, and those occurring during and after Covid-19 is only one aspect of the problem. As Martini and Sisti (2012, p. 309) point out: «The evaluation results must come to terms with the values and interests represented by political and social actors. Evaluation is bound to enter into decision-making processes that are erratic, confusing and often unresponsive to even the most robust rational demands».

A purely meritocratic evaluation can seriously hinder individual, systemic and organisational learning (Butera, 2006). Designing school evaluation systems that reward individual excellence rather than reducing inequalities risks ratifying and accentuating pre-existing inequalities due not to differences in cognition, ability or commitment but to linguistic, if not cultural, economic or social barriers.

The holistic concept of the whole system approach includes families and teacher preparation, as well as the evaluation of schoolchildren's extracurricular progression.

A truly inclusive school does not just select merit but creates it and lets it emerge, removing obstacles of any kind that stand between pupils and the free expression of their potential. A fair evaluation system should also take into account the schools' ability and possibility to network, support families, and support the social and relational capital present in the territory.

If it is true that a quality school is one of the goals of the 2030 Agenda for Sustainable Development (and evaluation systems can make a decisive contribution to this goal), it is also true that among these goals is the reduction of inequalities and poverty in all its dimensions, including education. By reducing (and not ratifying) inequalities, it is possible to overcome that "culture of rejection" that risks marginalising talents who are only "guilty" of not speaking our language well and, at the same time, to recover that link between theory empirical research and policy orientation (Landri and Maccarini, 2016) that is so important for a correct evaluation of the school system.

After all, education is only one aspect of the complexity of migration issues, in which individuals and communities and national and territorial systems are intertwined. For example, the effects of the acquisition of citizenship on educational outcomes have yet to be explored. If inclusion is a lifelong and life-wide process, school represents the first essential test bed for this process: a unique opportunity for global citizenship education.

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3. Resilient students: what are the factors behind the success of disadvantaged students?

by Silvia Duranti, Francesco Bogazzi

The relationship between socio-economic status and school achievement is well documented and extensive literature indicates that students from more advantaged backgrounds perform better at school tests. Despite this relationship, international assessments have highlighted that in practically all OECD countries there are a relevant number of "resilient students", i.e. students from a disadvantaged socio-economic background who achieve relatively high levels of performance in terms of education. In this chapter, we use micro-data provided by INVALSI to focus on individual, class and school-level characteristics that help disadvantaged students to become resilient at the end of lower secondary education. Our results highlight the importance of individual factors, while the variability between classes or schools is quite modest. At the individual level, the main factors behind resilience are the student's ESCS index and the nationality. At class level, there is a significant peer effect, as identified by the class average test score. Some variables on the characteristics of teachers have been tested on a regression estimated on the sample database but no statistically significant effect was found.

La relazione tra status socio-economico e rendimento scolastico è ben documentata e un'ampia letteratura indica che gli studenti provenienti da contesti socio-economici più elevati ottengono risultati migliori nei test scolastici. Nonostante questa relazione, dai dati delle rilevazioni internazionali degli apprendimenti emerge che praticamente in tutti i Paesi OCSE esiste un numero rilevante di "studenti resilienti", ovvero studenti provenienti da un contesto socio-economico svantaggiato che raggiungono livelli di rendimento relativamente elevati in termini di istruzione. In questo capitolo, utilizziamo i micro-dati forniti dall'INVALSI per concentrarci sulle caratteristiche individuali, di classe e di scuola che aiutano gli studenti svantaggia-

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ti a essere resilienti alla fine della scuola secondaria di primo grado (grado 8). I nostri risultati evidenziano l'importanza dei fattori a livello individuale, mentre la variabilità tra classi o scuole è piuttosto modesta. A livello individuale, i principali fattori alla base della resilienza sono l'indice di status socio-economico e culturale dello studente e la nazionalità. A livello di classe, emerge significativamente l'effetto dei pari, identificato dal punteggio medio al test INVALSI. Alcune variabili sulle caratteristiche degli insegnanti sono state testate sul database campionario ma non è stato riscontrato alcun effetto statisticamente significativo.

1. Introduction

Since the paper by Coleman (1966), the relationship between socio-economic status (SES) and school achievement has been well documented and extensive literature indicates that students from more advantaged backgrounds perform better at school and have more chances to complete their education successfully[1]. A wide literature has also demonstrated that it is not only a student's own SES that matters, but also that of classmates, according to the so-called "peer-effect"[2].

Despite this relationship, several international (OECD, 2010, 2011; Agasisti *et al.*, 2018) and Italian studies (Agasisti and Longobardi, 2014; Agasisti *et al.*, 2016) have highlighted the existence of a relevant number of "resilient students", i.e. students from a disadvantaged family who achieve relatively good results at school. According to OECD (2010), the proportion of resilient students can be considered a proxy of the equality of an educational system, since in an equitable school the impact of the socio-economic background on learning outcomes should be small; in contrast, in systems where the success of students depends to a large extent on their family background, the educational opportunities are distributed inequitably.

For this reason, there has been a growing literature focusing on factors behind the school success of disadvantaged students, not only at the individual level but also at class and school level. Several studies show that a high level of family disadvantage (Agasisti *et al.*, 2018) is amongst the main individual determinants of resilience, while gender and a foreign citizenship play a heterogeneous role according to countries and the subject of the test used to measure resilience (OECD, 2011; Agasisti and Longobardi, 2014).

[1] See Fadda *et al.* (2023) for a recent review of Italian studies.

[2] A summary of this stream of literature is provided by van Ewijk and Sleegers (2010).

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Personality traits also emerge as important factors behind the success of disadvantaged students, as resilient students are more motivated and confident about their capabilities and possess more ambitious aspirations than their disadvantaged low-achieving peers (Borman and Rachuba, 2001; OECD, 2011; Agasisti and Longobardi, 2014).

As regards school practices and resources, OECD (2011) finds very little evidence of an association with the probability of resilience, while Agasisti and Longobardi (2014) and Agasisti *et al.* (2018) highlight the importance of some school factors, for example the existence of extracurricular activities and school leadership, while class size and the student-computer ratio are far less relevant. Researchers also generally agree about the importance of having caring and supportive teachers (Borman and Rachuba, 2001; Agasisti and Longobardi, 2014), as well as high performing peers (Agasisti *et al.*, 2016).

Our paper analyses the factors behind the success of disadvantaged students at the end of lower secondary school, a critical stage in the educational path of young people. Indeed, it is in lower secondary education that gaps between school outcomes widen, determining the segmentation of students between upper secondary tracks and impacting permanently on future career prospects (Fondazione Agnelli, 2011; Gavosto and Romano, 2021). For this reason it is crucial that lower secondary school guarantees all students equal education opportunities despite the different family background.

The remainder of the paper is organized as follows. Section 2 describes the data and methodology used, also providing some descriptives; Section 3 contains the results and Section 4 concludes.

2. Data, methodology and descriptives

2.1. Data

In this paper, we use data from the standardized tests conducted by INVALSI, which evaluates the Italian, Math and English competences of all Italian students in grades 2, 5, 8, 10 and 13. The assessments consist in an annual census administered in Spring and participation is compulsory for all students attending the cited grades. INVALSI also provides sample data for a subgroup of students attending classes and schools where the test is administered under the supervision of external observers in order to limit cheating phenomena.

Our analysis relies on INVALSI grade 8 Math and Italian data for the school year 2020/2021. Main estimates are conducted on the census dataset

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but some estimations are carried out also on the sample dataset, which can be merged with information coming from teachers' questionnaires, which are also surveyed by INVALSI.

The s.y. 2020/2021 census Italian grade 8 dataset is composed of 520,462 students; the Math dataset of 523,032 students. Around 2% of total students also make part of the sample dataset, which can be merged with the teacher dataset.

2.2. Methodology

Our analysis consists of two different steps.

The first step consists in the identification of resilient students, using two different definitions according to the literature; a second step consists in the estimation of the main determinants of the probability of being resilient, using a multilevel logistic regression model through which it is also estimated the probability of being resilient for different student profiles.

The identification of resilient students starts from the detection of the group of students that can be considered disadvantaged, usually those with an Economic, Social and Cultural Status (from now, ESCS) index amongst the bottom 25% or 33% in a country.

In literature several definitions of resilient students have been proposed and they can be broadly divided into two main streams: those based on absolute performance standards (a certain proficiency level considerate adequate for a grade) and those based on performance relative to the individual ESCS level. The first type of definition is adopted, among others, by Agasisti *et al.* (2018) while the second one is used by OECD (2010) and Agasisti and Longobardi (2014).

We identify disadvantaged students as those with an ESCS index amongst the bottom 25% at the national level and test on our data both types of definitions of resilience, following Agasisti *et al.* (2018) for the first one and OECD (2010) for the second one.

The definition of Agasisti *et al.* (2018) is based on the level of proficiency and considers resilient those students able to achieve at least level 3 in PISA test. Coherently, we use level 3 in INVALSI test, a level which corresponds to adequate skills in grade 8 according to ministerial indications. According to this approach, 36% of grade 8 disadvantaged students are resilient in Italian, as shown in Table 1.

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Tab. 1 – Distribution of grade 8 students by quartile of ESCS index and level of proficiency at the Italian INVALSI test

Skill level in Italian	*Quartiles of ESCS index*			
<1	0.2%	0.0%	0.0%	0.0%
1	30.8%	14.7%	9.4%	4.4%
2	32.8%	26.8%	21.4%	13.9%
3	23.6%	32.2%	32.8%	29.8%
4	10.0%	19.3%	24.6%	31.0%
5	2.6%	7.1%	11.8%	20.9%
Total	100.0%	100.0%	100.0%	100.0%

The second approach in the definition of resilience identifies resilient students as those coming from a disadvantaged socio-economic background and performing much better than would be expected based on their background. To identify these students, OECD (2010) estimates a regression of test scores on the individual ESCS index, in order to establish a relationship between performance and socio-economic background across students; the residuals from this regression are then used to identify resilient students as those disadvantaged ones with a residual performance amongst the top quarter of students' residual performance. According to this approach, 24% of our grade 8 students are resilient in Italian test.

The two definitions are compared in Tables 2 and 3, which show that 35% of those considered resilient according to the first definition are not resilient according to the second one; instated, only the 2% of those considered resilient according to the second definition are not resilient according to the first definition.

Tab. 2 – Distribution of grade 8 students by resilience, according to two different definitions (row percentages)

		OECD (2010) definition		
		Non resilient	*Resilient*	*Total*
Agasisti *et al.* (2018) definition	Non resilient	99.0%	1.0%	100.0%
	Resilient	35.0%	65.0%	100.0%
	Total	76.0%	24.0%	100.0%

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Tab. 3 – Distribution of grade 8 students by resilience, according to two different definitions (column percentages)

		OECD (2010) definition		
		Non resilient	*Resilient*	*Total*
	Non resilient	83.0%	1.0%	64.0%
Agasisti *et al.* (2018) definition	Resilient	17.0%	99.0%	36.0%
	Total	100.0%	100.0%	100.0%

We choose the first definition because it is based on an absolute and not relative measure of competences, which are those considered adequate for Grade 8 by ministerial indications.

The same definition has been used to identify resilient students in Math, which represent 33% of disadvantaged students.

The second step of our analysis is aimed at investigating which aspects belonging to students, families and schools increase the probability of becoming a resilient student. The methodology used consists in a two-level random intercept model (Raudenbush and Bryk, 2002; Goldstein, 2011) to properly take into account the hierarchical structure of the data, i.e. students nested into classes and schools; considering that our dependent variable is dichotomous, we opted to use a multilevel logistic regression approach.

We tested two different types of multilevel models, one with the class and one with the school as second level unit, according to the following specification.

Let Y_{ij} be the binary response, i.e. $Y_{ij} = 1$ if the i-th student of the j-th school/class is resilient and zero otherwise, where $i = 1, \ldots, n_j$ denotes the number of students (level 1 units) nested within the second level unit (or cluster) j, i.e. the school/class, $j = 1, \ldots, J$, and J is the total number of considered schools/classes. Given the success probability, $\pi_{ij} = P(Y_{ij} = 1|x_{ij}, u_j)$ the model is specified as follows:

$$logit\,(\pi_{ij}) = \log\left(\frac{\pi_{ij}}{1 - \pi_{ij}}\right)\beta x_{ij} + u_j$$

where x_{ij} is the vector of covariates for the i-th student of the j-th cluster (including a constant term for the intercept) and β is the vector of fixed parameters (including the intercept). The residuals u_j, representing the second level variance, are assumed to be independent and identically distributed across clusters with a normal distribution and common variance; model fitting is performed using the *melogit* procedure of Stata (StataCorp, 2023).

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The model has been estimated both for the Italian score and for the Math score.

The covariates included in the model are individual, class and other types of characteristics, as shown in Table 4.

Students' covariates considered in our model are:

- female, a dummy taking value 1 if the student is female and 0 if male;
- semester of birth, a dummy taking value 1 if the student is born in the second semester of the year and 0 otherwise;
- nationality and country of birth, a categorical variable taking value 1 if the student is native, 2 or 3 if he/she is a first generation foreigner born in the EU or outside the EU, 4 if he/she is a second generation foreigner;
- ESCS, a proxy variable of socio-economical status, built by INVALSI through a principal component analysis of three indicators: employment status of pupil's parents, the level of education of pupil's parents and the possession of a range of specific goods3. The ESCS variable has been standardized with mean equal to 0 and standard deviation equal to 14;
- books at home, a categorical variable which takes the following values: less than 10 books, between 11 and 25 books, more than 26 books.

Class covariates are:

- class size, calculated on the basis of students who have taken the test[5];
- full-time, a dummy variable taking value 1 if the student attends a full-time class (34 hours or more) and 0 otherwise;
- average ESCS index in the class, a compositional variable which measures the average socio-economic status of the peers.

Other variables included in the model are:

- geographical area of the student, a categorical variable taking the following values: North, Centre, South;
- number of students for each pc available in the school, a variable which can proxy the available resources at school level.

[3] More specifically, these "goods" concerns: a quiet place to study, a personal desk for homework, encyclopedias, internet connection, burglar alarm, a room exclusively devoted to the student, more than one bathroom, more than one car in the family, more than one hundred books.

[4] For a description of the index see: https://www.invalsiopen.it/indicatore-escs-valutazione-equa/.

[5] The real number of students of the class is not available in the dataset.

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Tab. 4 – Covariates used in the model

Individual variables	*Class variables*	*Other variables*	*Teacher variables (sample dataset)*
Sex	Full-time/Part-time	Geographical area	Age
Semester of birth	Average class score (quartiles of)	Number of students per PC (quartiles of)	Working seniority
Nationality and country of birth	Class size		Type of contract (fixed-term or permanent)
ESCS index			Perception of the school readiness for Remote Teaching
Number of books at home (quartiles of)			Personal difficulties during Remote Teaching

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Using the sample dataset containing information on teachers, we tested the following covariates:

- age of teacher, a categorical variable taking the following values: less than 49, between 49 and 60, more than 60 years;
- working seniority of teacher, a categorical variable taking the following values: 1 year, 2-3 years, 4-5 years, more than 5 years;
- type of contract, a dummy taking value 1 if the teacher has an open-ended contract and 0 otherwise;
- perception of the school readiness for Remote Teaching, a dummy taking value 1 if the teacher considers the school enough or very prepared for Remote Teaching;
- personal difficulties during Remote Teaching, a dummy taking value 1 if the teacher has often or always encountered some kind of difficulties in doing Remote Teaching.

2.3. Descriptives[6]

As already said, according to our definition of resilience, 36% of grade 8 disadvantaged students are resilient in Italian, although this percentage changes considerably with some personal characteristics. In particular, Figure 1 shows that the percentage of resilient students is higher among females (40%), those born in the first semester of the year (38%) and among natives (38%); resilient students are less frequent among males (33%) and foreigners, especially first generation ones, born out of the EU (18%). The resilience of students varies also in relation to the cultural background of the family with the number of books at home.

The percentage of disadvantaged students who can be considered resilient shows a high variability across regions (Figure 2), ranging from 47% of Valle d'Aosta to 27% of Calabria; most Northern regions have percentages of resilience higher than the national average, while Southern ones have often lower percentages.

The percentage of resilient students also greatly varies according to the personal ESCS index, as shown in Figure 3, indicating that those who are less disadvantaged more frequently manage to overcome their social background and achieve a satisfying level of competences in Italian.

[6] Descriptives refer to the Italian dataset but the ones based on the Math dataset are available on request.

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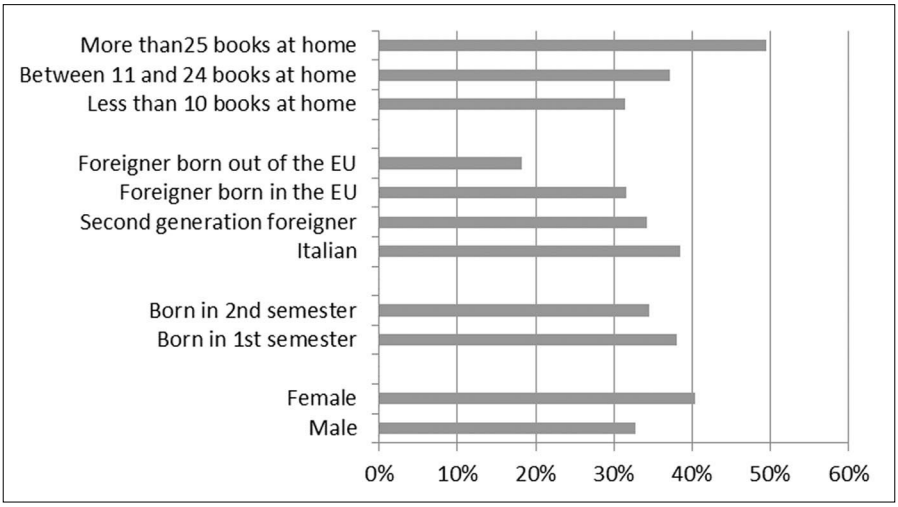

Fig. 1 – Percentage of resilient students among grade 8 disadvantaged students, by characteristics

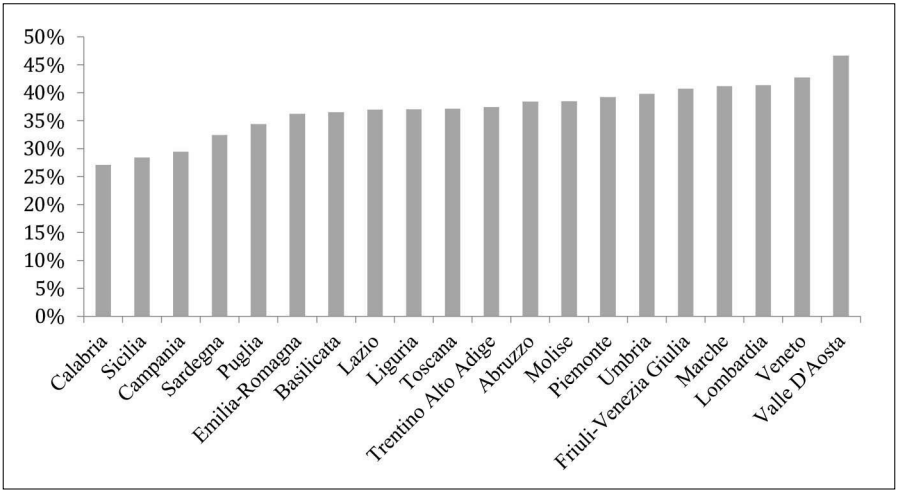

Fig. 2 – Percentage of resilient students among grade 8 disadvantaged students, by region

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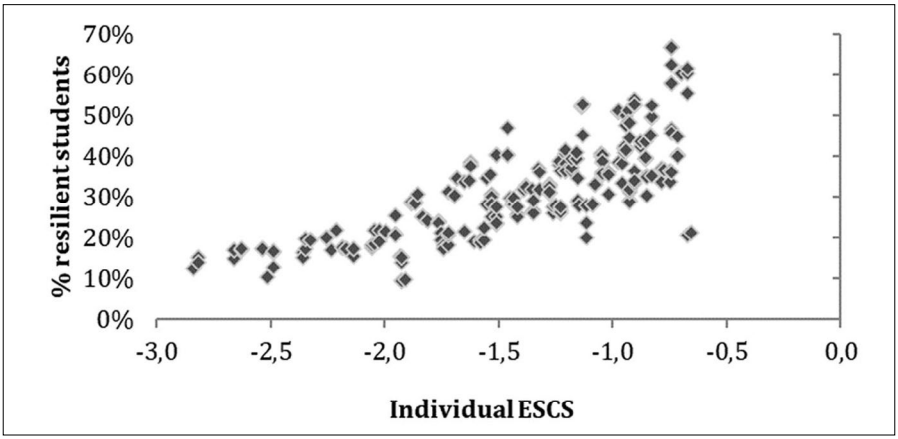

Fig. 3 – Percentage of resilient students among grade 8 disadvantaged students (axis y) and individual ESCS (axis x)

3. Results

The model is first estimated without covariates (intercept-only model or empty model) in order to assess the Intraclass Correlation Coefficient (ICC), that is the proportion of variation in the probability of becoming a resilient student attributable to schools/classes. According to the estimated ICC, class and school explain 8.6% and 5.5% of variability, respectively. The likelihood-ratio test, which compares the random intercept model to ordinary logistic regression, is highly significant for both models, confirming a "class effect" and a "school effect", which can change the resilience probability of a student.

The final specification uses class as second level unit and results are presented in Table 5. Once controlled for exogenous variables, the likelihood-ratio test is still highly significant, pointing out unexplained second level variability, which however appears to be much smaller than in the empty model (1.5% vs 5.6%).

The analysis of results highlights the importance of individual characteristics in explaining the probability of a disadvantaged student of being resilient. The origin of a student plays a major role, with all foreigners having a significantly lower probability of resilience; however, the gap is smaller for second generation foreigners (-9%) and increases for first generations ones, especially those born outside the European Union (-24%). The multilevel model confirms the importance of the economic, social and cultural status of

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a student, measured by the ESCS index; those who are less disadvantaged among the disadvantaged are more likely to appear resilient performing well in Italian. Also the gender of a student has a role in influencing his probability of resilience and disadvantaged females have a +8% probability of succeeding in reading; the semester of birth variable indicates a 3% advantage for students who are older compared to their younger classmates. The last individual variable which has a statistically significant impact on the probability of resilience notwithstanding the inclusion on the ESCS index is the number of books at home.

Tab. 5 – Results of the multilevel logistic regression on resilience in the Italian test (marginal probabilities)

	dy/dx	*Std. Err.*	*z*	*P>z*	*[95% Conf. Interval]*	
Female	0.080	0.00	24.84	–	0.07	0.09
Born in 2nd semester	-0.029	0.00	-8.86	–	-0.03	-0.02
Foreigner born in the EU	-0.112	0.01	-7.50	–	-0.14	-0.08
Foreigner born out of the EU	-0.244	0.01	-43.79	–	-0.25	-0.23
Second generation foreigner	-0.094	0.00	-20.06	–	-0.10	-0.08
ESCS index	0.134	0.00	31.22	–	0.12	0.14
Less than 10 books at home	-0.027	0.00	-6.52	–	-0.03	-0.02
More than 25 books at home	0.076	0.00	18.74	–	0.07	0.08
Full-time class	0.011	0.01	2.07	0.04	0.00	0.02
2nd quartile of class avg test score	0.137	0.00	31.73	–	0.13	0.14
3rd quartile of class avg test score	0.223	0.00	45.54	–	0.21	0.23
4th quartile of class avg test score	0.322	0.01	56.33	–	0.31	0.33
1st quintile of students per PC	0.012	0.01	2.32	0.02	0.00	0.02
2nd quintile of students per PC	0.013	0.01	2.53	0.01	0.00	0.02
3rd quintile of students per PC	0.003	0.01	0.58	0.56	-0.01	0.01
4th quintile of students per PC	-0.002	0.01	-0.33	0.74	-0.01	0.01
School located in the Centre	-0.025	0.00	-4.96	–	-0.03	-0.01
School located in the South	-0.079	0.00	-18.71	–	-0.09	-0.07

At the class level, a small but statistically significant effect is found for full-time classes, which can help disadvantaged students overcoming their background though more time spent at school and out of the family. An even stronger effect is observed for peer influence, measured by the quartiles of the class average test score. Attending a class where the average score falls in the top quartile increases the probability of being a resilient student by 32%. The effect of school resources, as measured by the number of students per PC, is

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very small but statistically significant; greater availability of computers is associated with a higher probability of resilience among disadvantaged students.

Finally, the area of residence maintains a role also after the inclusion of the ESCS index and other personal characteristics; in particular, attending a school in the South decreases the probability of resilience by 8% compared to the North.

Table 6 provides the probability of being resilient for three different students profiles. The higher probability of being resilient (83%) is found for an Italian female born in the first semester, with over 25 books at home and top ESCS index amongst disadvantaged ones, in a top performer class of the Centre of Italy; the probability decreases to 37% for an Italian male born in the second semester, with 15 books at home and average ESCS index amongst disadvantaged ones, in a medium performer class of the Centre of Italy; finally, a foreign male born in the EU in the second semester, with less than 10 books at home and low ESCS index amongst disadvantaged ones, in a low performer class of the South, has a very low probability of being resilient (4%).

Tab. 6 – Predicted probability of resilience for typical profiles of disadvantaged students

Italian female born in the first semester, with over 25 books at home and top ESCS index amongst disadvantaged ones, in a top performer class of the Centre	0.83
Italian male born in the second semester, with 15 books at home and average ESCS index amongst disadvantaged ones, in a medium performer class of the Centre	0.37
Foreign male born in the EU in the second semester, with less than 10 books at home and low ESCS index amongst disadvantaged ones, in a low performer class of the South	0.04

The logistic multilevel model has also been estimated for Math[7], where the percentage of resilient students is slightly lower (33% vs 36%). The estimation of the empty model has highlighted that the between class variance of the probability of being resilient is higher (12.2%) than in Italian (8.6%), pointing to a major role of class variables, such as the teacher. Also the residual in the full model is much higher in the Math model (6%) than in the Italian model (1.5%) pointing to a greater impact of non observable characteristics at the class level, such as those related to teachers' style of teaching and other characteristics.

[7] Detailed results available upon request.

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As regards covariates, gender has the opposite effect in the probability of resilience: females are less likely to be resilient (-6%) in Math compared to their male counterparts. The origin of the student impacts less on math resilience and second generation foreigners have the same probability of being resilient as Italian students; a significant disadvantage still exists for first generation foreigners, especially those born out of the European Union.

Among class variables, full-time has a slightly higher effect on math resilience (+2%) strengthening the idea that longer time spent at school can have some benefit on disadvantaged students.

The estimation of the multilevel model on the sample dataset, using teacher covariates, has not provided statistically significant results for the new variables tested, providing no evidence for the role of observable teacher characteristics and readiness for Distance Teaching in the probability of becoming a resilient student.

4. Conclusions

This paper aims to identify the main determinants of the resilience of some disadvantaged students, who manage to overcome their family background achieving good levels of school competences. Our results highlight the importance of individual factors, while the variability between classes or schools is quite modest. At the individual level, the main factors behind resilience are the student ESCS index and the nationality. At class level, there is a significant peer effect, as identified by the class average test score. The area of residence has a statistically significant effect on resilience even after the inclusion of the other variables, confirming the well-known North-South divide. Some variables on the characteristics of the teachers have been tested on a regression estimated on the sample database but no statistically significant effect was found. This does not imply that these factors are irrelevant, but rather that the INVALSI sample provides no empirical support for these hypotheses.

In this sense, further research is needed to better understand the role of teachers in the success of disadvantaged students. The use of the census dataset merged with administrative data in the characteristics of teachers, provided by the Ministry of Education, could be an option. Further research could also concern the adoption of a dynamic perspective, following students from lower to upper secondary school, in order to understand whether the resilience is a persistent phenomenon across the educational path of some disadvantaged students.

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4. Teacher occupational instability and inequalities in student learning. New evidence from INVALSI Data, 2017-2022

by Giovanni Antonini, Gianluca Argentin

This study aims to investigate whether in Italy it occurs a matching between teachers with temporary contracts and students from more disadvantaged social backgrounds. The objective is to understand whether the factor of teachers' occupational instability may play a role in perpetuating inequality in the Italian school system. According to previous literature, despite a public and centralized Italian school system, phenomena of segregation between students of different socio-economic backgrounds are deeply rooted; segregation processes may occur also among teachers, reinforcing education inequalities. The research highlights differences in probability for students with disadvantaged socio-economic and migratory backgrounds of having an unstable teacher, namely with a temporary employment contract or involved in the massive turnover among schools. The dataset used is original as it provides data for grades 2, 5, 8, and 10 for four consecutive school years from 2017/2018 to 2021/2022, creating a sample of 18,188 teachers matched with a population of 344,871 students. The results show a high heterogeneity in the phenomenon of teachers' employment instability, with the turnover factor involving more students. The association with socio-economic and migratory background is positive, as expected, albeit with modest values; the unfair students-teachers matching is concentrated in secondary education (grades 8 and 10).

Questo studio mira a indagare se in Italia si verifichi un matching tra gli insegnanti instabili con gli studenti provenienti da contesti sociali più svantaggiati. L'obiettivo è quello di comprendere se il fattore dell'instabilità occupazionale degli insegnanti giochi un ruolo nella perpetuazione della disuguaglianza. In linea con la letteratura, infatti, nonostante un sistema scolastico italiano pubblico e centralizzato, i fenomeni di segregazione tra studenti di differente origine socio-economica sono profondamente radicati;

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i processi di segregazione possono verificarsi anche tra insegnanti, rafforzando le disuguaglianze educative. La ricerca evidenzia differenze di probabilità per gli studenti con svantaggiato background socio-economico e migratorio di avere un insegnante instabile, cioè con un contratto di lavoro precario o coinvolto nel massiccio turnover tra scuole. Il dataset utilizzato è originale poiché presenta i dati per i gradi 2, 5, 8 e 10 per quattro anni scolastici consecutivi dal 2017/2018 al 2021/2022 creando un campione di 18.188 insegnanti abbinati a una popolazione di 344.871 studenti. I risultati evidenziano un'alta eterogeneità del fenomeno di instabilità occupazionale degli insegnanti, con il fattore del turnover che coinvolge più studenti. L'associazione con il background socio-economico e migratorio è positiva, come previsto, seppur con valori modesti; l'abbinamento iniquo insegnanti-studenti si concentra nell'istruzione secondaria (grado 8 e 10).

1. Introduction

The intergenerational reproduction of social inequalities takes place primarily through unequal educational attainment, questioning the role of the school system as an equalizer leverage in Western societies. This issue is increasingly being addressed by a strand of educational and sociological research that questions the mechanisms underlying this logic of discrimination.

The factors that affect these inequalities are different, starting with the effect of students' parental background on their school performance (primary effects, according to Boudon 1974), passing through the family's willingness to invest in education, net of school results (secondary effects, Boudon 1974), and arriving at the role that teachers and school principals may play in reinforcing educational inequalities (tertiary effects, Scheinder, 2014; Esser, 2016; Abbiati *et al.*, 2017; Argentin and Pavolini, 2020). While studies on primary and secondary effects have been widely developed (Jackson *et al.*, 2007; Jackson, 2013, Contini *et al.*, 2010; Erikson, 2007), this is not the case for tertiary effects, either because of a later conceptualisation of the phenomenon or because of less availability of relevant data. On the conceptualization side of the story, tertiary effects may be interpreted in a narrow way as biases signals coming to parents from teachers (Scheinder, 2014; Esser, 2016) or, more broadly, as a set of mechanisms operating at school level through the actions of teachers and principals, reinforcing primary and secondary effects (Argentin and Pavolini, 2020).

In Italy, there are numerous studies that, relying on the first conceptualization – tertiary effects as biased signals arriving from teacher, generated

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relevant evidence. Argentin and Triventi (2015) analysed how distortions are present in the grades given by teachers to students from disadvantaged backgrounds with equal standardised performance in INVALSI tests. Triventi (2019) also confirmed how assessment biases are present for students from an immigration background in a study that focused on primary and lower secondary schools. In the same direction is the evidence regarding biases in teachers' guidance advice for secondary school choice. This distortion is driven by the characteristics attributable to students (Ballarino and Schizzerotto, 2011; Argentin, Barbieri and Barone, 2017; Azzolini and Vergolini, 2014; Manzella and Argentin, 2024).

We rely here on the broader conceptualisation of tertiary effects and we focus on one specific mechanism unequally affecting students achievement, reinforcing primary effects, namely the teacher-student pairing. Evidence on this mechanism was already generated in Italy (Abbiati, Argentin and Gerosa, 2017; Barbieri, Cipollone and Sestito, 2007; Barbieri, Rossetti and Sestito, 2011), but we focus here on the unequal distribution of occupationally unstable teachers, by definition the less experienced and didactically discontinuous. This phenomenon is worthy of attention because having unstable teachers in employment can be a disadvantage for students, especially those from low social backgrounds. It must be also considered that the phenomenon itself is highly heterogeneous, due to the fact that teachers' instability in the classes is the combination of their temporary contracts and their turnover among schools, also for the permanent contracted ones. In addition, the school years spent by a teacher in the class is another relevant component of the phenomenon itself. We try to investigate all these features of teachers' instability in our analyses, thanks to the availability of much more data on teachers-students pairing than in the past. The literature highlights that among the peculiarities of the Italian system influencing the phenomenon, there are territorial segregation, the labour market for teachers, and the tendency of teachers to seek greater occupational well-being during their professional careers.

Hence, the aim of the present work is to assess whether there is an unequal allocation of occupational unstable teachers to students in schools and classrooms. More precisely, our question is whether there is any association between students with low socio-economic and migration backgrounds and teacher who does not have a permanent contract or those who finds himself having recently changed schools where they worked.

The paper is organised as follows. In the next section (par. 2), a literature review is provided, collecting the most relevant evidence produced on the topic. Paragraph 3 describes the data, the sample and the models used to

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carry out the analysis. This is followed by a paragraph (par. 4) illustrating the results and finally, paragraph 5 concludes by highlighting the value of the study and its implications.

2. Previous literature

The first studies in the field of teacher-student matching research were conducted in the United States, thanks to the considerable availability of data and a context that was predisposed to strong segregation of teachers and students among schools. The latter is due to a more general housing segregation and a large presence of ethnic minorities with poverty conditions affecting an important section of society. In this context, the associations between certain demographic factors of students, such as socio-economic background, ethnicity and poverty status, with some desirable traits of teachers – seniority, possession of a degree, field of study – have been analysed (Wayne and Youngs, 2003). From this strand of research, evidence arises that students from privileged backgrounds are substantially more likely to be matched with a good-performing teacher, to the detriment of disadvantaged students (Goldhaber *et al.*, 2015; Hanushek *et al.*, 2005; Sass *et al.*, 2012). More specifically, it was highlighted that teachers with more experience, a degree in the teaching field and other factors that make them more effective are matched with predominantly white students with good socio-economic backgrounds and high standardised test scores (Goldhaber *et al.*, 2015; Hanushek *et al.*, 2005).

Analysing the situation also at a territorial level, it was noted that schools serving poorer neighbourhoods face teacher shortages more often and display higher rates of transfer requests and thus turnover (Hanushek *et al.*, 2005). These divergences are amplified by the different effectiveness of teachers in their profession. In fact, expert teachers – who find themselves in more advantaged contexts – have greater effectiveness in educating and transmitting concepts than teachers who are just starting out in the profession – who find themselves teaching in disadvantaged contexts (Rivkin *et al.*, 2005). This effectiveness increases with increasing years of service, thus resulting in teachers with decades of experience having a much greater professional capacity than novices (Kini and Poldolski, 2016).

Turning to the Italian context, a strand of research has developed in recent years in order to highlight whether such inequality mechanisms as those in the United States were present. In spite, in fact, of the centralised structure that manages the Italian education system and the allocation of teachers

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to schools, the question has been raised. An increasing number of studies showed that teachers-students matching is not neutral even in the mainly public and highly centralised Italian education system (Argentin, 2018; Abbiati, Argentin and Gerosa, 2017; Abbiati and Argentin, 2019; Barbieri, Cipollone and Sestito, 2007; Barbieri, Rossetti and Sestito, 2011). Teachers – and their labour market – and the ways in which schools operate play a crucial role in the quest for equity of education system. Especially precariousness and teachers turnover among school demonstrate the existence of tertiary effects at this level. Indeed, teacher turnover is one of the biggest problems the system suffers from with rather high rates. Turnover is critical since it interrupts teaching didactical continuity and prevents the establishment of strong relationships between school leaders, teachers and families. Results show that teacher turnover is negatively correlated with students' academic performance as measured by the PISA 2003 mathematics test (Barbieri *et al.*, 2007). Another mechanism that increases the instability of the profession is the number of fixed-term contracts that remain a not insignificant part of the teacher labour market. A study by Ferrer-Esteban (2011) showed that there is a negative correlation between fixed-term contracts and students' performance. Barbieri *et al.* (2011) added to this research a contribution showing that Italian teachers request a transfer to other institutions to escape from those more difficult school situations, where teachers find themselves working in complex and arduous social and cultural contexts; from this, it merges clearly that teachers' preferences are strongly influenced by non-pecuniary factors such as student characteristics, in a system characterized by flat wages. It should also be mentioned that the organisational mechanism of teacher mobility plays a key role. Indeed, among the transfer requests that only permanent teachers can apply for, priority is given to those with more years of service. This process brings about a mobility that tends to go to the most desirable vacancies, giving up those located in more complex professional and social contexts. Coherently, we find teachers who are in more difficult situations, being at their first experience and frequently with temporary contracts, assigned to students who need more help from teachers. These same needs are disregarded by the mobility phenomenon, producing a source of inequality in the school system. While the condition of some teachers is improved, the condition of others is worsened, and the same reasoning can also be made on the student side. There is therefore no doubt that turnover and mobility play a role in the inequalities reproduction perpetrated by the school system. Consequently, this strand of research has tended to emphasise how there are different teachers for different students, producing an increase in inequality within the education system (Abbiati, Argentin and Gerosa, 2017). This

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latter study investigated teacher-student matching for the year 2013/2014 in Italian primary and secondary schools by exploiting INVALSI data, showing how there is an unequal match between teachers and students for both mathematics and Italian, with particular emphasis on middle schools. The Italian school system, despite its strongly public nature, implements unequal teacher allocation mechanisms influenced by the student's social background. The research has shown how different circumstances cause discrepancies, starting from students' socio-economic background factors, passing through the environmental context of reference, to the segregation in place for teachers with less desirable traits, such as experience and employment contract.

On the basis of this amount of evidence, we develop an attempt to classify through different nuances the instability of the teaching profession and related matching to students, in order to identify what the major phenomena are. These more detailed analyses are made possible by the fact that we rely on a dataset larger than all the previous ones used to investigate teachers-students pairing.

3. Data and methods

Several databases created by INVALSI are used to carry out the analysis. In order to pursue the research objective, a process was implemented to link the data referring to teachers with the respective students in their classes. To get a matching of teachers' data with students' data, the database for the main sample was used: this includes data from the teachers' questionnaire and the students' tests respectively. Four sequential school years are taken into account, the most recent years available at the time the analysis was carried out were selected: 2017/2018, 2018/2019, 2020/2021, and 2021/2022 – 2019/2020 was not produced due to the pandemic crisis –, and for each of them, data are analysed for four different school grades, i.e. school grade 2, 5, 8 and 10 – grade 10 is missing for school year 2020/2021 due to Covid-19. We include in the analysis both teachers of Italian and Mathematics.

The choice of a multi-year realisation is based on two pivotal criteria: the first is the desire to be able to examine the research phenomenon over a larger sample number than in a single year; the second is related to a longitudinal (repeated cross-sectional) analysis, which could also highlight the presence of a possible temporal trend. With regard to the choice of the school grades considered, it was decided to analyse compulsory schooling, i.e. under Italian law (Law 296/2006) primary and secondary school with the addition of the first two years of upper secondary school. Finally,

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although the INVALSI data also include the administration of English language tests, it was decided not to consider the latter due to the lack of the respective questionnaire for teachers.

The overall sample that was made considers 18,188 teachers, as the sum of Italian and mathematics teachers, who were matched to a population of students consisting of 344,871 units. This number represents the number of students that could be matched to at least one teacher who answered his/her the questionnaire.

Table 1 shows the response rates of Italian and mathematics teachers by grade and school year as a percentage of students, with an overall average coverage of 62.3% for students matched with both teachers. While for students matched to one of the two teachers, their response rates increase to 69% both for Italian and mathematics. The heterogeneity across school grades and school years is not negligible.

Tab. 1 – Italian and Mathematics teachers' response rates by grade and year (% of students)

Year	*Grade*	*Italian*	*Maths*	*Both*	*Base*
2018	2	65.0	64.9	58.8	25,774
2018	5	65.6	65.2	59.5	27,001
2018	8	69.2	70.6	64.5	29,658
2018	10	66.9	69.0	61.6	43,643
2019	2	59.2	57.4	51.1	24,361
2019	5	60.8	60.1	53.9	25,467
2019	8	67.2	70.5	62.0	30,047
2019	10	62.4	62.9	54.4	37,653
2021	2	72.3	68.4	60.5	16,683
2021	5	73.2	66.9	59.9	17,491
2021	8	72.5	67.3	61.9	9,863
2022	2	85.4	86.7	81.7	16,568
2022	5	85.3	86.9	81.8	17,533
2022	8	83.1	85.1	78.7	3,806
2022	10	82.9	81.4	76.3	14,751
Overall	2	68.8	67.8	61.4	83,386
Overall	5	69.6	68.4	62.4	87,492
Overall	8	69.6	70.9	63.9	73,374
Overall	10	68.3	69.1	61.7	100,619
Overall		69.03	68.99	62.27	344,871

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3.1. Definition of independent and dependent variables

From the constructed dataset, both dependent and independent variables are identified and defined.

For the independent variables, the student's socio-economic background (ESCS variable) and migration background (ORIGIN variable) are considered. Both characteristics are considered at both student and aggregate class level. The ESCS variable has been considered by quintiles to allow a clearer and more immediate reading of the results. While the migratory origins variable categorises students between those who are native Italians, those who are first-generation foreigners and finally those who are second-generation foreigners.

Regarding the dependent variables, teachers occupational instability, we rely on two characteristics of teachers:

- *the employment contract*: this refers to the contractual situation that the teacher has vis-à-vis the school where he or she works. The reason for this choice is to differentiate those who work with a permanent contract from those who instead find themselves in a precarious situation, a phenomenon that is precisely associated with higher mobility among schools;
- *permanence within the school*: this characteristic is desirable in our analysis because it allows us to differentiate between those who are "rooted" in the school and those who have no roots in the institution where they currently work – uprooted. Lack of rootedness, in fact, is synonymous with less knowledge of the working and organised context in which one operates (Creemers and Kyriakides, 2012) going to be a factor affecting the quality offered by the teacher to the students. In our analysis, three different characterisations of teachers are considered: the "entrenched" is the one who has been in the institution for more than four years; the "recent" is the one who has been in the institution for two or three years; finally, the "newcomer" is the one who has been in the institution for one year or less.

From these two factors, which were analysed separately and then combined with each other, a reduced set of analytical variables was constructed in the final data. These variables represent several types of teachers, each with their own characteristics, which help to clarify the different nuances of the phenomenon of teacher employment instability, to which students are exposed:

- *substitute teacher*: this is a teacher who does not have a permanent contract of employment and therefore cannot be so defined as "tenured". In this case, both teachers with an annual assignment and those with an assignment of less than a year are included in the definition of substitute;

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– *newcomer*: this is a teacher who has just arrived at the institution where he or she currently works, no matters with which kind of contract. As previously defined, such a teacher has been changing schools for a year or less. It represents the most explicit condition of teacher turnover;
– *precarious*: this is a teacher who is both a substitute and a newcomer. In more detail, this situation is a combination of the first two circumstances. Thus, the teacher is a substitute teacher, i.e. he or she is on a fixed-term contract and is also a newcomer, i.e. he or she has been at the institution where he or she currently works for a year or less. He represents the least desirable situation in the eyes of the students and their learning;
– *uprooted*: represents a teacher who is not rooted. It is a situation that amplifies the arena of rooted teachers. In fact, uprooted are those who either have a fixed contract or find themselves teaching in the same school for less than four years. Of course, those who find themselves having both characteristics at the same time are also part.

3.2. Logit models

Dwelling on the methodology used to capture the exposure of the phenomenon of teacher occupational instability with respect to students and their socio-economic and migratory characteristics, binomial logistic regression models were implemented. In the context of the analysis, the logit model was used to understand the exposure of students to different phenomena about teacher precarity. Specifically for the realisation of the analyses, several types of logit were adopted according to the independent variables taken into account. All models correct standard errors for clusterization at class level. In addition, the analyses also included geographical area as a context variable to highlight whether there were any substantial differences between the Italian territories.

The models used are explained below:
– *model 1*: analyses the differential exposure of the phenomenon with respect to years and school grades holding constant the geographical area;
– *model 2*: taking into account the student's ESCS, it estimates the association of the phenomenon with the student's socio-economic background, first at a general level and then by school grades;
– *model 3*: considering the migratory origin of the student, it calculates the probability of exposure to the phenomenon by students of foreign origin compared to students of Italian origin. This probability was analysed both by overall value and differentiated for each school grade.

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Each model was replicated separately for Italian and mathematics in order to highlight potentially different association mechanisms between the two disciplines.

4. Results

We now present the results of our analyses. The results are organised according to the specific objectives of the study, i.e. intensity of the phenomenon, association with socio-economic background and finally association with migration background.

4.1. The phenomenon magnitude

Starting from Figure 1, we notice that the phenomenon magnitude differs among definitions also according to the school grade considered. The first result that emerges is the importance of distinguishing the different types of occupationally unstable teachers within the Italian school system. If only simple substitute teachers would have been considered, the evidence not have emphasise the related teachers turnover. In addition, we notice that the percentage of students exposed to the phenomenon of certain characteristics of teacher instability is always a minority. However, this minority is not negligible, indeed in some definitions of the phenomenon, we can see how the percentage of exposure increases considerably. Further evidence that we can see at a general level from the graphs is the fact that the situation in mathematics is overall worse than in Italian.

Analysing the general trends along time, we first note a progressive increase in the probability of students being exposed to teachers with undesirable conditions. This indicates a worsening trend in the school system during the assessment years. Considering that teachers' response rates to the questionnaire are stable over time (see Table 1) we can infer that probably this negative trend over time stems from a higher proportion of unstable teachers in the population.

When comparing the different definitions, it can be seen that the trends are heterogeneous. The tendency to have substitute teachers is almost always similar to that of having newcomers as teachers, although the two definitions do not match. The tendency to have a precarious teacher is physiologically lower, this being the combination of the two previous situations. This result implies that the percentage of exposure to the worst situation, i.e. having both a substitute and a newly arrived teacher, is more limited.

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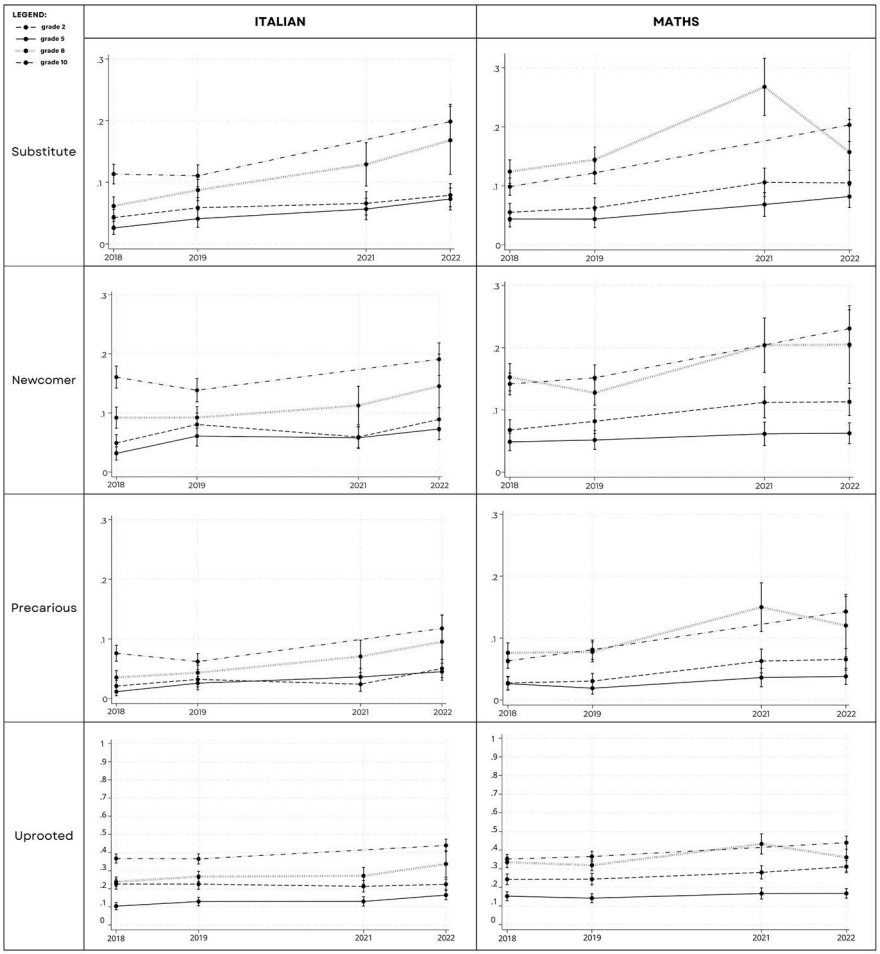

Fig. 1 – Exposure to teachers under different stability conditions by grade and year, for the same geographical area (probability, students)

With regard to the last variable taken into consideration, that of an uprooted teacher, we find a much larger audience involved. In this case, one can see that the percentages for all grades are significantly higher and lead to highlight how a large percentage of Italian students are exposed to the turnover phenomenon, which, as already mentioned in the previous chapters, is common behaviour in our educational system. Examining the situation at a general level, it can be seen that the better situation for students is present for grade 5, which is found with lower percentages, even compared to grade 2. The worst situation is instead present for grade 10, which is found to have

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percentages of exposure to phenomena even three times higher than those of grade 5. In addition, there is a significant difference between Italian and mathematics for secondary schools.

4.2. Associations with students' socio-economic background

Associations with socio-economic background are analysed using the ESCS variable. For the sake of clarity in presenting our results, we divided the ESCS variable into quintiles. Analysing the general trends that Figure 2 shows regarding the exposure to teachers in different stability conditions by quintiles of ESCS for the same year, school grade and geographical area, we note a decreasing likelihood of having teachers in unstable conditions as ESCS increases. In the graphs, indeed, the lines always tend to have a negative slope, although its magnitude is not so relevant. The biggest differences are at the tails of the ESCS distribution, i.e. between first quintile and second, and between fourth and fifth. That is, those in the extremes experience conditions have a greater differential exposure to teachers in different stability conditions.

Analysing the general trends of Figure 3 among grades 5, 8 and 10 (grade 2 not being considered due to the lack of ESCS), we notice a clear difference between grades, with a large association of exposure with ESCS quintiles for grade 10, compared to grade 8 and even more so compared to grade 5. For grade 5, the situation is indifferent with respect to ESCS quintiles, with discrepancies almost always around one percentage point. Regarding mathematics, grades 8 and 10 are remarkably similar and markedly different from grade 5. Grade 8 displays a stronger association even than grade 10 for some definitions. Also here, the greatest differences are found at the extremes of the ESCS quintiles. In Italian we note for the exposure to teachers with sub-optimal stability, that the first quintile displays percentages higher than the rest of the population.

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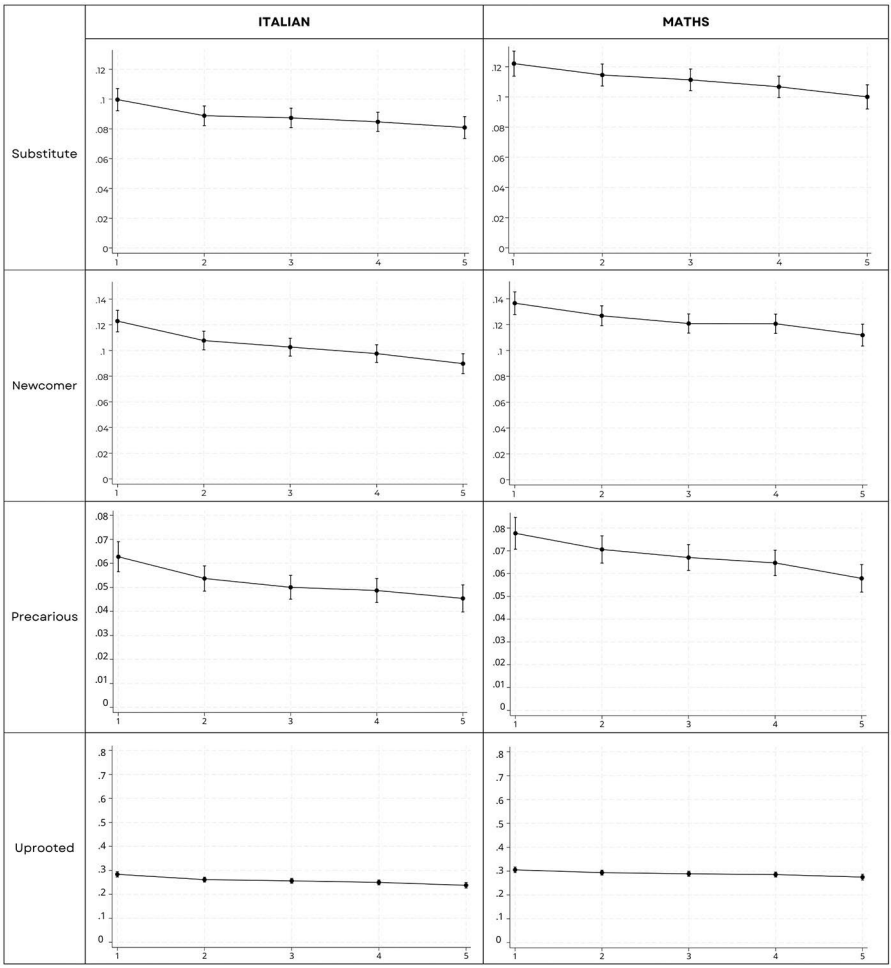

Fig. 2 – Exposure to teachers under different stability conditions by quintiles of ESCS, for the same year, grade and geographical area (probability, students)

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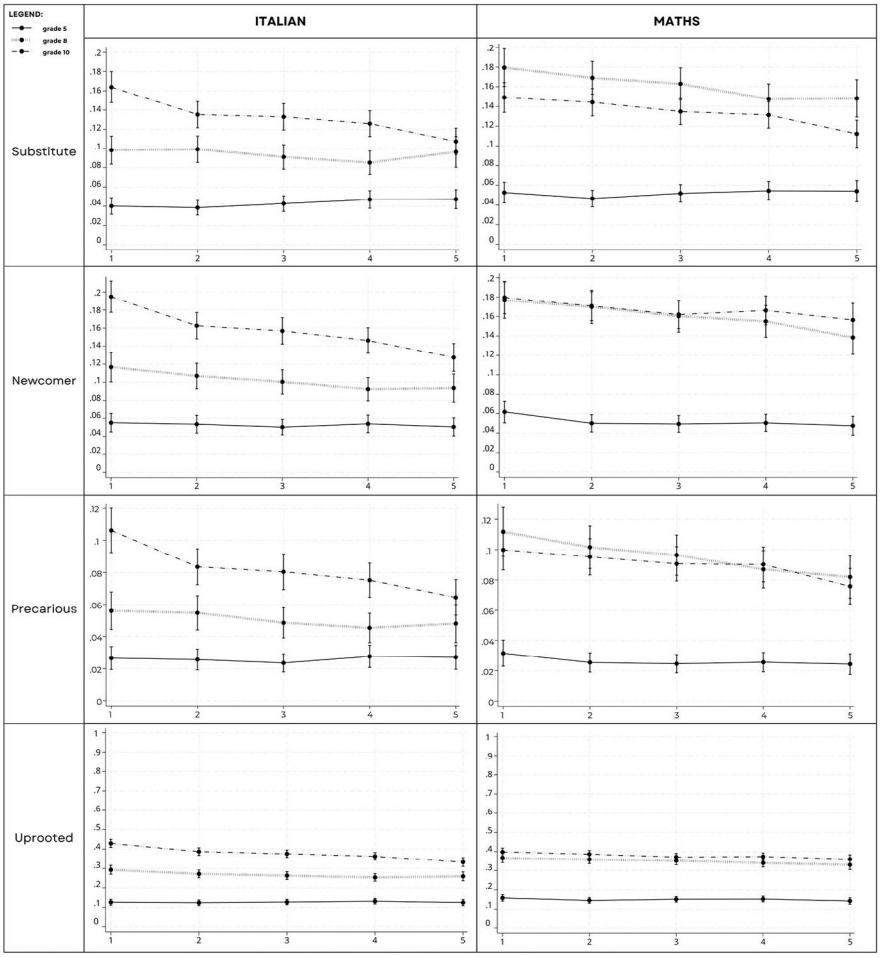

Fig. 3 – Exposure to teachers under different stability conditions by quintiles of ESCS and grade, equal year and geographical area (probability, students)

4.3. Associations with students' migratory background

Figure 4 shows that there is a trend toward larger exposure to teachers in different conditions of non-stability for first-generation foreign students, with an improvement toward the better condition of Italians for second-generation foreign students. Differences in exposure to teachers in different conditions of stability with respect to students' migratory origin never exceed 3.5 percentage points. The probability of having an unstable teacher is

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around 10 percentage points for substitutes and newcomers, while it is lower if we consider the precarious ones.

Focusing on Figure 5, it is immediately noticeable that grade 10 tends to have a much more pronounced discrepancy with respect to students' migratory origin than the other grades, showing almost no influence.

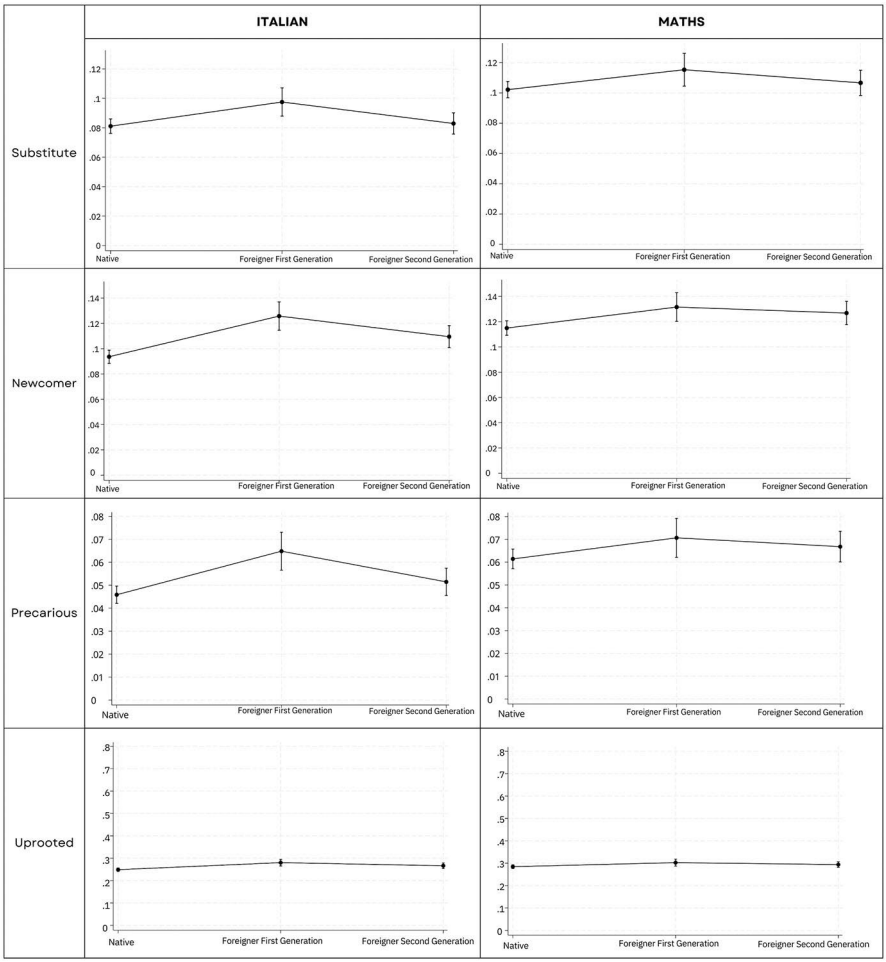

Fig. 4 – Exposure to teachers under different stability conditions by origin, year, grade and geographical area (probability, students)

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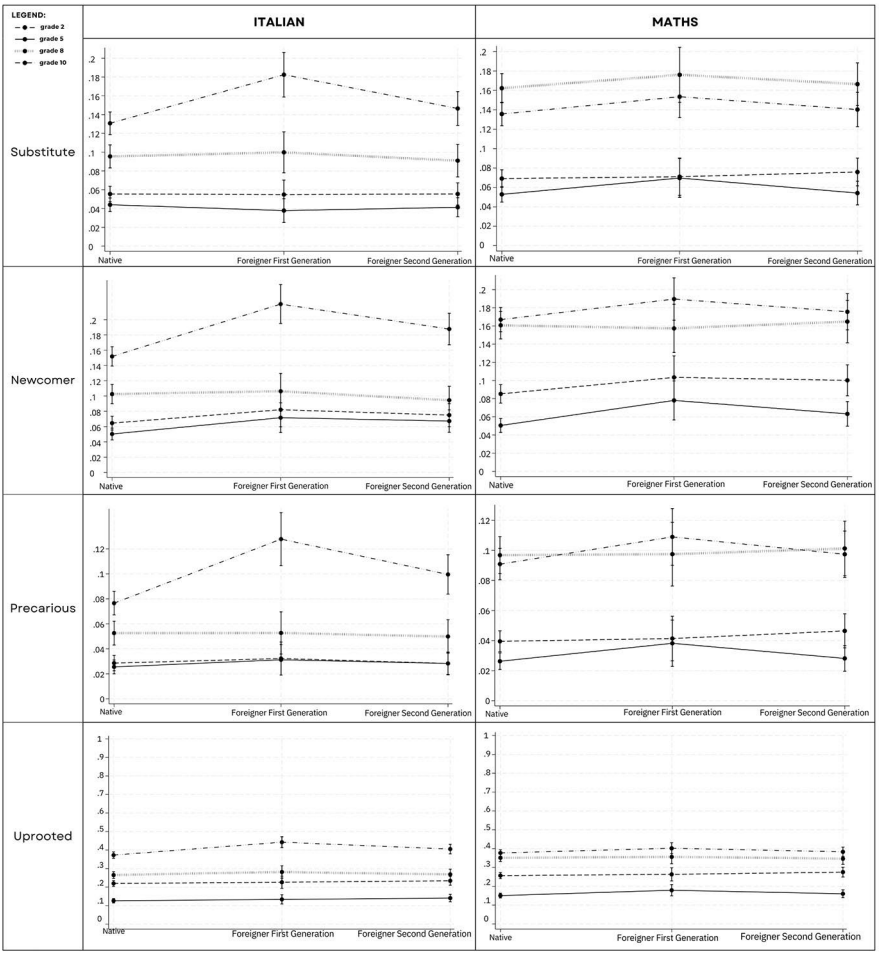

Fig. 5 – Exposure to teachers in different stability conditions by origin and grade, equal year and geographical area (probability, students)

5. Concluding remarks

This study assessed whether there were differences in the probability of exposure to teachers with characteristics of employment instability within the student population, hypothesizing that this may be a mechanism of the school system generating tertiary effects. We focused on a specific area of interest: teacher employment instability in association with students' socio-economic and migratory background.

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First, our analyses found a high percentage of students experiencing the phenomenon of teacher turnover. Next, we found that the phenomenon of teacher employment instability shows different entities of manifestation depending on its definition. Being uprooted – that is, teachers either on a fixed contract or for less than four years in the current school – is found to have relevant percentages of students involved for both Italian and mathematics, increasing as the school grade increases. It was also noticed that over time (2018-2022) all phenomena increased.

Second, a larger exposure to occupationally unstable teachers was found for students from poorer socio-economic backgrounds. This tendency is present at the absolute level with modest values, but with noteworthy concentrations. This association is null at the elementary school level, but it becomes relevant in secondary school, with greater evidence for mathematics than for Italian (for grade 8).

Thirdly, we observed that the association between teachers' employment instability and students' migratory background is concentrated almost entirely on grade 10, probably due to the tracking phenomenon related to students' high school choice.

In conclusion, the evidence provided allow us to develop a systemic evaluation of teachers' allocation and to rethink the underneath organizational arrangements. Policies should be developed in order not to avoid an unfair concentration of occupationally stable teachers in the easiest school settings, and consequently of the least experienced teachers in the poorest and most difficult settings. Despite the importance of valuing teachers' desire for mobility towards more preferable school settings, this cannot come at the price of tertiary effects on students.

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5. How are inequalities generated in schools? An attempt to construct research tools and data

by Giovanni Abbiati, Gianluca Argentin, Patrizia Falzetti, Tiziano Gerosa, Giuseppina Le Rose, Elisa Manzella, Emmanuele Pavolini

In recent years, there has been growing interest in the quantitative study of the mechanisms underneath inequalities' reproduction in the school system. From a theoretical standpoint, the concept of "tertiary effects" (Esser, 2016) has been conceptualized, referring to the influence of the school system and its actors on inequalities in learning and educational pathways. At the same time, empirical studies focused on various school mechanisms reinforcing the reproduction processes of educational inequalities, both in Europe and in Italy (Argentin and Pavolini, 2020). This evolution has been made possible by the creation and dissemination of large administrative datasets in European countries, built for evaluative purposes. Therefore, it is useful to reflect on these issues at the conference promoted by INVALSI.

As often happens, secondary analyses of information coming from standardized assessments display disadvantages too. Indeed, collecting information about the malfunctions of the school system by public evaluation institutions raises several issues. The purpose of our contribution is to describe an attempt to integrate administrative data with data collected ad hoc by the research group, in order to enable new insights about educational inequalities and the mechanisms generating them.

A pilot online survey was conducted on a random national sample of 100 Italian lower secondary schools, aiming to interview school principals, teachers, and parents of students. The autonomy of this data collection, compared to the institutional one developed for evaluative purposes, provided us with ample freedom in designing new questions, scales and items. We tested them with the different targets involved in the survey. Less than two-thirds of the schools invited to participate responded to the survey, leading to selected samples of principals, teachers, and parents. These samples are not large enough to allow inferences about the related populations, but sufficient

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to validate the measurement tools we used and to investigate the causes of self-selection into the sample of respondents.

The proposed contribution develops two separate analyses.

Firstly, we investigate the sample self-selection process of schools participating in the survey by relating administrative data on the original sample to administrative data on the subset of respondents. It is thus observed that the self-selection of schools appears to be neutral concerning characteristics of the schools/students' populations. The response rates of teachers and parents are, instead, closely linked, an indication – we hypothesize – of the commitment of the school principal and school offices to promoting the initiative. Second, we illustrate a potential application of the survey to the case of school guidance advice, a topic on which a growing scholarly literature is focusing.

Beyond the presentation of these pilot survey results, we draw implications for future large-scale surveys on inequalities in the school system.

In anni recenti, è cresciuto l'interesse verso lo studio quantitativo dei meccanismi di riproduzione delle diseguaglianze nei contesti scolatici. Da un punto di vista teorico, sono stati concettualizzati gli "effetti terziari" (Esser, 2016) quale influenza del sistema scolastico e dei suoi attori sulle diseguaglianze di apprendimento e di percorso scolastico. Al contempo, hanno acquisito spazio, anche in Europa e pure in Italia, studi empirici che guardano proprio ai diversi meccanismi scolastici di rinforzo dei processi riproduzione delle diseguaglianze educative (Argentin e Pavolini, 2020). Ciò è stato possibile grazie al fatto che anche nei Paesi europei sono andati creandosi e diffondendosi grandi basi di dati amministrativi, costruiti a fini valutativi di sistema. Pare per questo utile portare riflessioni in merito nella conferenza promossa da INVALSI.

Come spesso accade, le analisi secondarie di queste informazioni non presentano solo vantaggi: la raccolta di informazioni cruciali per studiare i processi di malfunzionamento della scuola da parte di istituzioni valutative pubbliche presenta infatti molteplici problematiche. Scopo del nostro contributo è raccontare un tentativo di integrazione di dati amministrativi e dati raccolti ad hoc dal gruppo di ricerca, proprio al fine di rendere possibili nuovi approfondimenti sulle diseguaglianze educative e sui meccanismi che le generano.

È stata condotta una survey on line pilota su un campione casuale nazionale di 100 scuole secondarie di primo grado italiane, provando a intervistare, allo stesso tempo, dirigenti scolastici, insegnanti e genitori degli studenti. L'autonomia di questa raccolta dati, rispetto a quella istituzionale con fini

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valutativi di sistema, ci ha permesso ampi margini di libertà nell'ideazione di domanda da testare con i diversi campione di oggetti coinvolti nelle survey.

Hanno risposto all'indagine meno di due terzi delle scuole coinvolte, con campioni selezionati di dirigenti, insegnanti e genitori, con numerosità tali da non permettere inferenze sulle popolazioni, ma sufficienti per validare gli strumenti di misurazione impiegati e ragionare sui fattori di autoselezione nella compilazione.

Nel contributo proposto vengono sviluppate due analisi, con finalità distinte. In primo luogo, indaghiamo il processo di autoselezione delle scuole nella partecipazione alla rilevazione, ponendo in relazione dati amministrativi sul campione inizialmente e dati amministrativi sul sottoinsieme di rispondenti. Si rileva così che l'autoselezione delle scuole sembra neutra rispetto a caratteristiche note della popolazione scolastica. I tassi di risposta di insegnanti e genitori sono invece strettamente legati, un'indicazione – ipotizziamo – dell'impegno del dirigente e degli uffici scolastici nel promuovere l'iniziativa. In secondo luogo, si illustra una potenziale applicazione della survey al caso dell'orientamento scolastico, un tema su cui si sta concentrando una crescente letteratura scientifica. Dalla presentazione di questi risultati dell'indagine pilota, si traggono implicazioni per future survey di approfondimento su più ampia scala.

1. Introduction

Despite the mass schooling and increased school participation even among disadvantaged social classes, inequalities in education and disparities in educational outcomes have persisted over time (Boudon, 1973; Breen and Goldthorpe, 1997; Ballarino and Bernardi, 2020). There is a relatively broad literature that has investigated how educational outcomes are affected by students' social origins (Goldthorpe, 1996; Becker, 2003; Goldthorpe, 2007; Barone *et al.*, 2010; Ballarino and Bernardi, 2020). According to Boudon's conceptualization (1973), this influence takes the shape of "primary effects", and "secondary effects" that are social, economic, and psychological mechanisms that reinforce class differences and reproduce inequalities in educational opportunities based on social origins.

In particular, primary effects pertain to educational inequalities linked to the socio-economic and cultural background of students, directly influencing academic performance and educational choices. They are understood as the consequence of a complex interaction between educational institutions and the cultural, economic, and social resources of individuals and their families

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(Jackson, 2013; Argentin and Pavolini, 2020). Among the factors underlying primary effects are the home environment and the associated economic, cultural, and social resources; health and nutrition; genetics; and cultural capital (Jackson, 2013; Erikson and Jonsson, 1996; Argentin and Pavolini, 2020). Students from a lower social status achieve a lower educational level compared to their higher-status peers due to their cultural background, such as linguistic skills (Shavit and Blossfeld, 1993; Breen *et al.*, 2009; Jackson, 2013; Argentin *et al.*, 2019). On the other hand, secondary effects, with equal academic performance and educational outcomes, concern the inequality in educational choices at critical junctures in educational careers. They are connected to the decision-making processes of students and parents regarding educational investment, particularly in terms of the level of education attained by students (vertical stratification) and the possibility of choosing a specific course of study (horizontal stratification). For example, two students with similar academic performance but different social backgrounds may achieve different educational qualifications due to varying educational choices made within their families at critical junctures in their educational careers. Among secondary effects are mechanisms related to the home environment, such as the availability of economic resources influencing the perception of costs and benefits associated with different paths (Jackson, 2013). For instance, economic resources can be invested directly (in tuition fees or living costs) or indirectly (private lessons or supplementary courses) to support academic paths (Erikson and Jonsson, 1996).

In recent years, the literature has started to focus also on the presence of a third set of mechanisms connecting students' performance to their social origins. Schneider (2014) and later Esser (2016) have defined this additional set of effects "tertiary effects". With these terms they refer to the role that institutions and their actors can play in reproducing inequalities in education (see Fig. 1). It involves incorporating into the framework primary and secondary effects, all those attitudes and behaviors that come into play at the school level and influence the processes of choosing educational careers (Argentin and Pavolini, 2020). These attitudes and behaviors directly concern expectations, evaluations, and recommendations that teachers and other institutional actors implement towards their students. What is emerging in the literature is a concept that brings together these aspects, in the logic of tertiary effects, highlighting the role of institutions and interactions between actors in institutions in the reproduction of inequalities. In the perspective of tertiary effects, the actors playing a role in reinforcing and reproducing educational inequalities are no longer just families, as seen in primary and secondary effects, but also schools (teachers and school principals) through the sorting processes of stu-

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dents into different educational paths, in line with the theoretical perspectives of Bourdieu and Passeron (2006) and Bowles and Gintis (1976).

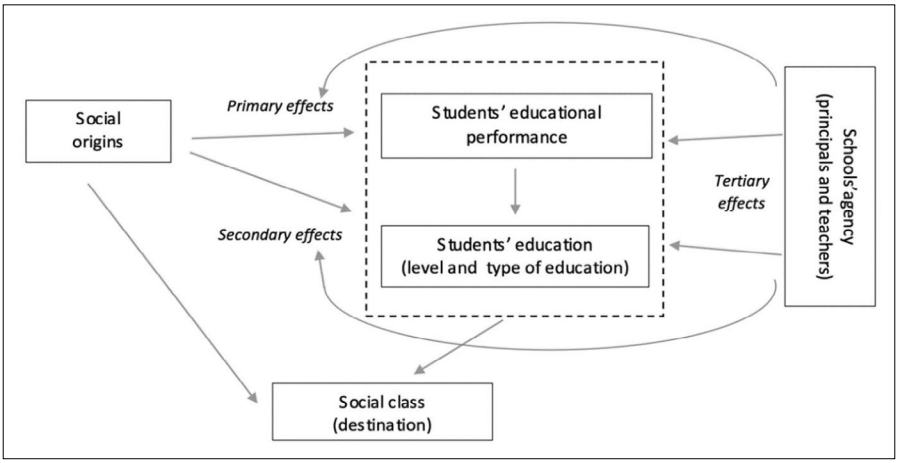

Fig. 1 – The role of primary, secondary, and tertiary effects in educational inequalities

Source: Argentin and Pavolini (2020)

Tertiary effects can be based on several micro-mechanisms. The present contribution reports an ongoing broad research aimed at studying in a novel and integrated way tertiary effects. In particular, it focuses on explaining our research design and reporting on how we tested the research tools we have adopted and the limitations we found, and finally it illustrates, by analyzing a specific micro-mechanism (how school guidance to choose the upper secondary school track works as an interaction between students' social background, families and teachers), how tertiary effects work.

2. The research design

The goal of this study was exploratory in nature, aimed at evaluating, on one hand, the efficacy of the questionnaire administration method (i.e. its challenges and critical aspects), and, on the other hand, the reliability of the items and scales employed within the questionnaires to measure the phenomena under scrutiny.

The questionnaire was tested on a national random sample of 100 Italian lower secondary schools. The sample was drawn by INVALSI employing the same criteria commonly used by the Institute for generating school samples

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for national surveys. Specifically, a stratified probabilistic sample of schools was selected within each region (for further details see Falorsi, Falzetti, and Ricci, 2019)[1]. In line with the aim of the survey, that is to precisely reconstruct the network of the teaching body, all 8t^{h} grade classes were included in the study (on average, 6 classes per school).

This procedure translated on a sample of 100 schools, 11,367 students (i.e. families), and a number of teachers estimated within the range 2,800 and 3,800. In relation to this last point, we could not precisely assess the number of teachers ex-ante due to the decentralized collection of data on teacher allocation to classes and sections. Figure 2 shows the territorial distribution of the sample. Respondents were explicitly informed that the survey aimed, among other goals, to calibrate the assessment instruments.

Fig. 2 – The territorial distribution of the sample

[1] In contrast to INVALSI's survey procedure, which entails selecting a two-stage probabilistic sample, stratified at the first stage for schools and at the second stage for classes, the extraction process in this study involved the school level only.

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The pilot survey was administered online through the creation of a dedicated and unique web link for each school. The questionnaire distribution was accompanied by two phone calls to the school principals: one initial call to inform about the survey and a second reminder call in case of non-response from the institution. While originally planned for the late autumn of 2022, the data collection took place between the end of May and the first part of July 2023. This delay has been motivated by the completion of the various processes related to the issuing of privacy statements and data protection procedures in a research environment characterized by multiple institutions.

In total, three questionnaires were administered in each school: one targeting school principals, a second for teachers, and a final one for students' parents. The questionnaire for principals collected demographic information (age and gender) of the principals, information regarding training and recruitment within the school, details about teaching practices and evaluation methods, as well as retrospective information about the academic year 2022/2023.

Conversely, the questionnaire for teachers gathered demographic information (age, gender), current teaching workload, details about how teachers were assigned to specific classes, information about other teachers in the class council, procedures for assigning grades and formulating school guidance advices, processes underlying student allocation between classes during the transition from primary to lower secondary school, and subsequent transitions, among other relevant aspects.

Finally, the questionnaire for parents collected information about family characteristics, school and section choice, parental involvement in their children's home learning activities, level of participation in school life, and their children's cultural, sports, and extracurricular activities.

3. Preliminary results

3.1. Response rates

The primary focus of interest of our research regarded the response rates to the questionnaires. Estimating the level of engagement among the involved actors prior to field operations posed a considerable challenge, given the methodological innovations underpinning the survey. From a substantive standpoint, our research breaks new ground by gathering data from three distinct actor groups: teachers, parents, and school principals. While such research endeavors are not unprecedented, historically, they have re-

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lied predominantly on qualitative methodologies or have been conducted on markedly limited samples. It is noteworthy that our approach diverges from traditional practices by extending the teacher questionnaire to encompass teachers across all subject areas and contractual frameworks, in contrast to the conventional focus on Italian and mathematics teachers typical of Italian and international surveys (e.g., TIMMS, PIRLS, INVALSI).

Moreover, our methodology incorporates innovative contact methods. The advent of school electronic registries accessible to parents in recent years has streamlined communication between school administration and parents, circumventing traditional intermediaries such as class representatives, teachers, or student diaries. Notably, the utilization of electronic records substantially reduces survey costs and facilitates direct incorporation of survey links into email correspondence.

Nevertheless, this wave of innovation raises questions about their efficacy in adequately engaging families and implementing effective strategies to incentivize participation among parents, school principals, and teachers.

Table 1 provides a breakdown of the number of respondents and response rates according to survey type and geographical area. As a measure of variability, we have included in the table the highest value recorded for the response rate of teachers and parents at the school level.

Tab. 1 – Number of respondents and response rates: total and by geographical area

Italy	*N° (universe)*	*Respondents*	*% respondents*	*Max % of respondents*
Principals	100	56	56	
Families	11,367	1,460	12.8	65.4
Teachers	2,770-3,878	632	23.1-16.5	100-71.4
Northern Italy				
Principals	42	25	60	
Families	5,005	767	15.3	65.4
Teachers	1,195-1,673	279	23.3-16.7	84.4-60.3
Central Italy				
Principals	19	12	63.2	
Families	2,350	314	13.4	41.7
Teachers	550-770	129	23.4-16.8	76-54.3
Southern Italy				
Principals	39	19	48.7	
Families	4,012	379	9.4	45
Teachers	1,025-1,435	224	21.9-15.6	100-71.4

Source: Projects' data

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The aggregated response rate, calculated as the percentage of schools that participated at least minimally in the initiative at the school level, stands at 69%. However, this figure masks significant disparities across the three populations: the response rate among school principals stands at 56%, while that of teachers is estimated at around 17%-23%, and parents' response rate is 13%. Disaggregating the results by macro-area reveals some territorial differences: response rates are similar in the Northern and Central regions for all three populations considered. In the South, however, both the response rate of school principals (48.7% compared to rates of 63.2% in the Center and 60% in the North) and that of parents (9.4% compared to values of 12.8% and 13.4%) are lower. Conversely, teachers' responses are relatively consistent across the country. If we focus on the last column, it can be observed that there are schools where family participation exceeded 40% (with a peak of 65% in the North) and cases where teacher participation was substantial, with estimated levels exceeding 70%, as will be further discussed later.

Fig. 3 – Distribution of sampled schools by participation status

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Figure 3 shows the territorial distribution of the schools that agreed to participate (black dots) and of those who did not (gray dots). Within each macro-area, significant differences can be found across regions. For instance, examining the data on overall participation in the survey, a stark contrast is evident between the case of Sicily (where 5 out of 6 schools participate) and Sardinia or Apulia (0 out of 3 in the former and 1 out of 5 in the latter case). Similarly, in the Central-Northern regions of the country, notable differences are observed between even contiguous areas, such as those between Veneto (5 out of 5 schools participating) and South Tyrol (1 out of 3).

When the attention is turned to the variability in response rates among teachers and parents, first and foremost, it should not come as a surprise that the participation of these two groups was lower compared to that of school principals, as the contact with teachers and parents has been mediated by the principals themselves. To understand the reasons behind the variability in participation highlighted earlier, we correlated the data on teacher response rates[2] and parent response rates with several contextual variables at the school level: school size (proxied as number of eighth-grade classes); average scores at the INVALSI Italian, Mathematics, and English tests for the school year 2022/2023; average value of the ESCS (Index of Economic, Social, and Cultural Status) of students; percentage of students with migratory backgrounds (both first and second generation).

Finally, we examined the relationship between the two response rates. The results of the analyses are presented in Figure 3.

Graphs in the left-hand part of Figure 4 show scatterplots and correlation coefficients between the variables descripted above and teacher response rates. Graphs on the right-hand side present the corresponding analyses using parent response rates. The correlation coefficient value is provided within each box.

[2] We use here the response rate calculated using the lower estimate of the number of teachers by school. Given the nature of the correlation index, results are not affected by the choice of the estimate.

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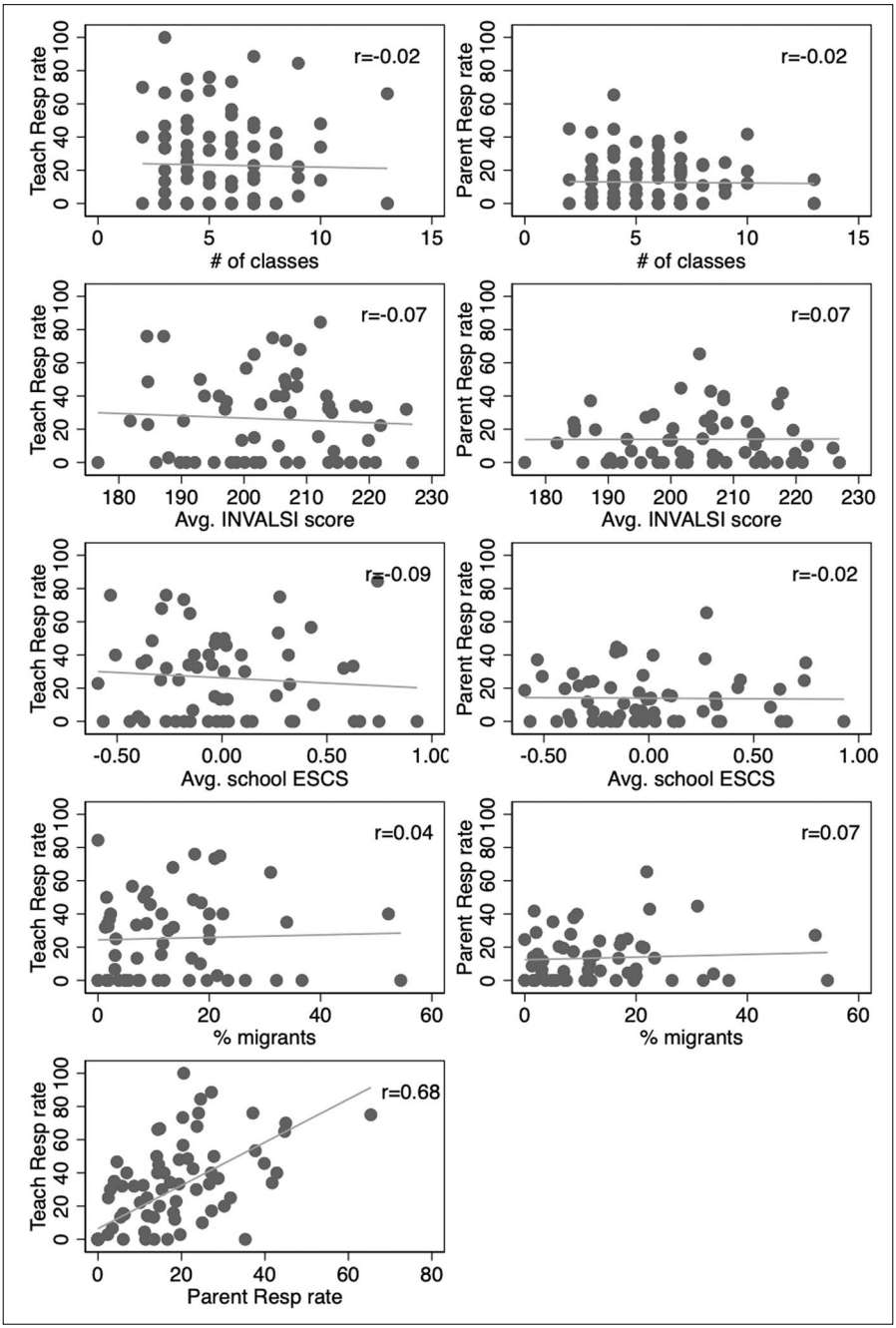

Fig. 4 – Response rates according to different characteristics of schools

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Two main phenomena can be observed. Firstly, the variables commonly used to describe school contexts appear to be poor predictors of the response rates of parents and students. Smaller schools did not exhibit higher response rates compared to larger ones, contrary to what one might expect given the mediated nature of the invitation. The same is true for characteristics of the school catchment area, which exhibit values of the Pearson correlation coefficient equals or very close to 0. This result is particularly remarkable for parent response rates: schools with catchment areas characterized by economically deprived families, or with a higher presence of immigrant students, or showing lower standardized test scores, do not have lower response rates compared to others, despite factors such as the questionnaire not being available in languages other than Italian and having an estimated duration exceeding 20 minutes[3].

Second, it is noteworthy instead the high correlation coefficient value between teacher and parent response rates (0.68), which we interpret as a sign of the importance of engagement efforts by principals and the administrative towards both families and teachers, a phenomenon that seems to cut across different contexts. These results indeed challenge the common belief regarding the greater ease of conducting research in more affluent school settings.

3.2. An empirical application: school guidance to choose the upper secondary school track and students' social background

A topic related to tertiary effects that is gaining increasing attention is the role of educational guidance advice on the reproduction of educational inequalities. Families receive such advice from the class's teaching board during the last year of the lower secondary cycle. Such advice should inform and direct families to the best choice for their children's further educational career, indicating one or more suitable options for the student, according to his or her own interests and proficiency. Even though families are not obliged to follow the guidance advice, this tool plays a crucial informative role for students and parents, given the increasing diversification of the upper secondary paths that marked the last two decades (De Feo and Pitzalis, 2017, 2018).

The study of guidance advice is particularly interesting for the purpose of our survey. Educational guidance, in fact, is provided to families precise-

[3] These results are robust to the exclusion of outliers.

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ly at the onset of tracking within the Italian education system, marking the turning point in careers that are significantly influenced by the high degree of institutional stratification of our country (Schizzerotto and Barone, 2006; Ballarino and Panichella, 2021). This choice also implies a long-term investment, given its repercussions on the possibility of pursuing university studies and the related professional pathways (Settembrini, 2019; Vergolini and Vlach, 2017). Through guidance advice teachers provide crucial information that directly influences choices, especially for families with limited cultural capital and those with a weaker understanding of the education system. In this sense, teachers serve as gatekeepers to educational opportunities, and their role become even more apparent during this moment (Besozzi, 2006; Colombo, 2017).

Research on this practice has consistently highlighted how guidance advice is not formulated neutrally. Students with similar academic performance are suggested different educational pathways based on their socio-economic and ethnic backgrounds (Checchi, 2010; Bonizzoni *et al.*, 2014; Romito, 2016; Argentin *et al.*, 2017; Aktaş *et al.*, 2022; Batruch *et al.*, 2023; Manzella, 2023), with native students and students from more educated or wealthier families more likely to be suggested a generalist school (*licei*), while their peers are directed towards technical and vocational schools. This pattern is particularly evident among students with average performance, where discretion in guidance might play a more significant role (Romito, 2016; Argentin and Pavolini, 2020; Manzella, 2023).

Much of this research draws conclusions based on indirect evidence (i.e. how the association between performance and guidance varies according to social background) or is based on ethnographies on a few schools (e.g. Romito, 2016). Thanks to our survey we can deepen our understanding by asking directly to the teacher's questionnaire how this practice is enacted, which criteria are taken into account when formulating the advice, and how the advice is communicated to the student and the family.

One of the results of previous research on guidance advice is its low degree of standardization across schools and great heterogeneity of connected practices (Manzella, 2023). While, as a general rule, guidance advice is formulated within the teachers' council of each class, no specific rule is followed as concerns cases that need extra-attention, in which discretion might play a bigger role. In table 2 we report the results of our survey to the question "When faced with uncertain or controversial guidance advice, how much weight does the opinion of these people take in the discussion?". The results testify the great degree of variability across schools. While the opinion of the teachers of the class is almost always taken into account, as

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expected, the role of other relevant actors is variable in the weight their opinion has, and even in their presence in the process. The opinion of teachers in charge of coordinating guidance activities, that should have – in theory –, a specific expertise in this field is valued as not that important in 30% of cases; in 12.7% they are even excluded or are not asked to participate in the process. This result is in line with the lack of professional knowledge or skills that the teachers serving in this role appear to have (*ibid.*). Similar results are found for school psychologists, which could represent potentially a key figure to involve, while school principals have an even lower say. Interestingly, the opinion of the student him/herself is considered very relevant by a vast majority of respondents, much more than the opinion of the parents, on whose relevance our sample of respondents is equally split. Such heterogeneity confirms the lack of standardization of this process that might open the door to arbitrary judgements.

The lack of guidelines that marks this process is mirrored also in the importance that the teachers attribute to a wide set of criteria that we have submitted to our respondents. We asked the teachers to rate on a scale from 0 to 10 the importance of a set motivations related to the proficiency of the student (school proficiency, risk of subsequent failure, maximization of future higher education opportunities), preferences (of the student or of the family), and family constraints (older members experience, geographical proximity, possibility of supporting the student if in need). Results are presented in figure 5 by means of boxplots. The three criteria related to students' proficiency are those to which the teachers consistently attribute higher weight on average (median: 8/10, with limited variability), followed by students' preferences. Items related to family preferences and constraints show a median value always equal or inferior to 5, in some cases showing a considerable variability. For instance, 42% of respondents rate family preferences higher than 6/10, and about 32% did it for both the possibility of having family support and being close to the suggested school. A small minority of 13% rates the experience of older family members higher than 6/10.

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Tab. 2 – Importance of different actors in case of uncertain/controversial guidance advices (N = 632)

	Not at all/ not much	*Quite/a lot*	*Do(es) not participate*	*Total*
Class coordinator (teacher)	7.8	92.2	0.0	100.0
Teacher belonging to the subject that characterizes the preferred track	2.7	97.0	0.3	100.0
All the other teachers	5.0	94.5	0.5	100.0
Teacher serving as school guidance coordinator	30.0	57.3	12.7	100.0
School psychologist	34.5	47.3	18.2	100.0
School principal	50.3	36.9	12.8	100.0
Parents	49.8	46.4	3.8	100.0
Student	12.0	85.9	2.1	100.0

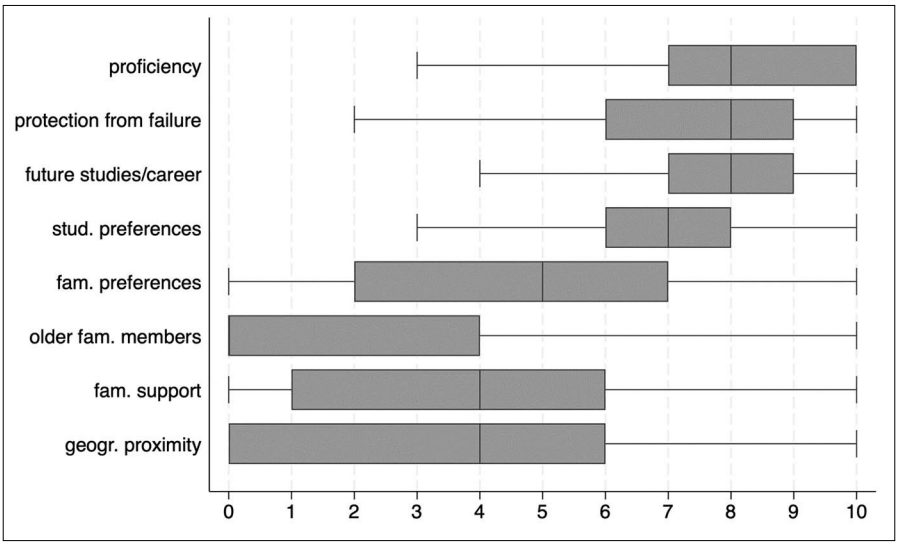

Fig. 5 – Importance attributed to factors for the formulation of guidance advice

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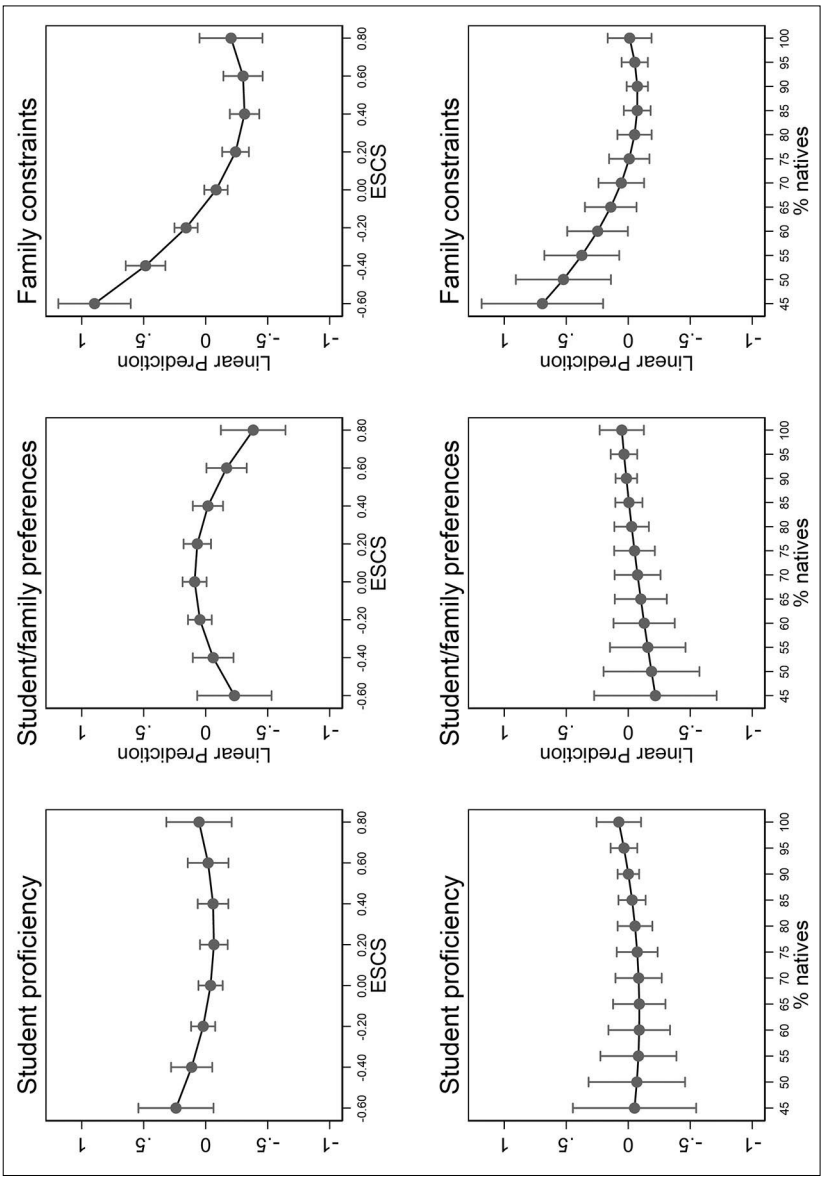

Fig. 6 – Association between school average ESCS, percentage of natives students and advice formulation factors

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Principal component analysis performed on this battery of items reveals that the responses of the teachers can be explained by three underlying factors: proficiency, preferences and family constraints[4]. We extracted a standardized index for each factor and regressed it on average ESCS of the school, controlling for the region to which the school belongs. Then, we performed the same analysis using the percentage of first and second generation migrant students enrolled in the school instead of average ESCS. A quadratic term for both ESCS and percentage of migrants is included in the models to capture non-linearities. Despite the high uncertainty surrounding the estimates, there is a clear result emerging from this descriptive analysis, which is the strong correlation between the composition of the students' body and the tendency of teachers to consider familiar constraints when formulating the advice, but only for the left-hand tail of the distribution, i.e. schools characterized by a low percentage of natives or an average ESCS lower than the national mean. The relationship with the student body is flat for the schools serving an average to predominantly native/affluent student body. The association with ESCS/native proportion with the factors related to proficiency and preferences do not seem to follow a particular pattern. In sum, teachers incorporate elements in their advice information on family constraints, but only in contexts with situations of disadvantage. These results are consistent with previous qualitative literature about guidance practices (e.g. Romito, 2016) and the ways in which teachers tend to reproduce social inequalities, albeit inadvertently or with a benign but patronizing intent.

4. Conclusions

The contribution has reported the strengths but also the limitations of the research design that we adopted to study tertiary effects. The section on the empirical application of our research design, focused on the micro-mechanism associated to school guidance to choose the upper secondary school track, provides interesting results and shows what we can learn on this specific topic by the use of different questionnaires addressed to the actors involved in such processes. Research cannot usually reconstruct an entire net-

[4] Items related to the proficiency index: proficiency, protection from failure, future studies; item related to preferences: student preferences, family preferences; items related to experience of older family members, geographical proximity, possibility of receiving family support. Total variance explained by the factors: 0.69. Average uniqueness of the items: 0.3.

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work of teachers/parents' relationship, given that only one or two sample classes are selected, which makes it almost impossible to see intra-school processes but only those occurring between schools.

The empirical test provides us with good news. The response rate by principals, teachers and parents does not seem to be influenced by variables such as the socio-economic background of households. In other terms, there has not been a problem of self-selection by schools and families in more affluent contexts compared to other less affluent ones. Furthermore, we found a high correlation between teachers and parents' response rates, which can be interpreted as a sign that the engagement of principals plays a pivotal role in obtaining the one of families and teachers.

At the same time, the strategy that we adopted to collect data has been only partially satisfactory. The response rate, especially for teachers and parents, is not sufficient if the goal is to investigate in details micro-mechanisms related to tertiary effects, especially if the research design requires that in the same school/class it is necessary to collect information from all the actors involved.

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6. A descriptive assessment of grading standards across Italian provinces

by Emanuele Fedeli

In the public debate in Italy, there is a narrative about certain southern provinces exhibiting more lenient grading standards (the gap between teachers' marks and standardized tests) towards students. In the south, teachers tend to give a kind of bonus compared to those in the north, and this geographical gradient in grading standards is empirically confirmed by previous scholarship. However, these studies have two main limitations. Firstly, they do not address theoretical and empirical issues in estimating grading standards due to data constraints. Secondly, they do not pinpoint the plausible roots behind different grading standards in the country. This study has two goals: firstly, to identify grading standards in Italian and Mathematics in the 8th grade, accounting for various issues, and secondly, to suggest the roots of these geographical differences. Using data from the INVALSI-SNV, we track cohorts of students enrolled in the 5th grade in the academic years 2011/2012, 2012/2013, 2013/2014 up to the 8th grade (800,000 students). The results show a geographical gradient both for Italian and Mathematics in the 8th grade, with southern provinces appearing more lenient. However, this scenario changes when addressing issues in grading estimation and drastically changes when considering the average ability (measured in the 5th grade) of incoming provincial cohorts. Hence, the geographical gradient exists but does not always align with the classic North-South comparison, and this gap is influenced by cohort ability composition for each province.

Nel dibattito pubblico in Italia, esiste una narrativa riguardante alcune province del sud che mostrano standard di valutazione più indulgenti (il divario tra i voti degli insegnanti e i test standardizzati) nei confronti degli studenti. Nel Sud, gli insegnanti tendono a dare una sorta di bonus rispetto a quelli del Nord, e questo gradiente geografico negli standard di valutazione è empiricamente confermato da precedenti studi. Tuttavia, questi studi

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presentano due principali limitazioni. In primo luogo, non affrontano alcune questioni teoriche ed empiriche nella stima degli standard di valutazione a causa delle limitazioni dei dati. In secondo luogo, non suggeriscono le radici plausibili dietro i diversi standard di valutazione nel Paese. Questo studio ha due obiettivi: in primo luogo, identificare gli standard di valutazione in Italiano e Matematica nella classe 8ª, tenendo conto di vari problemi, e in secondo luogo, spiegare queste differenze geografiche. Utilizzando i dati dell'INVALSI-SNV, seguiamo le coorti di studenti iscritti alla classe 5ª negli anni scolastici 2011/2012, 2012/2013, 2013/2014 fino alla classe 8ª (800.000 studenti). I risultati mostrano un gradiente geografico sia per Italiano sia per Matematica nella classe 8ª, con le province meridionali che appaiono più indulgenti. Tuttavia, questo scenario cambia quando si affrontano le problematiche nella stima delle valutazioni e cambia drasticamente quando si considera la competenza media (misurata nella classe 5ª) delle coorti provinciali in ingresso. Pertanto, il gradiente geografico esiste, ma non sempre si allinea con il classico confronto Nord-Sud, e questo divario è influenzato dalla composizione delle competenze delle coorti per ciascuna provincia.

1. Introduction

While ongoing discussions persist regarding the adoption of practices aimed at measuring students' competences, numerical assessment plays a central role in evaluating students in contemporary educational systems (Brookhart, 1993; Modica, Dardanoni and Pennisi, 2009). The debate over the assessment methods has always been at the forefront of pedagogical discourse and in recent years, even in fields such as the sociology and economics of education, given the paramount centrality that assessment methods can have on students' skills and educational choices (Brookhart, 1993; Sun and Cheng, 2014).

One of the most extensively researched topics is the effect of grading standards. By grading standards, we mean how generous or stringent teachers' marks are (Betts and Grogger, 2003) and the potential impact on students' skills and educational choices in terms of academic paths, aspirations, and university choices. In many educational systems, including the Italian one, teachers are free to establish their evaluation criteria regardless of common guidelines set at national or school level. Although there may be some guidelines in the assignment of teachers' marks, teachers will always have the room to exploit arbitrary variations in evaluation, giving rise to three main streams in the literature (OECD, 2012).

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The first stream measures grading standards simply by looking at the difference between the teachers' mark assigned to the student and the standardized test score obtained by the same student; a higher teachers' mark than the test would indicate leniency on the part of the teacher, while a lower teachers' mark would indicate greater severity (Betts and Grogger, 2003; Figlio and Lucas, 2004). The second stream seeks to understand the causes behind a specific grading standard, whether due to individual characteristics of the individuals or characteristics of the learning environment, or to proclivities and/or discriminatory elements (Malouff and Thorsteinsson, 2016; Westphal *et al.*, 2016). The third stream identifies the effect of being exposed to more severe or lenient grading standards on students' learning and has confirmed positive effects of exposure, including higher performance in subsequent years and more prestigious academic paths, regardless of the countries examined, as these patterns are confirmed in both European and non-European countries (Betts and Grogger, 2003; Figlio and Lucas, 2004; Lievore, Fedeli, and Triventi, 2024).

In this perspective, this study aligns with the first and part of the second stream and expands it by examining territorial differences in a European country such Italy. More recently, the focus has shifted from identifying grading differences between classes or schools to territorial differences, namely whether geographical areas exhibit greater severity or leniency towards students (Triventi and Argentin, 2015). Italy is a case in point, as for decades there has been debate over these territorial differences in terms of grading standards, despite the educational system being highly centralized in terms of educational policies. Anecdotal evidence and some contributions suggest a North-South gap in terms of teachers' marks; this study proposes some innovations useful for overcoming some problematic features in the construction of grading standards.

In fact, the study addresses three main challenges in estimating grading standards. The first one is how to describe the relationship between tests and teacher marks. Typically, it is described as if the teacher mark explains the test, but this contradicts a principle of reality: it is the test, or rather individual competence, that can partly explain the final teacher mark (Cinelli, Forney and Pearl, 2022; Heckman, 1999; Pearl, 2009) when performance on a math test depends on students' endurance, longer tests do not necessarily provide a more accurate measure of students' competencies or a higher correlation between the ranking of classes (or schools). The second one arises from the fact that standardized tests, such as those administered by INVALSI or international assessments, are exposed to measurement error and also influenced by the same teachers leading to a bias (Cinelli *et al.*, 2022). Indeed, tests in

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the 8th grade can be influenced by exposure to the same teacher or to different teachers, and this is also reflected in the grades. Ideally, a researcher would observe an entry-level test administered in the first year of secondary school and then compare the marks assigned by teachers to the same test in order to establish grading standards. In contrast, standardized tests are often administered during the school year, and test performance can be influenced by the Pygmalion effect (Rosenthal and Jacobson, 1968).

The third one is that grading standards may reflect the composition of the incoming student cohort (Cinelli *et al.*, 2022; Lievore and Triventi, 2022; Jerrim and Vignoles, 2013; Westphal *et al.*, 2016). Indeed, teachers adjust their grading based on the incoming students' competency levels. While not all teachers may be sensitive to this, there is evidence suggesting that teachers are responsive to the socio-economic and racial composition of their students (Zanga and De Gioannis, 2023).

The research is structured into three main sections. The literature review section is subdivided into five subsections: the first re-examines key theoretical contributions pertaining to grading standards, the second addresses the north-south disparity, the third focuses on identifying grading standards, the fourth describes the evaluation setting in Italy, and the final subsection delves into methodological considerations. In the research design section, attention is given to the data adopted and the empirical estimand. The results section offers analysis of the principal findings, backed by, graphs, and regression tables. Lastly, the conclusion presents a summary of the findings alongside reflections for future research.

2. Literature review

2.1 The relevance of grading standards

Grading holds significant weight in education, impacting the lives of students across different academic levels and playing a pivotal aspect of their relationship with many actors such as teachers, parents, peers, and employers (Batruch *et al.*, 2023; Bowers, 2011; Gentrup *et al.*, 2020). Indeed, teachers' marks serve as tangible indicators for students and their families, offering insights into educational attainment that might otherwise be not clear visible. These marks wield considerable influence, shaping students' motivation, self-assurance, and dedication to their studies (Fleischmann *et al.*, 2021). Additionally, they play a pivotal role in guiding educational decisions made by students and parents alike (Batruch *et al.*, 2023). Beyond the confines of academia, final

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teachers' marks hold significance, acting as a benchmark for university admissions and career prospects. Employers often view them as a measure of an individual's skills and suitability for a given role (OECD, 2012).

However, it is crucial to recognize that teachers' grading practices are multifaceted, influenced not only by students' academic proficiency but also by factors such as effort, motivation, and behaviour and classroom characteristics. This setting may lead to strategic grading decisions (Aucejo *et al.*, 2022; Iacus and Porro, 2011). Furthermore, teachers' marks can inadvertently perpetuate social inequalities, triggering peer comparison patterns among the students (Fedeli and Triventi, 2023; Fleischmann *et al.*, 2021) and impacting on educational outcomes. Research, particularly focused on the U.S., underscores the significant impact of grading standards on students' subsequent learning and skill development (Figlio and Lucas, 2004). In this vein, grading serves as more than just a numerical assessment; it shapes educational trajectories and societal perceptions. From this perspective, it is crucial to understand if there are systematic differences at the geographical level, determining whether students in certain regions are subject to more lenient standards compared to others, and accurately estimating the grading standards accordingly.

2.2. The north-south grading divide

The issue of grading practices, particularly the North-South divide in upper secondary education, has garnered public attention. Research suggests that southern regions tend to have lower grading standards (Triventi and Argentin, 2015), with teachers being more generous in assigning teachers' marks, especially to high-performing students. There is considerable indirect heterogeneity in grading standards across Italy, even within provinces or schools in the same regions (Lievore, Fedeli, and Triventi, 2023).

Examining the previous literature reveals numerous findings indicating geographical variances in educators' assessments within the educational continuum, spanning from elementary to university levels, a phenomenon consistent across diverse branches of the social sciences. Many of these investigations exhibit a local focus or run randomized field experiments, yet they remain pivotal in informing the Italian educational landscape. Some docimological investigations posit that educators may appraise student examinations disparately (Bolletta, 2001). This underscores the nuanced approach educators employ, assigning varying degrees of importance to distinct evaluation metrics (Bonner and Chen, 2019; Brookhart, 1993; Grant,

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2007). This discernible discrepancy in evaluative judgments has surfaced in multiple contributions. Research conducted in Trentino in 1999, centered on state examinations concluding upper secondary education, elucidated that educators' grading criteria were comparatively lax during oral assessments for students teetering on the pass/fail threshold after written examinations (Argentin and Tamanini, 2001).

Others have scrutinized the relationship between final teachers' marks in upper secondary education and standardized test performance for admission into medical faculties at universities (Sestito and Tonello, 2011). Admission relies on a uniform, national distribution of the examination, based on general knowledge. A very low association between teachers' marks at the end of secondary school and these tests emerges, providing indirect evidence of divergent grading standards across educational establishments and geographical regions. In some schools of Milan, Iacus and Porro (2011) probed into educators' grading practices in lower secondary schools, revealing disparities among teachers in term of severity according to classroom composition. Some studies analyse the variances in grading standards pertaining to reading comprehension using data from PISA 2009 (Gay and Triventi, 2011). Their findings revealed a decrease in evaluation stringency from Northern and Central regions to Southern Italy and the Islands. Notably, in Southern regions, educators tend to award passing marks more generously compared to their counterparts in the North, and this pattern persists even after accounting for potential differences in students' individual characteristics and school types.

2.3. The identification of grading standards

One effective method for examining teachers' grading standards is to compare students' performance on standardized tests with teachers' evaluations in the same subjects (Betts and Grogger, 2003; Figlio and Lucas, 2004; Lievore and Triventi, 2022; Malouff and Thorsteinsson, 2016). While school-teachers' marks offer a convenient and frequently used measure, standardized tests are designed to assess students' competencies in a "objective" manner, making them a valuable reference point of students' academic skills.

Indeed, the literature on grading standards primarily revolves around comparing teachers' marks, which serve multiple purposes and dimensions, with test scores, a more straightforward and subject-specific measure of students' knowledge (Malouff and Thorsteinsson, 2016). Although this compar-

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ison presents challenges acknowledged by researchers in this field, it allows for an exploration of the inherent differences between teachers' marks and scores in interpreting results. Hence, we can consider the discrepancy between teachers' marks and scores as an indication of teachers' strictness or leniency with the assumption that the test serves as a proxy of cognitive and non-cognitive characteristics (Grant, 2007). This assumption is fundamental in the education literature.

2.4. Teacher's evaluation in the Italian education system

In Italian primary and secondary schools, the Ministry of Education provides guidelines for grading students on a scale from 1 to 10, with 6 being the minimum passing mark assigned by teachers. Students and families receive two report cards per academic year, typically in late January or early February and again in June, detailing the students' academic progress. If a student receives a teachers' mark below 6 in any subject by the end of the year, they must retake an exam in that subject before the new school year begins in September.

The report cards typically display average teachers' marks for each subject based on various exams conducted throughout the semester. The structure and frequency of these exams vary depending on the subject, school regulations, and individual teacher preferences, giving teachers significant autonomy in their grading practices. While the Ministry of Education provides some guidelines, adherence to these guidelines varies among schools and teachers.

After completing the 8th teachers' mark, Italian students choose their high school track. Although teacher teachers' marks and recommendations are not binding for track selection, students typically have a formal or informal advice and choose between vocational schools, technical schools, and lyceums. Lyceums, particularly traditional ones focusing on humanities or science, are generally viewed as prestigious and often lead to university enrolment. Technical and vocational schools are geared towards entering the job market.

Despite the formal stratification of Italian upper secondary education, university enrolment is open to all high school graduates, regardless of their academic performance or final teachers' marks. However, some universities may require admission tests for certain programs.

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2.5. Issues in the identification

The first issue is primarily theoretical and concerns the relationships between the variables at play. In the literature, grading standards are typically described using standardized tests and teachers' marks, implicitly assuming that the teachers' mark explains the test score. However, this is quite plainly incorrect (Pearl, 2009); the correct theoretical relationship is the opposite, meaning that the test score explains the teachers' mark. This is not a naive suggestion but rather a crucial one, because accurately estimating the equation helps address a major issue in measuring grading standards in Italy, namely measurement error and a form of Pygmalion effect (teacher-loop bias).

The second methodological problem is a combination of measurement error and teacher-loop bias caused by the *Pygmalion effect* (Rosenthal and Jacobson, 1968). Consider the case of a student who, on the day of the test, does not perform at their best for various reasons, such as having argued with their parents or experiencing personal issues in a love affair. In this case, the test does not accurately reflect the student's true abilities, resulting in measurement error. On top of this, we must add another factor: the student and the teacher interact, internalizing each other's expectations. This effect describes how the interaction between teacher and student is internalized by the student and shapes their academic growth trajectory. For instance, if the teacher's interaction is positive and their expectations are high, the student internalizes these signals and may create a self-fulfilling prophecy by studying more and striving for academic success. Conversely, if the expectations are negative, the student may enter a downward spiral, leading to academic underperformance (Gentrup *et al.*, 2020).

This theoretical pattern has an important methodological consequence because standardized tests, such as INVALSI tests, are historically administered after the start of the school year. For example, the 8th grade test can be influenced by exposure to the same teacher or different teachers in the preceding two years in terms of evaluation. The complexity of this issue can be depicted through a directed acyclic graph (Fig. 1), which shows the presence of a teacher-student bias, meaning that tests and teachers' marks influence each other over time in each grade. Ideally, researchers would observe an entry-level test in the first year of secondary school and then compare it with teachers' marks on the same test to establish grading standards.

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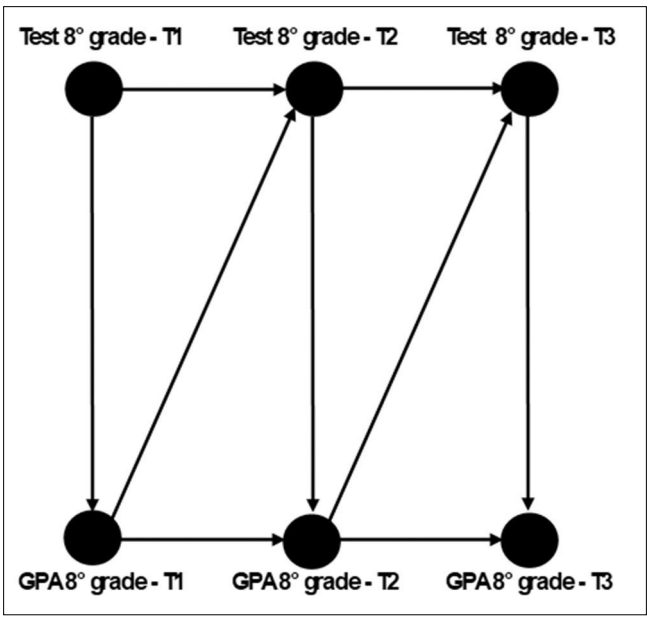

Fig. 1 – Directed acyclic graph of teacher-loop bias

However, this ideal experiment is challenging due to the different purposes and motivations between national/international assessments and the identification of grading standards. One possible solution is offered by a substantial body of literature that adjusts current test scores with tests measured at different times to address the so-called measurement error (Bradbury and Corak, 2015; Jerrim and Vignoles, 2013; Passaretta and Skopek, 2021), where performance may be affected simply due to the test-taker's state on a particular day, or a school agency effect, breaking the bias with a current agency and utilizing a test administered years earlier. This is relevant to our case because by using, for example, the standardized test administered at the end of elementary school, we leverage a different school agency and can thus mitigate this teacher-loop bias. Therefore, we utilize standardized tests administered in 5th grade as an instrumental variable to mitigate the teacher loop bias (Jerrim and Vignoles, 2013).

The third methodological problem is the typical dilemma when attempting to describe an association: which characteristics to control for. It is logical to control for certain socio-demographic features such as gender, ethnic background, and socio-economic status, which are fixed traits of individuals or at least the latter is fixed in the short term. This study emphasizes the importance of controlling for incoming students' competency

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levels during the transition from elementary to middle school. Teachers adjust their grading based on these levels. While not all teachers may be sensitive to this, there is evidence suggesting that teachers are responsive to the socio-economic and racial composition of their students (Westphal *et al.*, 2016). As previously discussed regarding school agency, it is advisable to identify a proxy for academic competencies assessed prior to exposure to 8th grade teachers, ideally during the elementary years. Therefore, we use standardized tests administered in fifth grade to measure the incoming cohort ability level in each province, precisely a few months before entering middle school.

The last side concern is that teachers have their own proclivities toward grading standards, independent of student composition (Aucejo *et al.*, 2022). This is a significant problem when examining the teacher effect within schools and classrooms and how teacher-student assignments are structured, whether randomly or not. The risk is that some schools may have more teachers with stringent proclivities regardless classroom composition or school policy. However, in our study, this risk is less pronounced since we are not looking at standards in each school but across territories. While it is plausible that teachers can accommodate the grading standard in some areas, we assume that teachers' proclivities are randomly distributed across provinces.

These issues, if we look at previous literature, have not been considered theoretically and especially due to limitations in data that did not allow for longitudinal connections to follow students over time in Italy. Today, it is possible to address these methodological challenges, and we can answer the research question of this study: whether geographical areas of the country show differences in grading standards and if these differences persist when controlling for an important characteristic of student cohorts, namely their incoming competencies. It is important to clarify that this study has a purely descriptive purpose and does not claim to establish causal identification of the phenomenon.

3. Research design

3.1. Model specification for grading standards

The research design of this study is centred on estimating grading standards across Italian provinces and comparing them. The choice of provinces was made because it represents the smallest legal geographic entity compared to regions, allowing for a more detailed exploration of geographic differences.

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The main variable of interest is teacher grading standards, which capture how teachers assess their students relative to student achievement as measured by INVALSI test scores. Standardized test scores aim to capture specific competencies acquired by students during their educational exposure (Heckman and Kautz, 2014) and are considered more objective than teachers' marks, primarily because they are usually evaluated without knowledge of the student's identity. Following Betts and Grogger (2003), a measure of teacher grading standards is constructed using two pieces of information: students' teachers' marks in Language and Mathematics, and students' test scores in Language and Mathematics. Teacher grading standards are estimated for each province; therefore, all students in the same provincial unit show the same grading standards.

Relying on two separate equations for Mathematics and Language, we estimate grading standards by regressing students' GPA in Mathematics and Language competencies (teachers' mark point averages) on their standardized test scores in the respective subjects. We also include a vector of provincial fixed effects, which represent our estimates of grading standards.

Given the debate on limitations of previous approach, we adopt three specific model specifications to address each point raised in the literature review section. In the primary specification, we reverse the estimation of grading standards compared to previous literature and estimate equation 1A. Subsequently, to account for the teacher loop bias, we estimate equation 1B, instrumenting the 8th teachers' mark test score with that of the 5th teachers' mark. Finally, in the last specification 1C, we introduce basic socio-demographic controls at provincial level such as the percentage of girls, immigrants, a socio-economic index, and the variable that plays a significant role, namely students' incoming competency.

$$GPA_{i,p,t0} = a_0 ProvFE_{p,t_0} + \beta_1 Test_{i,p,t_0} + \varepsilon_i \quad (1A)$$

$$GPA_{i,p,t0} = a_0 ProvFE_{p,t0} + \beta_1 Test_{i,p,t0} + \varepsilon_i \quad (1B)$$

$$\text{IV: } \beta_1 Test_{i,p,t_0} = a_0 ProvFE_{p,t_0} + \beta_1 Test_{i,p,t\text{-}3} + \varepsilon_i$$

$$GPA_{i,p,t_0} = a_0 ProvFE_{p,t_0} + \beta_1 Test_{i,p,t_0} + \beta_2 Test_{i,p,t_0} + \beta_3 Test_{i,p,t_{-3}} + \varepsilon_i \quad (1C)$$

$$\text{IV: } Test_{i,p,t_0} = a_0 ProvFE_{p,t_0} + \beta_1 Test_{i,p,t_{-3}} + \beta_2 Test_{i,p,t_0} + \beta_3 Test_{i,p,t_{-3}} + \varepsilon_i$$

Where $GPA_{i,p,t0}$ is the average score in Mathematics or Language in the 8th grade; $a_0 ProvFE_{p,t_0}$ is the fixed effect at provincial level measuring the grading standard; $\beta_1 Test_{i,p,t_0}$ is the standardized test in the 8th grade; $\beta_2 Test_{i,p,t_0}$ is a vector of individual socio-demographic characteristics and $\beta_3 Z_{i,p,t_{-3}}$ is

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a vector of provincial socio-demographic characteristics of the incoming cohorts collected at the 5th grade; $\beta_2 Test_{i,p,t_{-3}}$ is the standardized test collected in the 5th grade used as instrumental variable to tackle the teacher-loop bias; is the error term. We anticipate here that the joint or separate use of these socio-demographic controls does not alter the main message of the work, namely the role played by the incoming competence of the cohort. In terms of the methods employed, we run simple Ordinary Least Squares (OLS) for each previously discussed equation (1A, 1B, 1C). We estimate the equations with our analytical sample at the individual level and then store the estimates for each province. All models exhibit good goodness of fit and excellent significance in the association between GPA and standardized test. When estimating equations 1B and 1C, we adopt an instrumental variable approach (Pearl, 2009). Using standard criteria, we confirm that the instrumental variable, namely the 5th grade test, has a strong association with the 8th grade test, with the correlation hovering around 0.4 for each subject. Therefore, we have a good first stage ensuring that the instrumental variable is a valid instrument to mitigate the teacher loop bias.

The coefficients of province fixed effect represent the estimated grading standards in Language and Mathematics at province level. This implies that if there is variation across teachers, a province with a lower has lower/easier grading standards. If $a_1 > a_2$, a student in province 1 is exposed to lower grading standards relative to a student in province 2, the two students have an equal GPA in subject s, but the student in province 1 has a lower test score in subject s than the student in province 2. It is important to clarify to the reader that this is an estimation of provincial-level grading standards, which we can then plot at the provincial level.

To make the estimates identified with these equations more interpretable, we adopt two decisions. The first is to reverse the polarity of the variables so that a higher score along the grading standard distribution is associated with greater severity (simply reversing $a_1 > a_2$ in the previous example). The second is to normalize the scale between 0 and 100, where 100 indicates maximum severity and 0 indicates extreme leniency. Additionally, as an engagement rule for the graphical visualization of grading standards among provinces, we construct three grading standard bands: a low band ranging from 0 to 0.33, a medium band ranging from 0.33 to 0.66, and a high band ranging from 0.66 to 100. This is a reasoned choice that minimizes the strategic use of multiple bands that could exacerbate marginal provincial differences without substantive justification and create a visual fallacy.

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3.2. Data and variables

To investigate the disparities in grading standards across different regions of Italy, we utilize data from the INVALSI-SNV dataset. This dataset offers comprehensive information into the competencies and educational trajectories of students across various teachers' mark levels, covering the entire student population. We follow three consecutive cohorts (2011/2012, 2012/2013, 2013/2014), constructing a panel dataset comprising approximately 800,000 students enrolled from the 5th through the 8th teachers' mark. In detail, we use standardized tests and teacher marks separately in the eighth grade to estimate the grading standards in mathematics and language. Then, to address the previously discussed issues, we use standardized tests from fifth grade to tackle the teacher loop bias. We employ these tests along with other socio-demographic characteristics such as gender, ethnic background, and socio-economic background at the individual level, and the same variables at the provincial level, with the addition at the provincial level of the average ability score.

Tab. 1 – Descriptives statistics of dataset

	Mean	*SD*	*Min*	*Max*
Individual				
Gender	0.49			
Ethnic	0.12			
ESCS	0.0	1	-3	3
Test 8th grade – Language	0.0	1	-6	5
Test 8th grade – Mathematics	0.0	1	-5	4
Teacher Mark – Language	0.0	1	-5	2
Teacher Mark – Mathematics	0.0	1	-4	2
Test 5th grade – Language	0.0	1	-6	4
Test 5th grade – Mathematics	0.0	1	-5	4
Provincial				
Share of girls	0.50			
Share of non-natives	0.12			
ESCS	0.00	1.00	-1.94	2.25
Test 5th grade – Language	0.00	1.00	-2.62	1.51
Test 5th grade – Mathematics	0.00	1.00	-2.53	2.17
Focus				
Share of teacher with tertiary degree	0.3			
Gini Index	19.9	1.1	16.8	22.8
GDP	55,908	6,569	4,3102	76,831

Source: INVALSI-SNV and Urban Dataset Initiative

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Tab. 2 – Descriptives statistics of provincial grading standard indicators

Grading standard	*Eq.*	*Mean*	*Sd*	*Min*	*Max*
	1A	0.51	0.20	0	1
Language	1B	0.55	0.21	0	1
	1C	0.54	0.18	0	1
	1A	0.46	0.25	0	1
Mathematics	1B	0.45	0.24	0	1
	1C	0.58	0.18	0	1

Source: INVALSI-SNV and Urban Dataset Initiative

Leveraging the INVALSI dataset allows us to thoroughly scrutinize territorial discrepancies. The analysis encompasses a diverse range of individuals across provinces, with participant numbers varying from 1,100 (in Aosta province) to 92,869 (in Milan province). Main variables are derived from school administrative records, standardized tests conducted at specific teachers' mark levels, and tailored questionnaires administered to the entire student population. Our initial dataset (Table 1) is at the individual level, and we employ both individual and provincial characteristics to estimate grading standards. Once we obtain the estimates, we utilize a dataset at the provincial level (Table 2).

In the first part of the analysis, the outcome variable used to estimate grading standards pertains to the GPA collected in the 8th teachers' mark for both mathematics and language, considering oral and written examinations. We compute a simple arithmetic average between oral and written examinations. Hence, the primary dependent variable is the standardized test score collected in the 8th teachers' mark for both mathematics and languages (GPA in the equation formula). Higher values on this variable indicate better student performance on an absolute scale.

Regarding model specification, we incorporate control variables representing basic socio-demographic characteristics at the provincial level, such as gender, child migration background (natives vs. first and second-generation migrants), and dummy variables indicating the academic cohorts. Other variables are not included in the main analyses as they are not accounted for by the theoretical framework we rely on and could potentially bias our estimates, as discussed in the design section.

As a special focus of the analysis, we conduct an exploratory analysis using three macro-variables. The first is a measure of income inequality, constructed by aggregating the GINI index at the provincial level. The second is a measure of GDP. Both are recorded within the Urban Dataset Initiative. The

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third macro-variable is a measure of teacher quality proxied by the provincial share of teachers with a degree, as collected in the special survey on teachers conducted by INVALSI every academic year from 2014/2015 to 2016/2017. We use records from both elementary and lower secondary schools.

4. Results

In this section, the main findings of the research are discussed in two separate blocks. In the first part, we provide a geographical description of the main characteristics concerning the Italian territory, both in terms of competencies recorded by students at the provincial level. In the second block, we comment on the results of the analyses based on the research design previously described.

As discussed in the theoretical section and widely recognized in contemporary debate, Italy has been characterized by a profound North-South divide since its unification, and this gap has been a longstanding feature of public discourse but has gained greater emphasis following reforms that have affected the relationship between the central government and local administrations. Although the education system has remained largely centralized, territorial differences are present despite standardized policies such as the student enrolment system, the absence of financial aid, and the common evaluation system.

We start looking at average standardized tests in Italian and Mathematics (grade 5th) by province and we find a striking geographical gradient. These territorial differences are evident regardless of the performance bands used (Fig. 2). Indeed, there is a clear territorial divide along the peninsula when we look at performance in Italian, with a northern macro-area characterized by high territorial performance, as almost all provinces fall within the first band normalized from 66 to 100. Following this, there is a central area with intermediate performance between 33 and 66, and then a southern area characterized by lower performance. However, there is no clear Center-South pattern as some provinces show intermediate performance. This is important because it clearly outlines a competitive gap for the student body in southern Italy, which can already present such a performance gap in middle school. In contrast, when we look at Mathematics, the situation is even more nuanced with a poor adherence to the typical North-South divide. Indeed, it can be noted that only the North/Northeast falls within the high band, while the rest of the North follows a pattern very similar to that in central Italy. Southern Italy consistently shows lower levels, mostly present in the islands.

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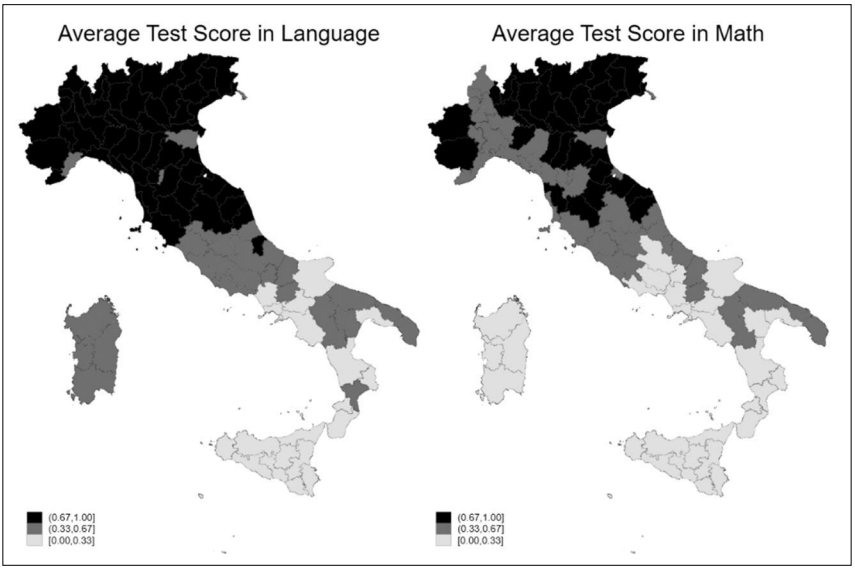

Fig. 2 – Average 5th grade test score by subject across provinces for three school years (2011/2012, 2012/2013, 2013/2014)

Source: INVALSI-SNV

Now, we discuss descriptively the main results from the estimation of grading standards in each Italian province, as discussed in the previous section on the research design. We have identified three estimations of grading. The first, the classic one, follows the Italian and international literature, exploiting the discrepancy between teachers' marks and test scores but with a simple innovation by reversing the equation to better align with the data generative process, namely that teachers' marks depend on the test and not vice versa. As evidenced by the maps provided for language, Italy is characterized by some provinces with high grading in the northeast and some in the Center. There is not a strong divide since many provinces in the North, Center, and South fall within the same band, except for some provinces in southern Italy that are in the last band. The results only partially confirm the previous contributions in the field (Triventi and Argentin, 2015), but it is important to remember that the research design is based on multiple cohorts of students and a different design, always in line with international research standards.

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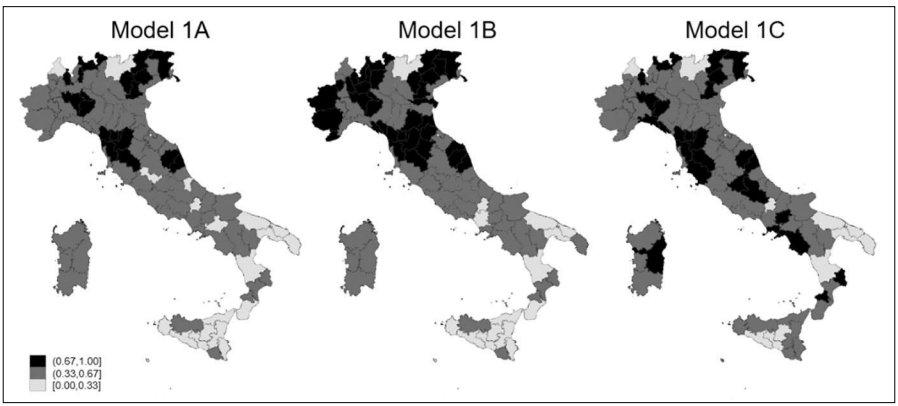

Fig. 3 – Grading standards in 8th grade language across provinces for three student cohorts starting in 2011/2012, 2012/2013, and 2013/2014

Source: INVALSI-SNV

The estimations start to change when we correct for the measurement error and teacher loop bias present in the INVALSI data as structured. It is evident that some areas in the central-north have different estimations, while the rest of Italy remains largely constant. It is important to understand that this correction with instrumental variable is the international standard to correct for measurement error or a teacher loop bias, and the fact that this correction affects the territorial level is relevant (Jerrim and Vignoles, 2013; Malouff and Thorsteinsson, 2016).

Even more relevant is what happens when we look at the third map, where not only do we use the correction for the teacher loop bias, but we also include a set of basic socio-demographic variables and the average ability upon entry to middle school, as observed in the fifth teachers' mark. There is a clear shift between the bands, especially for the provinces in southern Italy. We stress the fact that the change is essentially due to the inclusion of the average ability, and this is a message of great relevance. Indeed, when controlling for the competencies of incoming cohorts, grading standards in the south become "less" lenient (comparison 1C vs 1B), suggesting that teachers are more generous simply because they structurally deal with less competent students, leading them to provide more accommodating evaluations (Westphal *et al.*, 2016).

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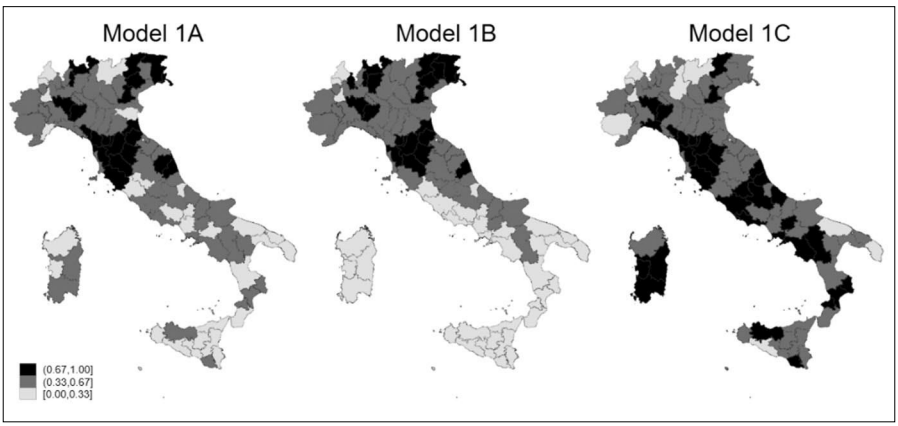

Fig. 4 – Grading standards in 8th grade Mathematics across provinces for three student cohorts starting 5th grade in 2011/2012, 2012/2013, and 2013/2014

Source: INVALSI-SNV

These results are also confirmed when we look at Mathematics, in fact, they are even more pronounced. Indeed, when we look at simple OLS estimates, the higher bands are mainly present in central and northern Italy, while other Italian provinces fall within the second or third band. Southern Italy is characterized by mostly average and low grading standards much more than in language. But when we begin to correct for the teacher loop bias and measurement error, there are some territorial changes more pronounced in the southern part, especially along the Tyrrhenian coast. However, it is when we introduce the set of control variables that the situation dramatically reverses. Southern Italy is assigned to medium and high grading standard bands, implying that even more than in language, the average level of ability explains the generous practices in southern Italy. The message is quite clear when looking at both main subjects of the education system. The idea that teachers in the south are more generous, as often portrayed, is not immediately supported when we start correcting the test for measurement error and the teacher loop bias. However, it is discredited when we compare provinces while keeping basic socio-demographic factors and the average level of ability constant. This indicates that the real point of discussion in the public debate should not be whether teachers in the south have pronounced generous proclivities when evaluating students, but rather that the stock of students is lower in terms of ability when enrolling in middle school.

In light of the results highlighted thus far, it becomes evident that incoming competencies play a significant role in estimating grading standards;

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however, it is reasonable to assume that other factors may be at play. For this reason, we conduct a provincial-level exploratory analysis wherein we regress the unadjusted grading standards (Model 1B) for incoming competencies against income inequality, the share of teachers with a bachelor's degree, and incoming competencies. In doing so, we aim to examine from an alternative perspective which characteristics are more or less associated with grading standards. In addition to incoming competencies, we incorporate three important indicators: one being the percentage of teachers with a bachelor's degree teaching at elementary and middle schools, another measuring the degree of economic inequality, and the last one a measure of provincial GDP. The first as a proxy for teacher quality, while the second and the third ones as proxy for the local context.

In this detailed analysis, we conduct a simple OLS regression (Table 3), including controls and interactions for geographic area (Northeast, Northwest, Center, South, and Islands). With regard to the associations between grading standards and both teacher education and income inequality (Table 2), we do not observe consistent patterns across geographic areas. However, the picture changes when examining the relationship between grading standards and incoming competencies: a strong and robust association emerges across all geographic areas, regardless of the subject considered. Incoming student competence appears to be the most important variable associated with grading standards, with higher levels of incoming competence linked to greater grading severity. When we look at geographic differences, we do not find consistent evidence of a clear geographic gradient. In the final model, which includes an interaction between average competence and geographic area, results suggest that the South tends to exhibit higher grading standards compared to the Northwest. However, the interaction term indicates a negative relationship between average competence and grading severity in southern provinces. It is important to note that the level of statistical significance is borderline, and alternative explanations – including omitted variable bias – cannot be ruled out. After all, both the AIC and BIC criteria suggest that the interaction does not improve the models. These analyses should be considered exploratory and suggest potential avenues for future research into contextual factors that may shape grading standards.

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Tab. 3 – Linear regression model. Standardised Beta coefficients (N = 102)

	Language			*Mathematics*		
Variables	*Model 1*	*Model 2*	*Model 3*	*Model 1*	*Model 2*	*Model 3*
Share of teachers with a degree	0.16	0.06	0.04	0.24*	0.08	0.12
	-0.13	0.14	0.14	0.12	0.13	0.12
GINI index	0.01	0.01	0.02	0.02	0.01	0.02
	0.01	0.01	0.01	0.01	0.01	0.01
GDP	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
Ability incoming cohort	0.57***	0.48***	0.88**	0.90***	0.89***	1.28***
	0.08	0.09	0.31	0.09	0.1	0.21
Reference: North-West						
North-East		-0.01	0.51		0.07	0.36
		0.04	0.32		0.04	0.23
Center		0.05	0.05		0.13**	0.16
		0.05	0.3		0.05	0.19
South-Island		-0.08	0.26		0.06	0.41*
		0.07	0.26		0.07	0.16
North-East * Ability incoming			-0.64			-0.42
			0.4			0.31
Center * Ability incoming			0.07			0.02
			0.39			0.28
South-Island * Ability incoming			-0.48			-0.78**
			0.33			0.25
Constant	-0.19	-0.07	-0.5	-0.35	-0.45	-0.78*
	0.31	0.32	0.39	0.29	0.29	0.30
R2	0.64	0.67	0.69	0.76	0.78	0.81
BIC	-106.13	-99.86	-93.92	-117.77	-113.76	-116.48
AIC	-119.11	-120.62	-122.47	-130.74	-134.52	-145.02
Obs.	102	102	102	102	102	102

Note: The dependent variable are grading standard estimate of 1B equation regressed on a vector of provincial characteristics; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: INVALSI-SNV and Urban Initiative Dataset

5. Conclusions

The idea, based on previous findings, that incoming competency levels could elucidate the leniency observed in grading standards is inherently cogent. Evidently, educators conscientiously consider students' initial competencies, thereby elucidating the grading leniency encountered (Lievore and

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Triventi, 2022; Westphal *et al.*, 2016). Certainly, from a regulatory standpoint, policymakers may consider introducing national guidelines to standardize student assessment across the country. However, this perspective can be misleading, as it risks undermining the pedagogical mission of teachers, who are expected to assess students by taking into account their starting points. It is therefore unsurprising that when incoming competence levels vary at the subnational level, clear geographic patterns in grading standards emerge. Moreover, the Italian school system is based on the fundamental principle of teacher autonomy, both in evaluating students and in choosing how to weigh different aspects of their academic development – particularly their individual progress. This study begins to shift the focus of the debate: rather than investing efforts and resources in enforcing uniform grading regulations, it may be more productive to focus on improving the foundational competencies of students as they enter lower secondary school. After all, assessment practices – by their very nature – are meant to reflect and support students' cognitive development (Bowers, 2011; Chetty, Friedman and Rockoff, 2014a, 2014b). Furthermore, this pattern is not dissimilar from another important finding observed in the Italian labor market, where in the face of company layoffs, courts are much more inclined to reinstate the worker in labor markets with high unemployment rates (Ichino, Polo and Rettore, 2003). This is because judges are aware that confirming the dismissal in a market with high unemployment would greatly diminish the likelihood of being hired. The same reasoning can be applied in our case; not only do teachers assess considering the level of incoming competency, but they may also be slightly more lenient due to the local context.

Future research can follow this path by improving both the estimation of grading standards and seeking to understand the drivers of local contexts or cohort characteristics that lead to these geographical disparities. Indeed, at present, this work partially fails to identify whether the differing levels of competency upon entry are due to idiosyncratic variations in cohorts or local context effects that diminish students' skills in the early years of schooling. Given that we leverage various cohorts, it is reasonable to suggest that there are local characteristics at play, such as low education expenditure (Pavese and Rubolino, 2024).

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7. Students' outcomes in four-year secondary courses: data from State exams and INVALSI tests

by Paolo Davoli, Francesco Orlando

In 2018, a national pilot program was launched to explore four-year upper secondary education tracks, departing from the traditional five-year duration of Italian upper secondary education. In June 2022, the initial cohort of students graduated, completing the same assessments as their 5-year counterparts in INVALSI standardized test and State exam. In June 2023, the second cohort of 4-year students graduated. Given the significant implications of such experimentation, a thorough analysis of outcome data is crucial for guiding future decisions.

This study investigates the outcomes of 4-year students in INVALSI tests and State exams in the Emilia Romagna region in 2022 and 2023, to evaluate whether the final skills of 4-year students are commensurate with those of their 5-year peers. An examination of students' proficiency levels upon entering high school is conducted to ascertain whether cultural backgrounds influence final results, alongside an exploration of the role of parental education.

Qualitative interviews were conducted with boards of examiners to determine whether the implementation of innovative and student-centered teaching methodologies had a discernible impact on students' skills.

The findings are presented, and some directions for further research are suggested. To the best of our knowledge, this study represents the first quantitative paper on outcomes resulting from the implementation of reduced school length experimentation in the Italian context.

Nel 2018 si è avviata una sperimentazione nazionale di percorsi quadriennali nella scuola secondaria di secondo grado. In giugno 2022 la prima coorte di studenti si è diplomata, sostenendo le medesime prove INVALSI ed esame di Stato dei loro compagni dei corsi quinquennali. In giugno 2023 si è diplomata anche la seconda coorte di studenti. Considerata la rilevanza

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dei temi implicati, esaminare i risultati partendo dai dati disponibili è utile per le decisioni future.

Lo studio esamina i risultati degli studenti dei corsi quadriennali e quinquennali agli esami di Stato e alle prove INVALSI in Emilia-Romagna nel 2022 e 2023, per verificare se le competenze raggiunte siano comparabili. Vengono esaminati i livelli di ingresso di quegli stessi studenti all'uscita del primo ciclo, per approfondire il possibile ruolo del background culturale e familiare. Sono anche state condotte interviste qualitative con i commissari d'esame per discutere se e come le metodologie didattiche innovative e centrate sullo studente, richieste nel progetto pilota, abbiano un effetto riconoscibile nei risultati degli studenti.

Il lavoro presenta i risultati emersi e prefigura possibili direzioni di approfondimento. Al meglio della nostra conoscenza, questo lavoro è la prima analisi quantitativa degli esiti degli studenti della sperimentazione quadriennale.

1. Introduction

In August 2017, the Ministry of Education, University, and Research (MIUR), now renamed the Ministry of Education and Merit (MIM), proposed a national experiment involving four-year upper secondary education tracks[1], in contrast to the regular five-year duration of Italian upper secondary education.

The call for the national experimental pilot targeted schools offering lyceum and technical tracks, thus excluding vocational ones. A total of 192 classes were authorized to participate in the pilot program, with 144 allocated to lyceum and 48 to technical schools. Among these, 127 classes were in state schools and 65 in private ones, and most of them started classes in the 2018/19 school year.

Participating schools were granted autonomy to make adjustments to the national curriculum based on ministerial guidelines. These guidelines emphasized the need for an innovative educational approach, including lab methodologies, effective Content and Language Integrated Learning (CLIL), elective classes, a restructured school agenda, and a different weekly lesson timetable. The goal was to ensure that students acquire, in four years, the skills expected in the ordinary five-year tracks, culminating in the same final State exam. The modified didactic organization, in some cases,

[1] Ministry Decree 567, June 3rd, 2017.

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suggested schools to provide additional resources such as co-teaching or laboratories.

In June 2022, the classes that started the pilot program in the 2018/2019 academic year concluded the experimentation by graduating the first cohort of students. These "4-year" students completed both the INVALSI standardized test of grade 13 (which, in their case, was "grade 12") and the State exam, using the same tests as their "5-year" counterparts who had started in 2017/2018.

In June 2023, the second cohort of 4-year students graduated (they started in 2019/2020), alongside the students who had begun an ordinary 5-year program in 2018/2019 (it's worth noting that the first 4-year student cohort started in this academic year, because they concluded one year before in June 2022).

This paper analyses the outcomes of 4-year students in INVALSI tests and State exams in Emilia Romagna in two years, summer 2022 and 2023, compared with their 5-years counterparts. To the best of our knowledge, we are the first to quantitatively report the outcomes of this reduced school length experimentation in the Italian case (INVALSI, 2022, 2023, p. 127).

2. Research questions and framework

In Italy, the four-year experimental pilot sparked controversies among various stakeholders within the educational community, including a segment of teachers and principals. While some embraced it as a positive innovation in the system, others took a stand against the pilot, criticizing the proposal itself. The available data enable us to address several research questions of significant relevance to the professional community and policy makers.

- Due to the requirements set by the Ministry of Education, the four-year programs were mandated to be equivalent to their corresponding five-year counterparts in terms of intended learning outcomes. Are the final skills of 4-year students, encompassing both disciplinary and transversal ones, comparable to those of their counterparts in traditional 5-year programs?
- Did social and cultural backgrounds, as well as family support, influence the students' decision to enrol in the 4-year courses, and did they impact the final individual results?
- Did the implementation of innovative teaching planning and methodologies, as well as the emphasis on active student learning and the use of technology mediated instruction have a discernible impact on students' skills?

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Across Europe and OECD countries, educational systems exhibit considerable variation, with some nations implementing a 12-year school trajectory, while others maintain a 13-year pathway (OECD, 2024). The discourse on how the length of schooling influences tertiary educational outcomes, labour market transitions, participation, personal autonomy, educational equity, and economic efficiency remains ongoing, with apparently few comparative studies.

In Germany, the shift from a 13-year to a 12-year gymnasium generated an extensive scholarly debate. The academic track schooling was shortened by one year, but instruction hours in the remaining years were increased to provide the same total instruction time – a strategy analogous to Italy's pilot program. Researchers investigated whether compressed curricula impacted student well-being, academic achievement and preparedness for higher education. Huebener and Marcus (2017) investigated whether it is feasible to compress instructional time into fewer school years without compromising educational standards and concluded that the reform adversely affected educational performance. Conversely, Büttner and Thomsen (2015) observed heterogeneous effects on school achievements, contingent upon the academic subjects considered (see also Thomsen, 2015, with a comparison between Ontario, Canada, and Germany shortening reformations). They further emphasized that the management of the educational process, particularly regarding academic curriculum planning and the resultant learning intensity, plays a crucial role. These findings may suggest that curricular adjustments and instructional methodologies, rather than the duration of schooling per se, may critically influence student outcomes.

In Italy, the recent national experimentation with four-year secondary education programs, which is the focus of this paper, confronts these very considerations. The focus is to verify whether curricular innovation – centred on student-focused teaching methods and integrated technology – can yield comparable or even enhanced educational outcomes within a condensed timeframe. Aligning Italy's experience with the broader international literature provides essential insights into how the structural organization of secondary education intersects with student achievement, equity of educational opportunity, and broader socio-economic goals.

3. Available data and research methodology

Sixteen schools in Emilia Romagna were initially allowed to participate in the experimentation starting in 2018, although ultimately only eleven actually took part in the pilot program. The eleven classes belong to different

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tracks, ten lyceum and one technical (Tables 1 and 2). Students data were analysed with statistical package R (R Core Team, 2023; Wickham, 2016).

Tab. 1 – Students examined in school year 2021/2022 – Relative frequencies (%)

	4-year %	*5-year %*	*4-year classes*	*5-year classes*
Scientific (traditional)	33.2	42.4	3	29
Scientific (applied sciences)	13.1	26.5	2	19
Scientific (sports)	10.5	6.4	1	4
Linguistic	33.7	17.5	4	12
Information Technology	9.5	7.2	1	6
(Tot)	(199)	(1,583)	11	70

Tab. 2 – Students examined in school year 2022/23 – Relative frequencies (%; classes are the same as in Table 1)

	4-year %	*5-year %*	*4-year classes*	*5-year classes*
Scientific (traditional)	33.7	40.1	3	24
Scientific (applied sciences)	18.3	30.5	2	18
Scientific (sports)	7.1	6.8	1	4
Linguistic	29.6	15.9	4	10
Information Technology	11.3	6.7	1	5
(Tot)	(169)	(1,333)	11	61

4. State exam cross-sectional analysis

Anonymized data from the State exams in June-July 2022 and 2023 were gathered for the eleven schools. Information about each student included scores in the last three years ("school credit"), in the first written test (Italian essay production), in the second written test (track-specific: English for linguistic tracks, Maths for all scientific tracks, Informatics for the information technology track), in the oral test (multidisciplinary discussion), and finally commission additional points (bonus) and honours.

The scores of 4-year students were compared to those of 5-year students in the same eleven schools attending the same programs (i.e., linguistic, scientific, and information technology). This approach aimed to improve the comparability of data by reducing variability in the educational context of schools, in the environmental context of students, and in the evaluation criteria employed by teachers.

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5. INVALSI data analysis

We conducted a variety of analyses on the results of the INVALSI tests.

Firstly, INVALSI data for grade 12 students (G12, 4-year) and grade 13 (G13, 5-year) in the year 2022 were combined with grade 8 data (from 2017 for 5-year and 2018 for 4-year programs) to collect information, about parents and context, for students completing high school in 2022. It should be noted that grade 8 WLE scores in 2017 and 2018 are not comparable, as they were collected using different and non-comparable methodologies, i.e., computer-based and pen-and-pencil (INVALSI, 2018; Botta and Lasorsa, 2017).

Then, in a similar way, INVALSI data for grade 12 students (4-year) and grade 13 ones (5-year) in the year 2023 were merged with grade 8 data (from 2018 for 5-year and 2019 for 4-year programs) to gather parents and context information for students completing high school in 2023.

Moreover, INVALSI data for grade 12 students in 2022 and grade 13 students in 2023 were collectively analysed. These students constituted the same age cohort that pursued distinct 4-year and 5-year tracks, graduating in 2022 and 2023, respectively. Their data were integrated with grade 8 data from 2018, allowing for a comparison of school entry conditions (e.g., parents' education, ESCS, grade 8 WLE) among the "peer students" who independently enrolled in 4-year and 5-year tracks in September 2018 (Figure 1).

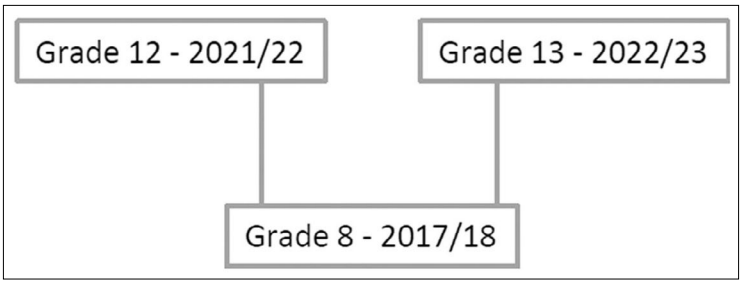

Fig. 1 – Integration of various INVALSI sources, then merged in Table 8 below

Finally, for comparison purposes, grade 10 data was also analysed, both for 2022 and 2023, connecting to grade 8 data. This data, however, will not be discussed in detail to avoid overburdening the paper.

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6. Other data and qualitative information

Additional data were collected from the eleven schools, including: the presence or absence of additional preliminary tests for students entering 4-year tracks; the mean results in the State exam at the end of middle school (corresponding to the grade 8 INVALSI test) for students entering both 4-year and 5-year tracks; the number of students leaving the 4-year classes to attend the 5-year tracks.

Qualitative interviews were also conducted with the boards of examiners during the oral tests of the State exams in June 2022 and 2023 at the eleven schools. The aim was to gather qualitative information about the 4-year tracks, including characteristics of the classes, teaching methodologies, students' involvement. Additionally, the interviews sought to capture the subjective perceptions of examiners regarding students' performances in the exam tests.

It must be emphasized that these eleven schools exhibit a high level of commitment from both teachers and principals regarding the vision and management of educational programs. Additionally, several of them are high-performing institutions, achieving often higher INVALSI results with respect to the territorial averages, for both 4-years and ordinary 5-year tracks.

7. Results and discussion

7.1. State exams scores

Tables 3-5 (see also Davoli and Olivetti, 2023) show the scores for 4- and 5-year students at the tests of State exams in June 2022 and June 2023 (first and second cohort of 4-year pilot program).

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Tab. 3[2] – Students' scores (base 20) in State exams, June 2022 and June 2023 – 1st written test, Italian

1st written test 2022 scores	*4-year %*	*5-year %*	*1st written test 2023 scores*	*4-year %*	*5-year %*
Score 1-8	1.5	0.6	Score 1-8	5.6	3.7
Score 9-10	0.5	1.5	Score 9-10	4.2	4.8
Score 11-12	7.5	11.3	Score 11-12	16.0	19.0
Score 13-14	16.1	16.8	Score 13-14	25.6	23.6
Score 15-16	29.2	26.0	Score 15-16	20.8	19.8
Score 17-18	18.1	17.3	Score 17-18	14.6	15.5
Score 19-20	27.1	26.5	Score 19-20	13.2	13.6
(Tot)	(199)	(1,583)	(Tot)	(144)	(1,077)

Tab. 4[3] – Students' scores (base 20) in State exams, June 2022 and June 2023 – 2nd written test, track-specific (Maths, English, Informatics)

2nd written test 2022 scores	*4-year %*	*5-year %*	*2nd written test 2023 scores*	*4-year %*	*5-year %*
Score 1-8	10.6	10.7	Score 1-8	18.8	13.4
Score 9-10	6.5	6.9	Score 9-10	3.5	6.9
Score 11-12	7.5	15.0	Score 11-12	16.7	17.2
Score 13-14	12.6	16.2	Score 13-14	15.3	16.8
Score 15-16	16.6	15.7	Score 15-16	13.9	16.2
Score 17-18	15.6	13.7	Score 17-18	12.5	13.1
Score 19-20	30.6	21.8	Score 19-20	19.3	16.4
(Tot)	(199)	(1,583)	(Tot)	(144)	(1,077)

[2] In the State exams of June 2022, the emergency regulations, necessitated by the pandemic situation, stipulated that the basis for evaluating the 1st written test had been modified to 15 points instead of 20 points, for the 2nd written test to 10 points instead of 20 points, for the oral test to 25 points instead of 20 points. For the sake of comparison, the scores in tables 3-5 were reported as if they were out of 20 points.

In the State exams of June 2023, students residing in flood-affected municipalities have been exempted from written examinations: their data were not reported in the Tables 3-5.

[3] See footnote 2 above.

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Tab. 5[4] – Students' scores (base 20) in State exams, June 2022 and June 2023 – Oral test, multidisciplinary

Oral test 2022 scores	*4-year %*	*5-year %*	*Oral test 2023 scores*	*4-year %*	*5-year %*
Score 1-8	5.0	4.2	Score 1-8	1.4	2.5
Score 9-10	3.0	6.1	Score 9-10	4.2	4.5
Score 11-12	6.5	8.9	Score 11-12	9.0	11.7
Score 13-14	13.6	16.4	Score 13-14	20.8	18.1
Score 15-16	13.1	13.3	Score 15-16	22.2	18.2
Score 17-18	25.1	21.9	Score 17-18	14.6	16.3
Score 19-20	33.7	29.2	Score 19-20	27.8	28.7
(Tot)	(199)	(1,583)	(Tot)	(144)	(1,077)

Focusing on year 2022, in the first Italian test (Table 3), the score distribution shows fewer 4-year students in the lower range 1-12 points (10% vs 13%) and similar scores in the higher range 17-20 points (46% vs 44%). In the second track-specific test (Table 4), the score distribution shows fewer 4-year students in the lower range 1-12 points (24% vs 32%) and more 4-year students in the higher range 17-20 points (46% vs 35%). In the oral test (Table 5), the score distribution shows fewer 4-year students in the lower range 1-12 points (14% vs 19%) and more 4-year students in the higher range 17-20 points (59% vs 51%).

In 2023, 4-year students exhibited less favourable outcomes; however, they still demonstrated comparable performance when compared with their 5-year counterparts[5].

At the conclusion of the exam, the board of examiners has the authority to augment the total score of students who have achieved high results in the tests, by assigning an additional score ranging from 1 to 5 points (referred to as a "bonus"). These bonus points are typically awarded based on criteria established by the commission, often associated with notable student performance. Table 6 depicts strikingly similar distributions for 4- and 5-year students, observed in both 2022 and 2023.

Exclusively for the purpose of comparison, in Table 7 we present the scores of the 1st written test in 2022 and 2023, categorized by students' gender. It can be observed that in both years, female students outperform male students in the higher score ranges of 17-20. This specific trend is well-known

[4] See footnote 2 above.

[5] As we will show later, the second cohort of 4-year students, who took exams in June 2023, had lower entry levels upon entering the first class in September 2019.

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(e.g. see INVALSI, 2018; INVALSI, 2022; INVALSI, 2023) and emphasizes that other factors (such as gender dynamics) have a greater influence on students' outcomes, rather than the difference between 4-year and 5-year tracks.

Tab. 6[6] – Students' "bonus" (additional score 1 to 5 points assigned by boards of examiners) in State exams, June 2022 and June 2023

"Bonus" 2022 points	*4-year %*	*5-year %*	*"Bonus" 2023 points*	*4-year %*	*5-year %*
0 Point	59.3	60.4	0 Point	79.8	74.4
1 Points	10.0	9.3	1 Points	0.7	3.0
2 Points	13.1	10.8	2 Points	3.5	6.1
3 Points	11,1	8.5	3 Points	9.7	6.6
4 Points	3.5	6.4	4 Points	4.2	5.3
5 Points	3.0	4.6	5 Points	2.1	4.6
(Tot)	(199)	(1,583)	(Tot)	(144)	(1,077)
(N. bonus)	(81)	(627)	(n. bonus)	(29)	(276)

Tab. 7[7] – Students' scores (base 20) in State exams, June 2022 and June 2023 – 1st written test, Italian

1st written test 2022 scores	*Females %*	*Males %*	*1st written test 2023 scores*	*Females %*	*Males %*
Score 1-8	0.8	0.7	Score 1-8	3.1	4.8
Score 9-10	1.3	1.5	Score 9-10	4.7	4.8
Score 11-12	9.1	12.7	Score 11-12	16.1	21.3
Score 13-14	14.4	19.0	Score 13-14	23.9	23.7
Score 15-16	24.8	28.0	Score 15-16	19.2	20.6
Score 17-18	18.3	16.4	Score 17-18	17.9	12.8
Score 19-20	31.3	21.7	Score 19-20	15.2	12.0

Conclusively, in 2022 4-year students achieved same or better results compared to their 5-year peers and over-perform in track-specific skills. Moreover, they show better soft-skills (problem-solving, autonomy, proactivity, multi-disciplinary connection abilities) which are typically evaluated during the multidisciplinary oral test (see last section below for teachers' opinions on this topic). In 2023 4-year students achieved lower results, anyhow comparable to the ones of their 5-year peers. Gender dynamics have a greater influence on students' outcomes.

[6] See footnote 2 above.
[7] See footnote 2 above.

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7.2. INVALSI tests scores

Figure 2 displays the results of the INVALSI tests in 2022 for Italian, Mathematics, and English Reading[8], presented as distributions across different proficiency levels (ranging from 1 to 5 for Italian and Mathematics[9], and B1 and B2 for English). The results are comparable between Grade 12 (G12) and Grade 13 (G13): slightly better in Italian for G12, slightly worse in Mathematics (though with more students at the top level), and slightly better in English.

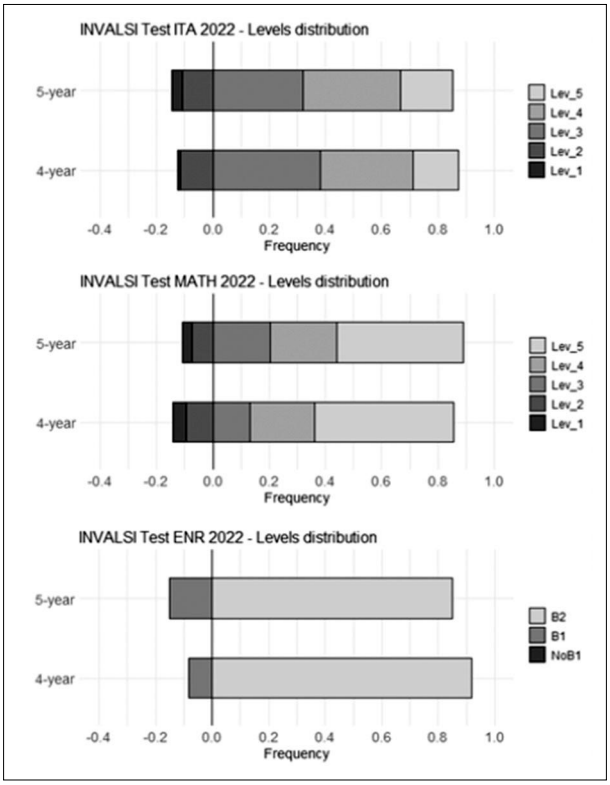

Fig. 2 – Students distribution for proficiency levels in INVALSI tests 2022 for Italian, Mathematics, English Reading

[8] For the sake of brevity, we will not report data on English Listening.

[9] Levels 1 and 2 indicate a result below the expected targets; level 3 represents an outcome aligned with the learning targets outlined by the National Guidelines; levels 4 and 5 represent the achievement of the highest learning outcomes. (Desimoni, 2018; INVALSI, 2022)

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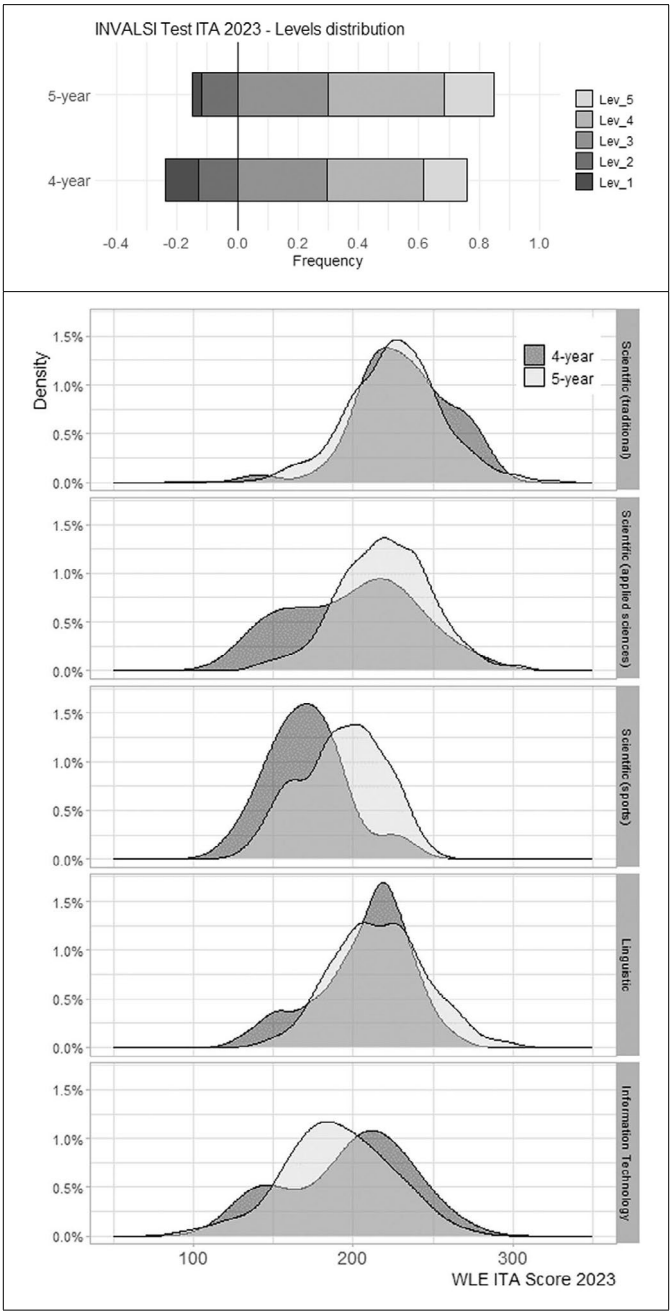

Fig. 3 – Students distribution in INVALSI Italian tests 2023: proficiency levels (upper left plot), detailed frequency distributions (right lower plot)

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Figure 3 presents data from 2023 (only Italian tests included for brevity): the upper plot suggests that G12 students achieved poorer results. However, a closer detail of WLE scores distributions for each single track listed in Table 2 above, reported in the lower plot, reveals that these poorer results are attributed to only 3 out of the 11 4-year tracks (second and third line of the plot), while the other 8 tracks have outcomes with comparable or higher scores than 5-year tracks. Comparable trends are observed for 2023 data in Maths and English. The limited size of the 4-year sample may account for these variations.

It must be emphasized that correlations between State exams and INVALSI tests do not appear to be significant in both 4-year and 5-year tracks. Exam scores do not follow a normal distribution, which limits the possibility of statistical comparison with INVALSI tests.

When examining WLE scores, similar findings emerge. For example, Figure 4 presents boxplots illustrating the class average of WLE scores for the traditional scientific track classes in both 2022 and 2023, with G13 classes depicted in light grey and G12 classes in dark grey. Solid lines represent the standard deviation. In both years, significant differences between G12 and G13 classes do not appear.

Differences in outcomes due to gender, ESCS status, parent education in INVALSI tests have been largely examined (INVALSI, 2018, 2022, 2023; Orlando and Davoli, 2021). Let's examine how overall WLE scores are influenced by a variety of factors. Figure 5 displays mean WLE scores for Italian in 2022 on the left column for all the students of the sample, along with their related 95% confidence intervals. The right column presents the same data for the 2023 tests. The first row illustrates differences between 4- and 5-year students, the second row illustrates differences between male and female students, the third row illustrates differences between students with a degree education level (at least one parent) and students with parents without a degree.

It can be said that differences in outcomes between 4- and 5-year students, if they exist within confidence intervals[10], are significantly lower than those generated by other factors such as gender dynamics or parents' education levels. It can also be said that both 2022 and 2023 INVALSI tests align with the results of the State exams discussed earlier, and show that 4- and 5-year students achieve comparable results.

[10] It should be noted that confidence intervals for 4-year students are much greater due to the smaller sample size.

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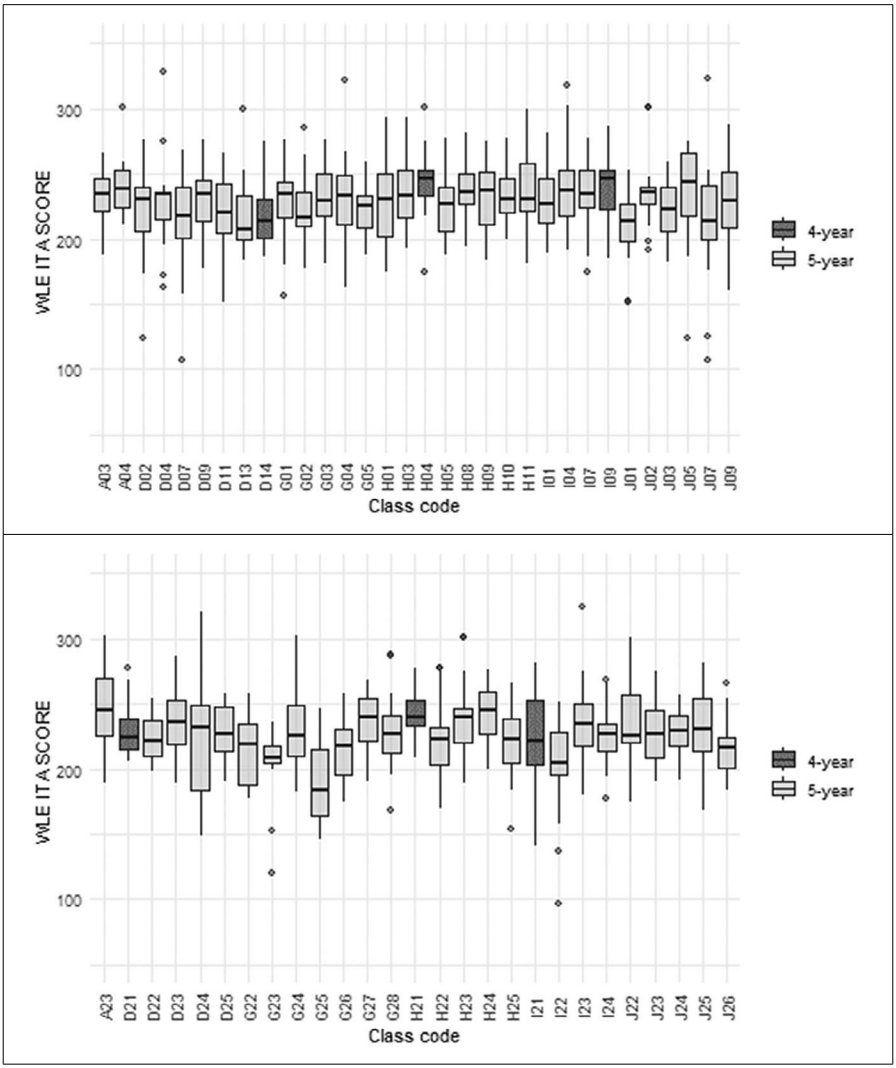

Fig. 4 – Boxplot of class average WLE scores for traditional scientific tracks in 2022 (upper) and 2023 (lower). In horizontal axis the names of the classes are set anonymous with code

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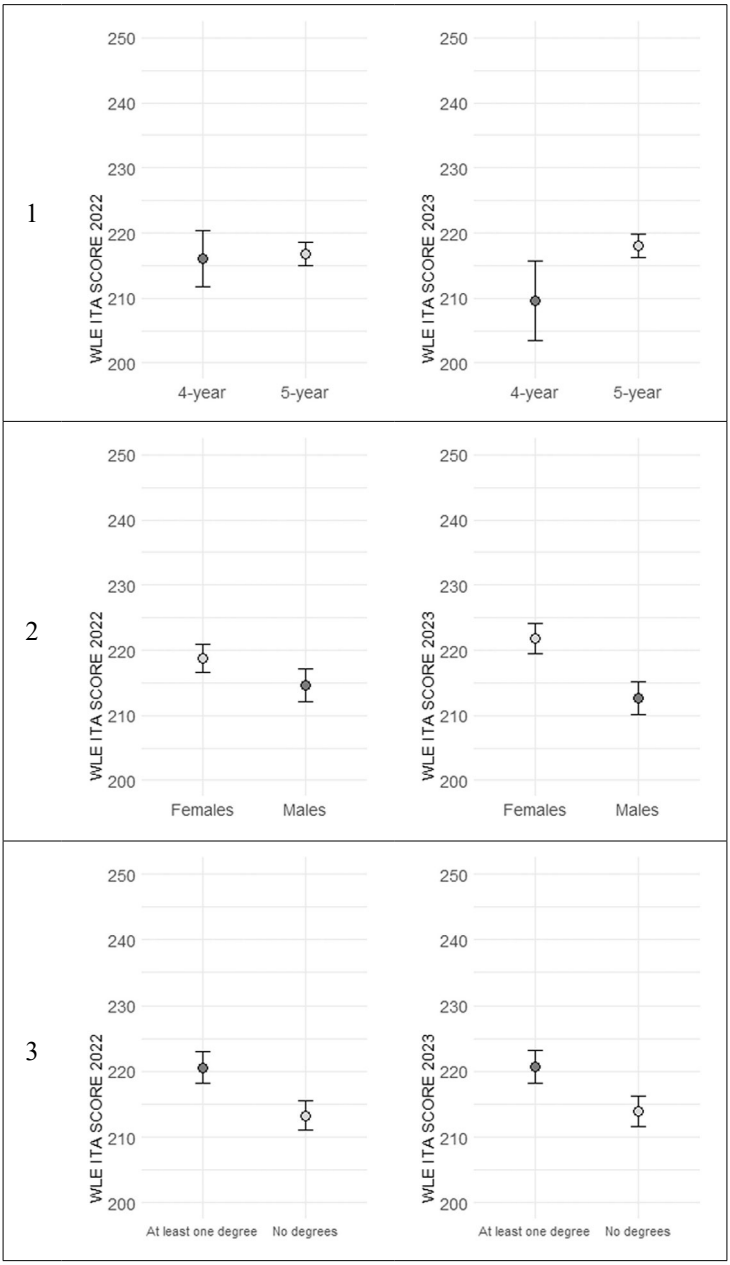

Fig. 5 – Mean WLE scores in Italian INVALSI test for all the students of the sample (left 2022, right 2023), with related 95% confidence intervals; row 1 4- and 5-year students, row 2 male and female, row 3 parents' education

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7.3. Students' background

One major question is whether there is a selection or self-selection process of students accessing 4-year tracks instead of 5-year ones. This issue arises from the fact that these courses condense the topics and nearly the total amount of hours covered in a five-year program into four years, with rearranged weekly timetable and year agenda throughout the year set by every school. Consequently, these pilot programs require students to shoulder a greater workload, demonstrate higher motivation, attend more hours of weekly classes, and sometimes even attend classes for more weeks. Four-year courses, some say, require specific personal skills and do not fit to students with common skills. Therefore, investigating students' backgrounds in such courses is a pertinent topic.

We investigated the school entry proficiency among the "peer students" who enrolled in September 2018, some in 4-year (graduating in 2022) and some in 5-year tracks (graduating in 2023). Their data in INVALSI tests 2022 and 2023 with grade 8 data from 2018 was integrated (see Figure 1 above)[11]. Then, we asked the eleven schools to collect the average scores in State exam at the middle school (grade 8) of students accessing the first classes in both 4-year and 5-year tracks.

Table 8 examines the first cohort of students who entered the first class in September 2018 and completed the 4-year courses in June 2022. The first column lists each one of the eleven schools using alphabetical letters to avoid school identification. The second column indicates whether the school implemented a selection process in September 2018 for students entering the first class of the 4-year track. The remaining columns display differences between students enrolling in the 4-year track and those enrolling in the common 5-year track at the same school in September 2018 (a positive difference indicates a higher average entry level for 4-year students). The third column shows the mean difference in final scores of the grade 8 State examination at the end of the preceding middle school class in June 2018 (out of 10 maximum points). The fourth, fifth, and sixth columns display the difference in WLE scores grade 8 tests in Italian, Mathematics, and English Reading in spring 2018 (out of around 230 points).

[11] See methodology section above for details.

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Tab. 8 – Data from the first cohort of students who enrolled the 4-year courses in September 2018 (see explanation in the paper). In columns 3-6 a positive value indicates a higher average entry level for 4-year students with respect to their 5-year counterparts

School	*Selection*	*Diff. in exam middle school*	*Diff in WLE ITA grade 8*	*Diff in WLE MAT grade 8*	*Diff in WLE ENG R grade8*
A	NO	0.25	-3.66	11.2	15.8
B	NO	N/A*	N/A*	N/A*	N/A*
C	YES	0.50	10.0	22.5	11.4
D	YES	0.70	17.7	23.9	7.5
F	NO	-0.27	-15.3	-19.3	-9.1
G	NO	0.35	10.2	-5.7	-2.4
H	NO	0.22	13.5	16.6	12.7
I	NO	0.00	23.8	9.9	22.0
J	NO	0.34	-6.8	-9.7	-0.6
K	NO	-0.31	-4.3	8.2	6.1
L	NO	0.53	0.9	-2.9	14.2
	Average	0.23	4.61	5.49	7.75

* Not available, since there was no corresponding 5-year track.

Similarly, Table 9 examines the second cohort of students who entered their first class in September 2019 and completed the 4-year courses in June 2023, comparing scores in grade 8 State examination at the end of the preceding middle school class in June 2019 with students who enrolled 5-year tracks in September 2019[12].

In Table 8, the exam and INVALSI data for each class generally align, and indicate that the initial cohort of students who enrolled in the 4-year tracks in September 2018 (2022 graduates) demonstrated, in the majority of classes, a mean entry proficiency level superior to their 5-year counterparts (2023 graduates). Two out of eleven schools implemented an entry selection process for enrolling 4-year students based on school performances, as the number of requests exceeded available positions.

In Table 9, exam data emphasizes that in September 2019, the second cohort of students entering the 4-year tracks (2023 graduates) had mean entry proficiency levels similar to their 5-year counterparts (2024 graduates).

[12] The comparison of grade 8 WLE data for 4-year and 5-year tracks for this cohort of students is not feasible, as it would require 2024 INVALSI data for the 5-year students, which is not available at the time of writing this paper.

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Tab. 9 – Data from the first cohort of students who enrolled the 4-year courses in September 2019 (see explanation in the paper). In column 3 a positive value indicates a higher average entry level for 4-year students with respect to their 5-year counterparts

School	*Selection*	*Diff. in exam middle school*
A	NO	-0.1
B	NO	N/A*
C	NO	0.7
D	NO	-0.03
F	NO	0.3
G	NO	-1.2
H	NO	0.3
I	NO	0
J	NO	0.1
K	NO	-0.1
L	NO	0.6
	Average	0.05

* Not available, since there was no corresponding 5-year track.

Tab. 10 – Comparison of "leavers" (see text) between 4- and 5-year tracks

School	*Leavers 2018-22*	*Leavers 2019-23*
A	More 5-year	More 5-year
B	N/A*	N/A*
C	More 5-year	More 4-year
D	More 4-year	Same
F	Same	More 4-year
G	More 5-year	More 4-year
H	More 5-year	More 5-year

* Not available, since there was no corresponding 5-year track.

Another potential indicator of selection or self-selection processes, among students attending 4-year courses, is the number of students who leave the classes each year (typically to transfer to corresponding or different 5-year tracks). For the sake of synthesis, we will refer to these students as "leavers"[13]. The eleven schools were required to report, for each school year from 2018 to 2022, the number of "leavers" away from 4-year tracks

[13] Please note that this term does not refer in any way to the concept of ELET (*Early Leavers from Education and Training*). Here, "leavers" are students who generally remain within the school system, in other classes.

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and away from 5-year tracks. Table 10 provides a summary of this comparison for each school.

It can be observed that for the 2018 cohort there were fewer "leavers" in 4-year classes (2018 4-year first classes were more performing, see section above), while in 2019 the number of "leavers" was comparable between 4-year and 5-year classes (2019 4-year first classes were equally performing, see section above).

Conclusively, the data suggest that the first cohort of 4-year students (2018-2022) had a mean entry proficiency level superior to their 5-year counterparts who enrolled in the first classes in September 2018, while the second cohort of 4-year students (2019-2023) had a mean entry proficiency level comparable to their 5-year counterparts who enrolled in the first classes in September 2019. The number of students who leave the classes each year to transfer to different tracks is similar for 4- and 5-year tracks.

7.4. Parents' education

It is widely recognized that parents' education level strongly influences student outcomes. For example, Orlando and Davoli (2021) evidenced that having at least one parent with a degree significantly increases students' scores on the Rasch scale in INVALSI tests.

Table 11[14] reports the scores in State exam and INVALSI tests grouped by parents' education (at least one parent with degree level versus no parents with degree level), compared for 4-year and 5-year students graduated in 2022. Table 12 reports similar data for year 2023 but limiting to INVALSI tests[15].

[14] See footnote 5 above for explanation of the bases of 1st, 2nd and oral test in 2022 State exam (respectively 15, 10 and 25 points). Here, it was not necessary to report them as if they were out of 20 points, as done instead in Table 3-5.

[15] Due to a lack of information, it was not possible to perform such analysis for State exam scores in 2023 data.

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Tab. 11 – Scores of students graduated in 2022, grouped by parents' education (at least one parent with degree vs no one degree)

4-year students	*Degree*	*No-degree*	*Difference*	*5-year students*	*Degree*	*No-degree*	*Difference*
% parents	52.1%	47.9%		% parents	47.2%	52.8%	
Exam 1st test	12.5	11.9	4.8%	Exam 1st test	12.2	11.8	3.3%
Exam 2nd test	8.2	7.2	12.2%	Exam 2nd test	7.6	7.1	6.6%
Exam oral	21.1	20.2	4.3%	Exam oral	20.4	19.7	3.4%
Exam final	87.2	83.4	4.4%	Exam final	84.5	81.8	3.2%
WLE Ita	224.3	207.1	7.7%	WLE Ita	220.0	214.0	2.7%
WLE Mat	241.9	221.7	8.4%	WLE Mat	234.8	224.6	4.3%
WLE Eng R	243.8	232.6	4.6%	WLE Eng R	231.1	222.9	3.5%

Tab. 12 – Scores of students graduated in 2023, grouped by parents' education (at least one parent with degree vs no-degree)

4-year students	*Degree*	*No-degree*	*Difference*	*5-year students*	*Degree*	*No-degree*	*Difference*
% parents	53.0	47.0		% parents	47.2	52.8	
WLE Ita	217.7	200.5	7.9%	WLE Ita	221.0	215.3	2.6%
WLE Mat	232.8	212.2	8.8%	WLE Mat	238.1	228.2	4.2%
WLE Eng R	239.8	230.5	3.9%	WLE Eng R	239.6	232.4	3.0%

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Tables 11 and 12 for 2022 and 2023 respectively highlight various points.

Firstly, they indicate that, both in 2022 and 2023, 4-year students had parents with higher education levels (with at least one degree, approximately 5% and 6% more than their 5-year counterparts). This finding is not surprising, given the nature of the four-year program as a pilot experiment. It's not surprising that families with higher parental education levels may have been more informed about international and national discussions on the duration of schooling systems (12 years instead of 13) and the potential benefits of earlier access to tertiary studies or employment. As a result, they may have been more inclined to support and participate in such projects.

Secondly, Tables 11 and 12 confirm, as expected, that students with higher parental education tend to achieve higher scores compared to students whose parents do not hold degrees. This is evident in both 4-year and 5-year tracks (as shown on the left and right sides of the Tables, respectively). However, the data suggests that this difference is more pronounced for 4-year tracks. While the limited sample size prevents definitive conclusions, further analysis of this phenomenon is warranted. This raises the question about how schools are effective in promoting intergenerational social mobility and mitigating social disparities. If shortening the duration of studies by one year could potentially limit schools' effectiveness in reducing social differences, it underscores the need for specific attention and countermeasures in 4-year tracks.

7.5. Qualitative interviews to the State exam boards of examiners

During the 2022 and 2023 exams, the boards of examiners for the 4-year classes were interviewed (see Davoli and Olivetti, 2023, for 2022 interviews) to ascertain whether the particular didactic approach mandated by the Ministry for 4-year tracks had any impact on students' performance in the exam, encompassing both disciplinary and transversal skills (for a framework on so-called soft or transversal skills, see, for instance, OECD, 2015; Panebianco, 2019).

Indeed, as reported by numerous teachers engaged in the 4-year experiment, the instructional approach is distinguished by a notable emphasis on methodologies such as interdisciplinary teaching, collaborative learning and student team work, flipped classroom models, formative assessments, tutoring, with technology playing a pivotal role ("compressing in four years, diverse methodologies are needed to prevent it from becoming burdensome", in brackets, some examiners' opinions). Teachers assert that the structuring of the 4-year curriculum is revised in time-scheduling but remains equivalent to that of the corresponding 5-year programs («the prejudice that the 4-year

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program is reduced must be debunked»). Achieving this, necessitated a reconfiguration of scheduling throughout the academic years, a reorientation of content focus, and the implementation of diverse instructional designs and methodologies («it's necessary to set clear objectives, with highly interactive lessons»; «with the different organization of teaching and events, we managed to engage students»).

The examiners interviewed underscore that students in the 4-year program often exhibit notable development in cross-cutting skills («students have more awareness of the learning path»; a board external chair: «this class approaches the exam with a different style of motivation and commitment»), and attribute this to the distinct teaching methodology employed in these classes («we used methodologies centred on lab work in daily teaching, and they had a very effective impact on the development of the class's soft skills»; «transversal skills are obtained more here than in other classes»).

Examiners reported heightened abilities in making interdisciplinary connections («there's a greater ability to connect topics»; a board external chair: «during the oral test, they spoke with autonomy, while often in ordinary boards we have to help students make connections between subjects»); in engaging with contemporary events («students tell us that it's the way of working that makes the difference, the interdisciplinary method»); in collaborating in group settings («the 4-year students are much better at working in groups»; «they've done a lot of group work, which has forced them to be accountable to others and participate more»; «in the 5-year students, I see a more individualistic approach»); in problem-solving («they know how to give themselves tasks and find things»). They reported students have higher autonomy («they show more autonomy and personal pathways»), motivation («they were much more motivated, even regarding technologies»), proactivity («facing the second written test, all 4-year students attempted to answer all of the questions, while in the 5-year classes in our school several students gave it up when facing the more difficult ones»).

Across different examination panels, there is a repeated emphasis on a «less academically oriented preparation», characterized by a departure from sector-specific knowledge and a shift away from mere content memorization («students have freed themselves from the "schoolish sense"»).

Varied teaching methodologies help also with lower level students («A girl in first grade classes was struggling, but now she's among the best: "I didn't like studying", she told us, and she's an example of how non-frontal methodologies can help in learning»; «learning isn't just about read-study-repeat, but about skills and relationships between subjects and the present

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days»). This is crucial for organizing curriculum content within a condensed timeframe («it's a didactic revolution, I had to rethink my planning, organizing it around thematic nuclei»). The role of information technologies in teaching is here paramount for fostering dialogue and collaboration among peers and educators[16].

The workload for teachers is significant and requires great collegiality among them, necessitating specific motivation and commitment («I enjoyed working across subjects with colleagues»; a board external chair: «The way students' written papers are corrected by the internal examiners is different from the 5-year boards, because it's genuinely collegial»; «It is necessary to have a team of teachers who work together»).

8. Conclusions and future development

The study examined the performance of 4-year students in standard INVALSI tests and State exams in Emilia Romagna in 2022 and 2023, comparing them with their 5-year counterparts in the same eleven schools participating the corresponding ordinary tracks (totalling approximately 3,300 students). Launched nationally in 2018, the pilot program mandated schools to ensure that 4-year students acquired the disciplinary and cross-cutting skills expected in standard five-year tracks within four years, employing innovative, student-centred teaching planning and methodologies.

The data suggest that this objective appears to have been met.

The paper shows that INVALSI test and State exam data lead to similar findings. Both in 2022 and 2023, students in 4-year and 5-year programs achieved comparable results, with 4-year students even outperforming in track-specific and multidisciplinary skills in 2022, and achieving lower results in 2023 (anyhow comparable to 5-year students). Differences in outcomes between 4-year and 5-year students, if present, are notably smaller than those attributed to other factors such as gender dynamics or parental education levels.

The initial cohort of students enrolled in 4-year tracks in 2018 (graduating in 2022) entered the high school with a mean proficiency level superior to their 5-year counterparts upon completing the first cycle. Conversely, the second cohort of students entering 4-year tracks in September 2019 (gradu-

[16] During pandemic lockdown in spring 2020, 4-year classes were already prepared to technology mediated learning, and they have headed the technological transition for the other classes in their schools.

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ating in 2023) exhibited mean entry proficiency levels similar to their 5-year counterparts (who will be graduating in 2024).

The rate of students leaving 4-year courses due to academic difficulties or to transition to other tracks is comparable between 4-year and 5-year classes for both cohorts.

In both years, approximately 5% and 6% of 4-year students had parents with higher education levels (at least one degree). This finding aligns with the experimental nature of the four-year program. As expected, students with parents holding higher education levels tend to attain higher scores compared to those whose parents do not hold degrees, evident across both 4-year and 5-year tracks. However, the data seem to suggest that this difference is more pronounced within the 4-year cohorts. Should this trend be validated with larger samples, it emphasizes the necessity for targeted interventions and strategies within 4-year tracks.

In qualitative interviews, teachers assert that the 4-year revised curriculum remains equivalent to the corresponding 5-year one, and this necessitated a reorientation of content focus and the implementation of diverse instructional designs and methodologies. Teachers assert that the experimental tracks need to be based on active methodologies such as interdisciplinary approach, student teamwork, flipped classroom models, formative assessments, with technology playing a pivotal role, to prevent schooling from becoming burdensome. Accordingly, board of examiners interviewed noted that students in the 4-year program often displayed enhanced soft skills such as interdisciplinary connections, teamwork abilities, problem-solving, autonomy, and proactivity. These subjective observations align with findings from data on the oral multidisciplinary test in State exams. Teachers attribute the development of higher transversal skills to the implementation of diverse instructional designs and methodologies. It is also reported that, consequently, the design workload for teachers remains relevant, necessitating specific motivations and stability.

Future research directions may include expanding the dataset to a national level, also to mitigate potential artefacts stemming from the limited size of the regional 4-year student sample.

Furthermore, additional analysis could explore the impact of parental education on students' outcomes in 4-year tracks, potentially investigating the existence of a "4-year school effect" (Cardone *et al.*, 2019; Bendinelli and Martini, 2021) in relation to students' initial levels and backgrounds. This inquiry extends to how schools actually facilitate intergenerational social mobility and contribute to narrowing social disparities (Orlando and Davoli, 2021).

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Emmanuele Pavolini is Full Professor in Economic Sociology and Social Policy at the University of Macerata (Italy). As an economic sociologist he has focused his research interests in two fields: a) welfare state studies from

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a comparative perspective, with specific attention to the Italian and Southern European welfare states, inequalities in the access to welfare state provision; b) labour market research and economic development, with a focus on the changing roles of professionals, networks among enterprises, strategies for competitiveness, and the role of migrants in the labour market. He is a National Expert for Italy of the European Commission Expert Network ESPN (European Social Policy Network).

He is currently co-editor of the *Journal of European Social Policy*.

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La passione per le conoscenze

Ideally, schools should provide equal opportunities for all students. However, they are often unable to avoid perpetuating the inequalities found in wider society. Promoting inclusion means recognising the value of all differences and ensuring that every student has what they need to learn and grow, regardless of their starting point or background. This topic was discussed at the VIII Seminar, 'INVALSI data: a tool for teaching and scientific research' (Rome, 23–26 November 2023) and this volume comprises a selection of the contributions that were presented. The chapters address the issues of educational inequality and early school leaving in Italy and Europe, adopting a variety of perspectives and focusing particularly on the processes that enable them and the strategies that can be used to combat them.
As a statistical service, we hope that reading this volume will provide the tools for interpretation and operational ideas for improving the school system, offering theoretical reflections, empirical evidence and operational guidelines to promote a more equitable and inclusive system that can enhance the potential of all students.

Patrizia Falzetti, Technologist Director, is the Head of the INVALSI Area of the Evaluation Research, of the SISTAN Statistical Office and of the INVALSI Statistical Service which manages data acquisition, analysis and return about both national and international surveys on learning (OECD and IEA). She coordinates and manages the process about returning data and statistical analysis to every school and to the Ministry of Education and Merit.

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