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School track choice, low performing and job expectation: an analysis of the chain effect

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School track choice, low performing and job expectation: an analysis of the chain effect

Marialuisa Villani & Orazio Giancola

Abstract. This paper investigates the cumulative effects of social origin, school tracking, and academic performance on students' educational and occupational expectations in Italy. Drawing on PISA 2022 data, the analysis focuses on low-performing students and explores how school pathways and socio-economic background shape both aspirations and future trajectories. Using a three-step quantitative approach - including OLS and logistic regressions - we assess the impact of academic track, family background, gender, geographical area, and migrant status on student performance, tertiary education expectations, and job aspirations. Findings show that early school tracking strongly predicts academic achievement and future plans, often amplifying pre-existing inequalities. Students from vocational tracks and disadvantaged regions are significantly more likely to perform poorly and to expect lower-status occupations, while general track students express higher aspirations regardless of prior performance. The results highlight a "chain effect" of disadvantage, in which school choices, performance, and expectations are shaped by intersecting structural factors. We also explore gender paradoxes, with girls outperforming boys yet facing labour market inequalities. The study calls for targeted policies to support vulnerable groups - especially students in vocational tracks, migrants, and those in southern regions - and to foster inclusive school environments that expand the capacity to aspire.

Keywords: Low Performing, Tracking Effect, Educational Expectation, Occupational Expectations

Introduction

This paper examines how social background, school tracking and academic performance jointly shape students' educational and occupational expectations in Italy. It adopts a cumulative perspective, focusing on how these dimensions interact in structuring educational trajectories and future orientations.

The study builds on the concept of the chain effect (Giancola & Salmieri, 2022), which conceptualises educational inequalities as a cumulative process linking social origin, school trajectories and academic performance. While these dimensions have been widely studied, their combined effect on students' future-oriented outcomes - particularly educational and occupational expectations - remains less explored. This study provides an empirical application of the chain effect theory using PISA 2022 data, extending its analytical scope to students' expectations regarding tertiary education and future occupations. Particular attention is given to low-performing students, understood not as a marginal group but as systematically positioned within stratified educational structures that shape both opportunities and future expectations.

Underachievement is closely associated with ascriptive characteristics such as social origin, gender and migration background, and is linked to higher risks of early school leaving and long-term socio-economic disadvantage. These dimensions are strongly associated with a higher likelihood of early school leaving and the subsequent risk of becoming NEET (Not in Education, Employment, or Training). In the longer term, such conditions are linked to persistent unemployment, engagement in low-skilled or precarious employment, and enduring socio-economic marginalisation.

Analysing the conditions associated with student underperformance provides insight into structural constraints within educational systems, including unequal access to resources, differentiated school environments and socio-economic barriers that disproportionately affect disadvantaged groups (Wiederkehr et al., 2015). Addressing the needs of low-performing students is therefore not only relevant at the individual level, but also significant in relation to broader processes of social inclusion and inequality reduction (Heckman et al., 2006).

Given that this study is based on data from the 2022 OECD PISA survey, it also considers the impact of the COVID-19 pandemic on the Italian educational landscape, recognising the profound disruptions and structural shifts it has triggered (Lee, 2014; Giancola & Salmieri, 2024). Recent debates on learning loss provide an additional analytical lens for interpreting how pre-existing inequalities may have been exacerbated in this context.

By adopting a cumulative analytical perspective, the paper shows how social origin, school pathways and academic performance interact to shape students' expectations, linking educational stratification to imagined labour market trajectories.

The paper shows how social origin, school pathways and academic performance interact in shaping students' expectations. It is structured as follows: Section two presents the theoretical framework, Section three describes data and methods, Section four analyses performance inequalities, Section five examines educational and occupational expectations, and the final section discusses the main findings.

The Gordian knot of track choice, academic performances and educational expectations

In the sociology of education, track selection is widely recognised as a key turning point in students' educational and life trajectories (Hägglund & Leuze, 2021). A substantial body of research shows that early school tracking amplifies existing inequalities, reinforcing processes of social and educational stratification (Giancola & Salmieri, 2020; Barone et al., 2021).

Two key mechanisms - primary and secondary effects of social origin - link family background to both academic achievement and educational choices. Primary effects operate through performance differences, while secondary effects - also known as track effects (Giancola et al., 2025) - shape decision-making processes independently of achievement, often reflecting differences in resources, information and expectations (Jackson, 2013; Benadusi & Giancola, 2021).

Educational systems differ in how they structure access to and hierarchy among educational pathways. In more stratified systems, where tracks are clearly differentiated, educational choices tend to reflect social origin more strongly than prior achievement. This dynamic is particularly evident in Italy, where early tracking reinforces secondary effects and contributes to unequal educational trajectories. (Jackson & Jonsson, 2013, pp. 312–313).

Horizontal inequalities must also be taken into account. Even at the same level of education, students from different socio-economic backgrounds may not study the same subjects (Zimmermann & Seiler, 2019). These differences are crucial because horizontal differentiation contributes to vertical stratification: educational fields lead to markedly different labour market opportunities (Reimer & Pollak, 2005). In Italy, the predominance of secondary over primary effects is particularly pronounced (Contini & Scagni, 2011, 2013; Ress & Azzolini, 2014), contrasting with trends in several other European countries (Jackson & Jonsson, 2013).

Primary and secondary effects also shape students' educational expectations, which are key mediators of later occupational aspirations and transitions. These expectations are closely linked to the educational background of parents and to their cultural capital (Bukodi et al., 2021). However, social origin cannot be analysed in isolation. Its effects intersect with gender-based norms and expectations, migration background, and contextual variables such as regional disparities and access to educational opportunities. Even when performance is held constant, students from more advantaged families are significantly more likely to pursue ambitious educational goals (Jackson, 2013; Swart & Wolbers, 2024).

Tracking also mediates the relationship between social origin and occupational outcomes. Students from higher socio-economic backgrounds benefit disproportionately from academic tracks, which tend to yield better labour market returns. Barone et al. (2021) identify three main channels through which track choice influences occupational expectations. First, access to academic tracks and subsequent university graduation strengthens the link between social origin and entry into higher-status professions (Pisati, 2002; ISTAT, 2016; Ballarino & Panichella, 2016). Second, academic diplomas offer labour market advantages even for those who do not progress to tertiary education, thereby fostering intergenerational transmission of privilege. Finally, labour market returns to the same educational credentials may differ according to social class, with academic qualifications proving more valuable for children of upper-class families.

In addition, occupational aspirations are strongly shaped by the perceived social value of professions (Jaoul-Grammare, 2024). These perceptions reflect hierarchies of prestige constructed through the symbolic capital attributed by different social groups (De Luca, 2007), reinforcing the association between occupational status and broader social recognition.

In the Italian context, both horizontal and vertical stratification are exacerbated by the structure of the school system (Benadusi & Giancola, 2014). Geographical segregation and the rigid division of educational tracks further contribute to unequal opportunities. The key transition occurs at the end of lower secondary school, around the age of 14, when students are required to choose between three distinct pathways: general (Licei), technical (Istituti tecnici), and vocational (Istituti professionali). These programmes, though formally equal in length and progression opportunities, differ substantially in curricular content and long-term outcomes. Despite the apparent openness of the system, family background continues to heavily influence the track chosen, even overriding teacher recommendations (Bonizzoni et al., 2016).

A large body of research shows that students from higher socio-economic backgrounds are more likely to attend general academic tracks, while

those from disadvantaged backgrounds disproportionately enrol in technical or vocational schools (Contini & Scagni, 2011; Panichella & Triventi, 2014; Contini & Triventi, 2016). These decisions are only partially mediated by prior academic achievement, suggesting that educational preferences are strongly shaped by social origin (Giancola & Salmieri, 2022). Even before the pandemic, national assessments such as PISA and INVALSI had already documented how school track selection and academic outcomes reflected structural differences based on students' social origin, parental education, and regional disparities. Such structural patterns set the stage for further disruptions and challenges in the years that followed. Further studies based on PISA and INVALSI data confirm that differences in performance among Italian upper secondary students are more strongly related to track attended than to social background itself (Giancola & Fornari, 2011; Azzolini & Vergolini, 2014; Giambona & Porcu, 2015; Pensiero et al., 2019).

An understanding of how social origin shapes educational trajectories and aspirations can be further deepened through the lens of educational poverty.

We define educational poverty as the condition in which individuals lack the foundational skills required to navigate the complexity of social, cultural, and technological environments, and to continue learning, experimenting, developing, and fully realising their abilities, talents, and aspirations across the life course (Giancola & Salmieri, 2023).

We consider educational poverty in the dual and combined sense of:

- low levels of educational attainment;
- low, inadequate, and/or obsolete basic and transversal key competences necessary for the full emancipation of the individual (Allmendinger & Leibfried, 2003; Giancola & Salmieri, 2022).

Educational poverty provides a multidimensional framework for interpreting how socio-structural constraints limit students' ability to fully engage with educational opportunities and imagine meaningful life projects.

Inequalities in education unfold through a cumulative and interdependent process, often described as a chain effect of disadvantages (Giancola & Salmieri, 2022). This conceptualisation shows how social origin shapes educational pathways at multiple levels: first, by influencing early school choices (such as track selection); second, by determining exposure to school environments often segregated by socio-economic status; and third, by affecting both academic performance and aspirations for higher education.

The cumulative nature of these effects means that inequalities are not merely additive but mutually reinforcing across the school trajectory. Track choice, for instance, is both a consequence of prior disadvantage and a driver of further stratification. From this perspective, educational expectations are shaped by an entire ecology of influence, where family background, insti-

tutional arrangements, and peer environments converge to define students' imagined futures.

The transition to upper secondary school emerges as a critical juncture for the reproduction of social inequalities. Although the system is formally open, families' and students' choices have a decisive impact on future academic success and occupational prospects - particularly for those from lower social backgrounds. The way in which inequality is passed from one generation to the next continues to shape students' chances of social mobility and may contribute to deepening socio-economic exclusion over time.

While these mechanisms have long structured educational inequality in Italy, the unprecedented disruption caused by the COVID-19 pandemic has brought new urgency to understanding how school performance and expectations are shaped under conditions of systemic stress. These considerations provide the backdrop for the next section, which turns to the issue of learning loss and its implications for educational inequality.

Data and methods

For our analysis we used the most recent wave of the Program for International Student Assessment (PISA) 2022. The PISA program assesses 15-year-old students. The PISA2022 edition assessed almost 700,000 students from 81 OECD Member and partner economies. The most recent survey was conducted in 2022, and the dataset was released in December 2023. The 2022 PISA survey includes various questions related to students' educational and career expectations, allowing us to explore the relationship between social background, academic track, and career aspirations (OECD, 2023a). We conducted our analysis on students with low proficiency in reading and math in the PISA 2022 assessment. Students who perform poorly are at a higher risk of experiencing educational disadvantage and social marginalisation (Giancola & Salmieri, 2024).

Students aged 15 who were enrolled in lower secondary education, as well as those attending vocational education and training programmes that do not fall within the upper secondary education system, were excluded from the dataset. The final dataset comprises 485,016 students.

The variable related to the type of upper secondary school attended was recoded into a three-category variable, distinguishing between "*licei*" (academic-oriented track), "*istituto tecnico*" (technical track), and "*istituto professionale*" (vocational track). To facilitate the analysis of student performance, we calculated the mean of the plausible values for literacy and numeracy, based on the ten available values per domain. Using these average scores, we constructed a four-category variable to represent students' proficiency levels. The criteria used to define these categories are described in the fol-

lowing paragraph. All analyses were weighted using the student sampling weights provided in the PISA dataset to ensure the representativeness of the estimates (W_FSTUWT variable).

For the purpose of conducting regression analyses - both linear and logistic - a series of dummy variables¹ were created for key factors, including gender, geographical area of residence, grade repetition, type of school attended, and migrant background. These variables are essential for testing the initial research hypotheses.

To analyse students' educational expectations in the PISA 2022 survey, we used the variable EXPECEDU, which captures the highest level of education expected by the respondent. Based on this variable, we constructed a binary indicator (*index_high_expectation*) coded 1 for students whose responses corresponded to ISCED levels 5 to 8 - that is, from short-cycle tertiary education to doctoral studies. This *recoding* of original variables allows us to distinguish between students who aspire to pursue higher education and those who do not foresee continuing their studies beyond upper secondary school.

To examine the impact of socio-economic background on academic performance, educational choices, and students' aspirational capacity, the ESCS variable (an index of socio-economic background) was transformed from a continuous metric into a categorical variable with four levels: low, medium-low, medium-high, and high. The distribution of ESCS was divided into quartiles, thereby identifying four socio-economic categories ranging from the lowest to the highest quartile.

We structured the analysis into three steps. The initial step involved using Ordinary Least Squares regression (OLS) to analyse how social background, academic track, gender, immigrant status, and geographical location influence students' academic performance. We utilised dummy variables to compare low performers to students with higher proficiency levels. Additionally, we used logistic regression to understand the risks associated with being among the low performers.

In the second stage of the analysis, we conducted a binary logistic regression to study educational aspirations. Through the variable EXPECEDU, representing the highest level of education expected by the pupils, we created a dummy variable representing students who want to enrol in tertiary education. Using this new variable, we conducted a binary logistic regression to identify the factors that increase the probability of achieving a higher education diploma.

¹ In regression analysis, a dummy variable (also known as indicator variable or just dummy) is one that takes a binary value (0 or 1) to indicate the absence or presence of some categorical effect that may be expected to shift the outcome.

For the third part of the analysis, we explored the determinants of students' job expectations. We performed four OLS regression models using the BMSJ index, an OECD index that indicates a student's expected occupational status. This analysis helped us understand the link between low academic performance, social and educational background, and career expectations.

Performance inequalities and learning loss in Italy

Building on the PISA 2022 dataset described above, the following section explores performance inequalities and the learning loss phenomenon in the Italian context.

Over the past decade, empirical studies have documented a gradual decline in students' core competencies in literacy, numeracy, and science, reflecting a broader erosion of educational capital (Giancola & Salmieri, 2023). The COVID-19 pandemic acted as a catalyst, significantly accelerating pre-existing patterns of skill deterioration within educational systems.

Extensive research has shown that academic achievement is strongly influenced by school environment, family background, and peer networks (Sewell et al., 1969). As such, the social isolation caused by the pandemic has had a considerable impact on students' educational attainment. Before the pandemic, the concept of learning loss was largely associated with "summer learning loss" - the decline in academic skills typically observed during school holidays - which disproportionately affected students from lower socio-economic backgrounds with limited cultural capital (Zhang & Storey, 2022).

The implementation of lockdown measures and prolonged school closures exacerbated student isolation and prompted widespread concern among scholars about the potential consequences of pandemic-induced learning loss (Zhang & Storey, 2022; Volante et al., 2024). Analysis of recent PISA data on literacy, numeracy, and science reveals a growing association between learning loss and declining student performance, particularly among the most disadvantaged (Giancola & Salmieri, 2024).

Between 2018 and 2022, average mathematics scores across OECD countries declined by a substantial 15 points. In the same period, reading performance decreased by 10 points - twice the decline observed between 2015 and 2018 - while science results remained largely stable. Although the downward trend in reading and science has persisted over the past decade, mathematics scores had previously remained relatively consistent from 2003 to 2018.

In the Italian case, reading performance has been notably stable over time. In 2022, the national average in reading was 482 points, slightly above the 476 recorded in 2018 and close to the 487 reported in the initial PISA cycle in 2000.

Mathematics, by contrast, reveals a more concerning trend. Italy's average score dropped from 487 points in 2018 to 471 in 2022, effectively reversing earlier progress and bringing performance back to levels observed in 2003 (466) and 2006 (462). In 2022, 70% of Italian students attained at least Level 2 proficiency in mathematics - comparable to the OECD average of 69%. Students at this level are able to interpret and recognise how basic situations can be expressed mathematically, such as comparing distances or converting currencies (OECD, 2023a). However, only 7% of Italian students qualified as top performers, reaching Level 5 or 6 on the PISA mathematics test, compared to 9% across the OECD.

According to PISA data (OECD, 2023b), 61% of Italian students reported that their schools were closed for more than three months due to the COVID-19 pandemic, compared to an OECD average of 51%. Students in high-performing education systems generally experienced shorter closures and reported stronger feelings of school belonging. During remote learning, 31% of Italian students indicated that they struggled to understand school assignments at least once a week (OECD average: 34%), while only 23% reported having regular access to someone who could assist them with their schoolwork (OECD average: 24%).

Between 2018 and 2022, the performance gap between the highest-scoring students (top 10%) and the lowest-scoring students (bottom 10%) in Italy remained largely unchanged in both mathematics and reading. The decline in mathematics performance affected both groups to a similar degree, suggesting a generalised slide in achievement rather than a widening of the gap. Overall, the average performance of Italian students in mathematics continues to lag significantly behind both the OECD and EU averages, with a parallel downward shift observed among both high achievers and low performers.

According to Giancola and Salmieri (2024), data from the INVALSI national assessment system confirm that learning loss was more pronounced in mathematics than in reading across all school levels. This trend, consistent with findings across several European countries, has deepened educational inequalities linked to students' socio-economic and cultural backgrounds.

At the upper secondary level, the structure of the Italian education system further contributes to differentiation. As mentioned earlier, the three main school tracks - general (*licei*), technical (*istituti tecnici*), and vocational (*istituti professionali*) - attract student populations with markedly different socio-economic profiles. Students enrolled in technical and vocational pathways experienced more severe learning losses compared to their peers in general education tracks, which are traditionally designed to prepare students for access to higher education (Giancola, Salmieri, 2022).

The evidence presented above outlines the broader context in which Italian students form their educational aspirations and career expectations.

Within this framework, our focus turns to underachieving students. The analysis begins with data from the PISA mathematics and reading proficiency scales, which serve as the basis for constructing a three-level typology of low performers.

Following the technical documentation provided by the OECD, it is important to note that PISA scores - derived from students' responses to test items - are scaled to approximate a normal distribution, with a mean of 500 and a standard deviation of 100. Statistically, a one-point difference on the PISA scale corresponds to an effect size of 0.01 (Cohen's *d*), while a 10-point difference corresponds to an effect size of 0.10 (OECD, 2019, p. 43).

In the Italian case, the average score in mathematics is 471.3, with a standard deviation of 85.27. In reading, the average is 481.6, with a standard deviation of 86.39 (Table 1). These benchmarks form the reference for identifying and classifying low-performing students in our analysis.

According to the OECD (2023a), low performers in PISA are defined as students who demonstrate proficiency at or below Level 1. These students are typically capable of answering questions that provide explicit instructions and rely on a single source of information or simple, direct connections. However, they tend to struggle with more complex reasoning tasks and the integration of multiple pieces of information. In PISA 2022, the threshold for low performance was set at a score below 408 in reading literacy and below 420 in mathematics.

Table 1. Average scores in mathematics and reading (2022 – Only upper secondary schools)

Scores	N (weighted)	Minimum	Maximum	Mean	St. Deviation
average pvalue math	496.263	187,35	778,82	471,26	85,28
average pvalue reading	496.263	192,39	745,76	481,60	86,40

Source: Authors' elaboration of OECD PISA 2022 data.

In our analysis, we constructed two binary variables to identify students who performed below the proficiency threshold in each domain - literacy and numeracy. These variables were then combined to generate a single composite variable capturing overall low performance.

Based on this composite indicator, students were classified into four groups according to their performance in literacy and numeracy, as illustrated in Table 2:

- Top-left quadrant: Students scoring above the low-performance threshold in both literacy and numeracy (not considered at risk of educational poverty).
- Top-right quadrant: Students with scores below Level 1 in literacy but not in numeracy.
- Bottom-left quadrant: Students with scores below Level 1 in numeracy but not in literacy.
- Bottom-right quadrant: Students who are low performers in both literacy and numeracy (considered at high risk of educational poverty).

Our analysis focuses on pupils who were low performers in both numeracy and literacy.

Table 2. Low performer category (source PISA2022 Italy)

	Low performance reading		Total
	0	1	
0	68,3%	4%	72,3%
Low performance math			
1	11,9%	15,8%	27,7%
Total	80,2%	19,8%	100%

Source: Authors' elaboration of OECD PISA 2022 data.

In our analysis, we focus on the 15.8% of students who are classified as low performers in both literacy and numeracy. We examine the relationship between this condition and key variables such as school track, gender, geographical area of residence, and socio-economic status, with the aim of identifying potential mechanisms contributing to educational inequality. In the subsequent section, we further investigate how low performance is associated with students' educational and occupational aspirations.

The PISA 2022 data reveal that school track remains a significant predictor of low performance. Among students enrolled in general academic schools (*licei*), only 7% fall into the low performer category. This proportion increases considerably in other tracks: 19.7% of students in *istituti tecnici* (technical schools) and 40.3% in *istituti professionali* (vocational schools) are classified as low performers. These findings underscore the extent to which school pathways contribute to the reproduction of educational disadvantage.

Table 3. Low performer vs school track

	Academic (Liceo)	Technical (Istituto tecnico)	Vocational (istituto professionale)	Total
Non low performance	93%	80,3%	59,7%	84,7%
Low performance	7%	19,7%	40,3%	15,3%
Total	100%	100%	100%	100%

Source: Authors' elaboration of OECD PISA 2022 data

The findings on performance decline and learning loss, particularly among students from vocational tracks and disadvantaged regions, offer crucial insights into how educational impoverishment translates into reduced horizons of expectation.

Table 4 Low performer vs geographical area

Performance	Centre	North- Est	North- West	South	South- Islands	Total
Non low performance	86,3%	91,4%	91,2%	73%	76,5	84,2%
Low performance	13,7%	8,6%	8,8%	27%	23,5%	15,8%
Total	100%	100%	100%	100%	100%	100%

Source: Authors' elaboration of OECD PISA 2022 data.

In the following section, we examine how this erosion of competencies - intensified by pandemic disruptions - shapes students' capacity to aspire and project themselves into socially recognised occupational roles.

Educational Trajectories and Job expectations

Building on the theoretical framework and empirical analyses developed in the previous sections, this part of the study explores how students' educational and occupational expectations are shaped within the Italian school system.

After highlighting the extent and determinants of low academic performance - particularly among students from disadvantaged backgrounds - this section shifts the focus to the forward-looking dimension of student aspirations. Drawing on PISA 2022 data, we examine how academic track, social

origin, and performance levels influence both the desire to pursue tertiary education and the expectations regarding future occupational status.

Special attention is given to underachieving students, whose capacity to aspire is often constrained not only by their results but also by the educational environments and socio-cultural signals that shape their perceived horizons of possibility. By doing so, we aim to shed light on the cumulative effects of inequality in the transition from school to work.

In the initial stage of our analysis, we employed Ordinary Least Squares (OLS) regression to estimate two models. The first model (Model 1) used students' numeracy scores as the dependent variable, while the second model (Model 2) focused on literacy scores. The primary aim was to assess the extent to which students' social background, gender, geographical location, migration status, and educational track influenced their performance in the PISA assessment (Table 5).

Table 5. Determinants of competencies in numeracy and literacy (OLS models)

	Mod.1 – Math (R ² = 34,5 %)			Mod.2 – Reading (R ² = 30.5%)		
	B	Beta	Sign.	B	Beta	Sign.
ESCS medium-low vs ESCS low	11,55	0,06	0,000	11,85	0,06	0,000
ESCS medium-high vs ESCS low	17,03	0,09	0,000	16,72	0,09	0,000
ESCS high vs ESCS low	38,01	0,20	0,000	32,97	0,17	0,000
Girl vs Boy	-29,90	-0,18	0,000	9,32	0,06	0,000
Non-native vs native	-15,84	-0,06	0,000	-19,01	-0,07	0,000
Grade repetition vs regular	-41,52	-0,13	0,000	-34,64	-0,11	0,000
North-Est vs Centre	33,54	0,16	0,000	28,87	0,14	0,000
North-West vs Centre	33,22	0,17	0,000	24,05	0,13	0,000
South vs Centre	-29,80	-0,14	0,000	-29,17	-0,14	0,000
South-Islands vs Centre	-31,63	-0,14	0,000	-30,17	-0,13	0,000
General track vs vocational track	79,60	0,47	0,000	83,08	0,49	0,000
Technical track vs vocational track	43,70	0,24	0,000	39,85	0,22	0,000
Constant	416,88		0,000	410,78		0,000

Source: Authors' elaboration of OECD PISA 2022 data.

In both models, school track is the strongest predictor of PISA performance. Students in general academic tracks outperform those in vocational ones by around 80 points in numeracy and 83 in literacy, confirming the well-documented school track effect in Italy, where early selection contributes to educational stratification (Giancola & Salmieri, 2020; Barone et al., 2021). Tracks function as institutional filters, often reinforcing rather than mitigating social advantage.

Family background shapes access to academic tracks and achievement. Students from advantaged families are more likely to enrol in general tracks, benefiting from both direct effects - such as cultural capital (Bourdieu & Passeron, 1970) - and indirect ones through school choice (Boudon, 1974; Jackson, 2013). This dual influence underlies a chain effect of inequalities, in which early disadvantages accumulate (Giancola & Salmieri, 2022), particularly in Southern Italy, where vocational tracks absorb a disproportionate share of disadvantaged students (Giancola & Salmieri, 2020).

Even controlling for track, socio-economic status matters: pupils in the highest ESCS quartile score 38 points higher in numeracy and 33 in literacy than those in the lowest, partly due to indirect effects on school placement (Benadusi & Giancola, 2014).

Grade repetition is linked to substantially lower performance (-42 in numeracy, -37 in literacy), especially for students from disadvantaged backgrounds. Rather than compensating for gaps, repetition often reinforces them (Carriero et al., 2014). International evidence confirms that retention disproportionately harms lower-SES students, undermining confidence and increasing disengagement (Blanco-Varela & Amoedo, 2024).

Persistent gender gaps also emerge, with pedagogical practices and expectations reinforcing stereotypes - such as girls excelling in literacy and boys in numeracy - thus widening performance differences (De Vita & Giancola, 2017; Logan & Johnston, 2010; Solheim & Lundetræ, 2018; Jaoul-Grammare, 2024).

Furthermore, students with an immigration background score 16 points lower in numeracy and 19 in literacy than native peers, reflecting enduring racialised inequalities in Italian schools (Volante et al., 2018). These intersect with socio-economic disadvantage, creating compounded effects.

In the second step of the analysis, we conducted a logistic regression to examine the factors contributing to low performance among students in both literacy and numeracy (Table 6). The results reveal that territorial disparities significantly affect student outcomes: pupils residing in Southern Italy and the islands are more than twice as likely to be low performers compared to their peers in Central regions. This finding reflects longstanding patterns of educational poverty and unequal provision across the national territory, where schools in socio-economically disadvantaged areas tend to offer fewer

resources and reduced opportunities for learning (Giancola & Salmieri, 2020; Azzolini et al., 2012).

Grade repetition also increases the likelihood of being a low performer, confirming its role not as a compensatory tool but as a mechanism that contributes to cumulative disadvantage. Students who have repeated a school year are significantly more likely to fall behind, especially when repetition intersects with other vulnerabilities such as low socio-economic status or geographic marginality (Giancola & Salmieri, 2022, 2023). Similarly, a migration background raises the probability of being a low performer by 1.5 times compared to Italian students. This supports the view that immigrant-native educational gaps are not solely explained by individual or cultural deficits but are deeply rooted in structural inequalities within the school system (Azzolini et al., 2012).

By contrast, attending a general academic track reduces the probability of being a low performer by around 87%, and a higher socio-economic background decreases it by approximately 55%. These results corroborate earlier findings that educational tracks in Italy function as selective pathways, whose benefits are disproportionately accessed by students from privileged backgrounds (Azzolini & Vergolini, 2014). The school system, rather than compensating for early disadvantage, often channels it into differentiated and unequal trajectories.

Students' educational expectations are shaped by a complex interplay of ascriptive characteristics and structural opportunities (Lee, 2014; Giancola & Salmieri, 2020). Drawing on the framework of the chain effect of inequalities, we hypothesise that early school choices, academic performance, and tracking mediate the influence of social background on aspirations for higher education. In this context, school tracks are not neutral pathways but institutional mechanisms that often reproduce and solidify social inequalities (Giancola & Salmieri, 2022, 2023).

In Italy, tracking has been shown to influence students' expectations both directly - through the content and prestige associated with different school types - and indirectly, via selection processes tied to social origin, gender, and migration background (Biemmi, 2015; De Vita & Giancola, 2017). Gender plays a particularly important role: research has shown that stereotypes and social norms continue to shape subject preferences and educational choices, leading to divergent trajectories for boys and girls (Duru-Bellat, 2004; Hägglund & Leuze, 2021; Arnaboldi et al., 2025). Teachers' expectations, gendered role models, and representations of academic success reinforce these differentiated aspirations, often before students reach the end of compulsory schooling (Biemmi, 2015).

Table 6 Low performing determinants – binary logistic regression ($R^2 = 25,3\%$)

	B	Exp(B)	95% C.I. for EXP(B)	
			Lower	Upper
ESCS medium-low vs ESCS low	-0,37	0,69	0,68	0,71
ESCS medium-high vs ESCS low	-0,40	0,67	0,66	0,69
ESCS high vs ESCS low	-0,81	0,45	0,43	0,46
Girl vs Boy	-0,19	0,83	0,82	0,85
Non-native vs native	0,41	1,51	1,47	1,56
Grade repetition vs regular	0,82	2,28	2,22	2,34
North-Est vs Centre	-0,76	0,47	0,45	0,48
North-West vs Centre	-0,74	0,48	0,46	0,49
South vs Centre	0,83	2,29	2,22	2,35
South-Islands vs Centre	0,83	2,29	2,23	2,36
General track vs vocational track	-2,05	0,13	0,13	0,13
Technical track vs vocational track	-0,94	0,39	0,38	0,4
Constant	-0,36	0,7		

Source: All coefficients are fully significant. Authors' elaboration of OECD PISA 2022 data.

From a sociological perspective, aspirations can also be understood as a cultural capacity unequally distributed across social groups. According to Appadurai (2004), the capacity to aspire is shaped by one's social position and access to the cultural and symbolic resources that make certain futures imaginable. Moreover, students are not merely passive recipients of structural constraints: they express forms of bounded agency, elaborating strategies, hopes, and resistances within their social conditions - a dynamic explored by Willis (1977) and Beaud (2002) in classic sociological studies of school trajectories (Mkwanzani & Melis Cin, 2020).

Particular attention must also be paid to students with a migrant background. Their educational expectations reflect not only structural inequality, but also cultural negotiation and intergenerational change. First-generation immigrant students are often doubly disadvantaged: they are overrepresent-

ed in vocational tracks and less likely to aspire to higher education compared to native peers (Azzolini & Barone, 2013; Minello & Barban, 2012). However, second-generation students tend to develop higher expectations, especially when integrated into socially mixed and inclusive school environments (Minello, 2014).

Cultural and gender norms within families also influence expectations. Autiero and Nese (2023) show that family cultural background significantly affects aspirations to tertiary education, with girls generally more responsive to the opportunities provided by the host context and boys more influenced by traditional expectations. The school environment further shapes aspirations: exposure to high-achieving or high-aspiring peers can raise educational ambitions among migrant-background students (Minello, 2014). In this sense, integration functions not only as a compensatory factor but also as a multiplier of aspirations, depending on school context and peer effects.

To further explore the domino effect of inequalities - examining not only the likelihood of low performance, but also how structural and social conditions shape students' future educational ambitions - we estimated a binomial logistic regression model using a binary variable indicating students' intention to enrol in tertiary education (Table 7).

We estimated two logistic regression models to examine factors associated with students' expectations of enrolling in tertiary education (Table 7). The first model included ascriptive variables, while the second introduced dummy variables for low performance in mathematics, reading, or both.

In both models, school track emerged as the most influential factor. Students enrolled in general or technical tracks were over four and three times more likely, respectively, to aspire to higher education than their peers in vocational tracks. This finding reinforces the idea that school pathways in Italy serve as institutional sorting mechanisms, reproducing social hierarchies rather than simply reflecting ability (Giancola & Salmieri, 2022, 2023). As Boudon (1974) and Jackson (2013) argue, such outcomes reflect secondary effects of social origin, where educational decisions are shaped by class-based expectations and access to cultural capital (Bourdieu & Passeron, 1970).

Gender also plays a significant role. Girls display higher aspirations toward tertiary education, consistent with the ongoing feminisation of university participation in Italy. These patterns are shaped by both structural factors and cultural narratives around success in school, particularly outside STEM fields (Biemmi, 2015; Hägglund & Leuze, 2021; Arnaboldi et al., 2025). Teachers' expectations and the visibility of female role models further support these aspirations (De Vita & Giancola, 2017), though they also reflect broader gendered divisions in occupational expectations (Duru-Bellat, 2004).

Table 7. Determinants of educational aspirations (binary logistic regression)

	Mod.1 (R ² = 13,2 %)			Mod.2 (R ² = 13,9 %)		
	B	Sign.	Ex- p(B)	B	Sign.	Ex- p(B)
ESCS medium-low vs ESCS low	0,46	0,000	1,59	0,43	0,000	1,54
ESCS medium-high vs ESCS low	0,58	0,000	1,78	0,54	0,000	1,72
ESCS high vs ESCS low	1,05	0,000	2,84	0,99	0,000	2,69
Girl vs Boy	0,31	0,000	1,36	0,34	0,000	1,40
Non-native vs native	0,08	0,000	1,08	0,11	0,000	1,12
Grade repetition vs regular	-0,05	0,001	0,96	0,03	0,037	1,03
North-Est vs Centre	0,10	0,000	1,11	0,03	0,024	1,03
North-West vs Centre	0,18	0,000	1,19	0,12	0,000	1,13
South vs Centre	0,19	0,000	1,21	0,27	0,000	1,31
South-Islands vs Centre	0,26	0,000	1,30	0,35	0,000	1,42
General track vs vocational track	1,52	0,000	4,59	1,37	0,000	3,94
Technical track vs vocational track	1,29	0,000	3,64	1,21	0,000	3,36
Low performers math				-0,48	0,000	0,62
Low performers reading				-0,42	0,000	0,66
Low performers in both				0,47	0,000	1,59
Constant	-0,79	0,000	0,46	-0,54	0,000	0,59

Source: Authors' elaboration of OECD PISA 2022 data.

Socio-economic background remains a key determinant. Students from medium-high and high ESCS backgrounds are significantly more likely to express aspirations for higher education, due to both direct resources and indirect influence through earlier educational choices, such as track selection (Benadusi & Giancola, 2014). These findings align with the chain effect of inequalities (Giancola & Salmieri, 2022), highlighting how background, school experiences, and performance accumulate to shape expectations.

Although smaller in magnitude, migration background also shows a positive, significant effect. Non-native students, especially second-generation immigrants, tend to maintain high aspirations - likely influenced by family expectations and peer environments (Azzolini & Barone, 2013; Minello & Barban, 2012). Gendered family norms and opportunities in the host society play a role, with girls in migrant families showing particularly elevated expectations (Autiero & Nese, 2023; Minello, 2014). Inclusive school contexts may amplify these ambitions.

Finally, controlling for academic performance slightly attenuates the strength of other variables but does not diminish their overall significance. This suggests that expectations are shaped by more than achievement alone - they reflect broader social positioning. As Appadurai (2004) notes, the capacity to aspire is unequally distributed, depending on access to symbolic and material resources. And as shown by Willis (1977) and Beaud (2002), students' aspirations emerge through bounded agency, as they navigate institutional opportunities and constraints.

Within students' educational trajectories, school choices, academic performance, and study aspirations contribute - both directly and indirectly - to the formation of occupational expectations. As illustrated in Table 8, these elements interact through a cumulative logic, generating a chain effect that tends to reinforce either advantage or disadvantage over time.

In the final part of our analysis, we turn to students' occupational expectations, as measured by the BMSJ index - an indicator developed by the OECD to estimate students' expected socio-professional status. This shift allows us to explore how school experiences, educational choices, and aspirations translate into imagined futures, offering further insight into the chain effect of inequalities (Tab. 8).

We estimated four OLS regression models. The first model, based on ascriptive characteristics and educational background, reveals that school track, socio-economic status, and gender are strong predictors of job expectations. Girls report higher aspirations toward prestigious occupations - a pattern aligned with their tertiary education expectations and consistent with gendered educational trajectories (De Vita & Giancola, 2017).

Table 8 Determinants of occupational expectations (OLS)

	Mod.1 (R2=23,9%)		Mod.2 (R2=25,1%)		Mod.3 (R2=26,7%)		Mod.4 (R2=27,6%)	
	B	Beta	B	Beta	B	Beta	B	Beta
ESCS medium-low vs ESCS low	3,29	0,07	2,784	0,06	2,44	0,05	2,01	0,05
ESCS medium-high vs ESCS low	4,51	0,10	3,862	0,09	3,48	0,08	2,97	0,07
ESCS high vs ESCS low	6,40	0,15	5,600	0,13	4,79	0,11	4,18	0,10
Girl vs Boy	5,31	0,14	5,374	0,14	4,91	0,13	4,94	0,13
Non-native vs native	3,33	0,05	3,703	0,06	2,89	0,04	3,20	0,05
Grade repetition vs regular	-1,09	-0,01	*-0,097	0,00	-1,03	-0,01	*-0,17	0,00
North-Est vs Centre	2,06	0,04	1,427	0,03	1,39	0,03	0,89	0,02
North-West vs Centre	1,23	0,03	0,754	0,02	0,62	0,01	0,23	0,01
South vs Centre	-0,30	-0,01	0,621	0,01	-0,55	-0,01	0,24	0,01
South-Islands vs Centre	-0,50	-0,01	0,464	0,01	-1,21	-0,02	-0,41	-0,01
General track vs vocational track	23,11	0,58	21,054	0,53	20,47	0,52	18,91	0,48
Technical track vs vocational track	12,68	0,29	11,577	0,27	10,49	0,24	9,70	0,22
Low performers math			-3,186	-0,05			-2,28	-0,05
Low performers reading			-4,754	-0,05			-4,78	-0,09
Low performers in both			-6,785	-0,11			1,28	0,02
Tertiary ed. expectation vs upper secondary or lower					8,39	0,17	8,03	0,17
Constant	41,86		45,07		39,08		41,86	

All coefficients are fully significant except those marked with an asterisk
 Source: Authors' elaboration of OECD PISA 2022 data.

Adding performance variables in Model 2 shows that low performers, particularly those struggling in both reading and maths, envision significantly lower occupational futures. This reinforces the idea that educational poverty - understood not just as lack of access, but as reduced capacity to benefit from school - has enduring effects. These patterns resonate with the literature on learning loss, particularly in post-pandemic contexts, where disadvantaged students have faced disproportionately higher educational setbacks (Giancola & Salmieri, 2020). The learning loss is not merely academic: it reverberates in diminished aspirations, reduced access to knowledge, and constrained occupational projections.

Model 3 includes students' educational expectations, which emerge as a powerful driver of future job status. Aspiring to complete tertiary education significantly raises students' projected socio-professional position, suggesting that aspirations function not only as reflections of past experiences but also as symbolic resources oriented toward the future.

Model 4, which includes all variables, confirms a cumulative dynamic: background, school pathway, performance, and aspirations intersect to shape occupational outcomes. The improvement in explained variance ($R^2 = 27.6\%$) supports the interpretation of a domino effect, particularly among students from disadvantaged regions or migrant backgrounds, where multiple forms of vulnerability converge.

The analysis reveals that grade repetition exerts a significant negative effect in Models 1 and 3, where the variables identifying students with low performance in reading and mathematics are not included. In Models 2 and 4, however, this effect loses statistical significance. This pattern suggests that grade repetition does not operate as an independent factor but rather reflects a broader condition of educational disadvantage. In other words, its impact is absorbed by the low performer profile, indicating that school trajectories are shaped less by isolated events and more by cumulative processes of stratification.

These results underscore how educational trajectories are embedded in broader structures of inequality. Drawing on Appadurai's (2004) notion of the capacity to aspire, we can interpret job expectations not as simple individual preferences, but as socially produced representations of what is possible. In contexts marked by territorial educational poverty and structural learning loss, the ability to project oneself into socially valued occupations is unevenly distributed, reinforcing long-standing divides in access to mobility and opportunity (Giancola & Salmieri, 2020; Azzolini et al., 2012).

Discussion and Conclusion

The study presented in this paper contributes to the literature on educational inequality by providing a comprehensive empirical examination of the cumulative “chain effect” linking social origin, school tracking, and low academic performance to both educational and occupational expectations. Unlike previous studies, it focuses on low-performing students as a systematically positioned group within stratified educational structures, highlighting how institutional and socio-structural factors jointly shape future aspirations. Focusing on the specific historical context in which the PISA 2022 data collection is embedded, the impact of the COVID-19 pandemic appears to have significantly exacerbated existing inequalities in Italy, deepening pre-existing conditions of educational, economic, and social disparity (Giancola & Salmieri, 2024). More than ever, social background plays a crucial role in determining individuals’ educational and life trajectories. Drawing on the concept of the chain effect (Giancola & Salmieri, 2022), our findings indicate that social origin, institutional factors, and academic performance interact in a structured, mutually reinforcing manner. This interaction generates stratified trajectories that extend beyond academic outcomes to shape students’ aspirations and future-oriented expectations. Our analysis highlights how social background directly and indirectly influences school choices, academic performance, aspirations toward tertiary education, and ultimately, expectations regarding labour market integration. These processes are further shaped by gender, migrant background, and geographic location, resulting in cumulative configurations of advantage and disadvantage.

Students performing poorly in both reading and mathematics, representing 15.8% of the Italian sample in PISA 2022, provide a crucial case to understand cumulative disadvantage. They are characterised not only by lower academic performance but also by systematically constrained educational and occupational expectations (Giancola & Salmieri, 2023). In this sense, students’ expectations should be understood not merely as passive reflections of structural inequality, but as socially shaped orientations that may contribute to its reproduction, reinforcing long-term risks of social exclusion, including the likelihood of becoming NEET (Villani, 2026). A key finding concerns gender differences: girls generally demonstrate higher academic performance and express higher educational and professional aspirations compared to boys. This presents a notable paradox, given persistent gender disparities in the Italian labour market regarding wages, working conditions, and career opportunities (De Vita & Giancola, 2017).

We propose three complementary explanations for this paradox. First, girls might adopt a rational choice approach (Boudon, 1973, 2003), strategically investing in education as a means to mitigate structural inequalities

in the labour market. Second, gender socialisation imposes societal expectations that encourage girls to conform to “good girl” roles (Arnaboldi et al., 2025; Connell, 2011; Ghigi, 2019; Ruspini, 2023), indirectly influencing academic performance and career aspirations. Third, teachers play a critical role through gender-differentiated pedagogical practices, generating higher academic expectations for girls from as early as primary education (Benvenuto & Szpunar, 2017; Leonelli, 2011; Szpunar, 2022). These explanations enrich our understanding of gender differences in educational pathways and employment opportunities, though further factors remain unidentified, highlighting the need for additional research.

Based on our findings, there is a strong need for targeted educational policies aimed at mitigating cumulative inequalities. Interventions are particularly necessary in vocational and technical schools, disadvantaged regions, and among students from migrant backgrounds, ensuring adequate educational resources to narrow opportunity gaps and support young people’s futures. Future research should further explore the interplay between gender, social background, and institutional contexts, examining how these variables influence educational choices, academic outcomes, and future aspirations. Particular attention should also be paid to pedagogical practices and inclusive school environments in addressing these inequalities.

Our findings underscore how early tracking and socio-economic background reinforce disadvantage, shaping not only academic outcomes but also students’ capacity to aspire to higher education and desired occupations. By focusing on low-performing students, the study highlights the role of educational structures in reproducing inequalities, offering evidence-based insights for targeted policy interventions that foster inclusive pathways and support vulnerable groups.

In this perspective, particular attention should be devoted to the design of early and continuous guidance policies. Orientation should not be conceived as a one-off intervention at key transition points, but rather as a structured and cumulative process aimed at reducing informational asymmetries about educational pathways and post-school opportunities. Ensuring that students - especially those from less advantaged backgrounds - have access to clear, reliable, and context-sensitive information is crucial to support informed decision-making (Giancola, 2026; Giancola, Piromalli, 2024, 2026). Effective guidance policies, combined with stronger links between schools, tertiary education institutions, and the labour market, can play a key role in expanding students’ horizons of action and in counteracting the socially patterned constraints that limit their educational and occupational trajectories. As educational inequalities risk becoming entrenched, timely interventions through inclusive policies and targeted investments are imperative. Such measures are essential to break the chain of disadvantage and enable all

young people, regardless of social background, gender, or migrant origin, to pursue dignified and socially valued futures.

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