



How students progress through schooling

This chapter examines how students progress through schooling, based on government regulations, family decisions and students' own performance and interests. It discusses such issues as the length and duration of schooling, pre-primary education, and grade repetition, and examines the relationships between these factors, on the one hand, and student performance and equity in education, on the other.

The vertical structure of an education system refers to the sequence of grades and levels of instruction that students must progress through in order to complete their schooling.¹ National laws and regulations formally define this sequence by establishing the age at which students are expected to enter pre-primary, primary, and lower and upper secondary school; the duration of these levels of education; and the requirements for students' entry and graduation.

The formal structures of national education systems define the way those systems are supposed to work; but in practice, schools, which have been described as “loosely coupled” organisations, often deviate from formal institutional requirements in order to solve everyday problems (Weick, 1976_[1]; Aurini, 2012_[2]; Meyer and Rowan, 2006_[3]). For example, as documented in this chapter, many students enter pre-primary or primary school at an age that is different from the “theoretical” age at entry established in national legislation. School-entry laws and students' actual age at entry into school can have long-term consequences on their performance and educational attainment (Bedard and Dhuey, 2006_[4]; Datar, 2006_[5]; Dobkin and Ferreira, 2010_[6]). Similarly, some students stay in primary or secondary school longer than others do, often because of grade repetition, while some drop out of school without completing their programme. System-level policies, school characteristics and practices, students' family background and other outside-of-school experiences are associated with the odds of successfully progressing from one instructional grade or level to the next, and of entering higher education (Shavit and Blossfeld, 1993_[7]; Pallas, 2003_[8]).

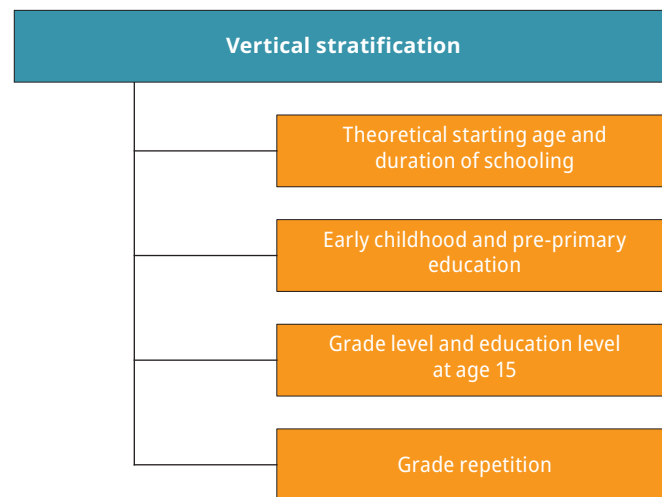
What the data tell us

- Across countries and economies that participated in PISA 2018, the most common vertical structure of the education system is that students enter pre-primary education at age 3, enter primary education at age 6, enter lower secondary education at age 12, enter upper secondary education at age 15 and attend this level for 3 years.
- On average across OECD countries, 6% of students had not attended or had attended pre-primary education for less than one year. These students scored lower in reading at the age of 15 than students who had attended for one year, two years or three years, before and after accounting for students' and schools' socio-economic profile.
- On average across OECD countries, a socio-economically disadvantaged 15-year-old student was about three times more likely than an advantaged student to have repeated a grade at least once, even if both students scored the same in the PISA reading test. At the system level, across all participating countries and economies, countries/economies with smaller shares of students who had repeated a grade generally showed higher mean reading performance and greater equity in reading performance, even after accounting for per capita GDP.
- Countries/economies with more students in the modal grade showed greater equity in student performance. Across all participating countries and economies, the correlation between the percentage of students in the modal grade and equity in reading performance was statistically significant, even after accounting for per capita GDP.

This chapter starts by describing the length and duration of schooling in each PISA-participating country and economy. It then considers pre-primary education, which has become a normal – and often compulsory – part of students' trajectory through education. The chapter examines the amount of time that students spend in pre-primary education and how that is related to students' academic achievement at age 15.

The third section of the chapter considers the variation in grade and education levels amongst 15-year-old students in PISA-participating countries/economies. The final section examines grade repetition.

Figure V.2.1 Vertical stratification as covered in PISA 2018



THE DURATION AND ORGANISATION OF SCHOOLING

Through its system-level questionnaire, PISA 2018 asked countries to report the age, established by law and regulation, at which students enter pre-primary, primary, lower secondary and upper secondary education (the theoretical starting age). The system-level questionnaire also asked how many years of schooling a student is expected to complete before graduating from each of these levels (the theoretical duration or length). Figure V.2.2 summarises this information. Data collected through the system-level questionnaire is different from the PISA 2018 data collected from students and parents (see Annex B3). The theoretical structure of education systems does not necessarily reflect national legislation on “compulsory schooling” (i.e. compulsory schooling might include only some of the education levels or years of schooling represented in Figure V.2.2).

Students’ expected trajectories through schooling vary considerably across countries. While in some countries the typical duration of schooling is 13 years from entry into pre-primary to the end of upper secondary education (this is the case in Costa Rica, Malaysia, the Philippines and Singapore), in the majority of countries it is either 15 or 16 years. In Iceland, regulations establish that students complete as many as 17 years of schooling, from their entry into pre-primary education, before they can graduate from high school.

The International Standard Classification of Education (ISCED) is a framework for organising information on education. ISCED facilitates the transformation of national education frameworks, concepts and definitions, into aggregate categories that can be compared and interpreted internationally. Across the 77 countries and economies that participated in PISA 2018 for which data are available, the most common or typical mapping of national concepts into the ISCED adhered to the following vertical structure of the education system:

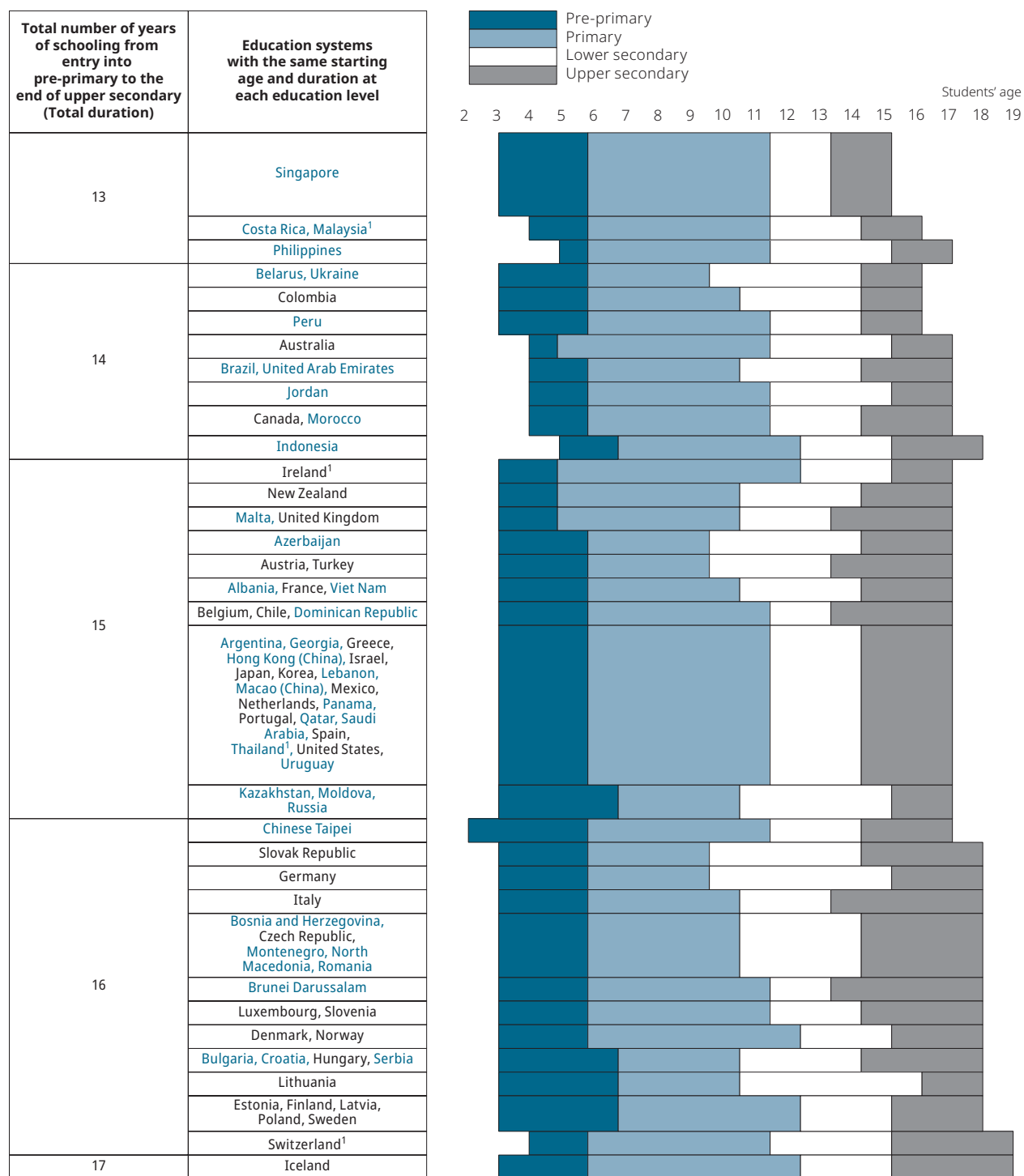
- enter pre-primary education at age 3 and attend this level for 3 years
- enter primary education at age 6 and attend this level for 6 years
- enter lower secondary education at age 12 and attend this level for 3 years
- enter upper secondary education at age 15 and attend this level for 3 years.

In this structure, students are expected to complete 15 years of education (if only primary and secondary levels are considered, not including pre-primary, students are expected to complete 12 years of education). The education systems of 19 countries and economies, namely Argentina, Georgia, Greece, Hong Kong (China), Israel, Japan, Korea, Lebanon, Macao (China), Mexico, the Netherlands, Panama, Portugal, Qatar, Saudi Arabia, Spain, Thailand, the United States and Uruguay, are structured this way.

In most education systems, children are expected to enter pre-primary education at age three, but in Chinese Taipei regulations mandate that children enter at age two, while in nine other countries the theoretical starting age for pre-primary education is four; in Indonesia and the Philippines, children are expected to enter pre-primary education at age five. Pre-primary education lasts for 3 years in most systems, but in 14 countries and economies it lasts for 4 years while in Australia and the Philippines it lasts for only 1 year.

Figure V.2.2 The vertical structure of education systems

Theoretical starting age and theoretical duration of pre-primary, primary and secondary education



1. For these countries, the theoretical duration (in years) of each education cycle was derived based on data on theoretical starting age.
Note: Theoretical starting age is the age at which students are expected to enter an education level according to national law or regulation. The theoretical duration is the number of years of schooling a student is expected to complete before graduating from an education level according to law or regulation. Countries are shown in ascending order of the total number of years of schooling from entry into pre-primary to the end of upper secondary. Amongst education systems with the same total duration, countries are shown in ascending order of the age at entry into pre-primary education, followed by the age at entry into primary education, lower secondary and upper secondary education.

Source: OECD, PISA 2018 Database, Table B3.3.1.

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The theoretical age at entry into primary school is 6 in most countries and economies, but in 14 countries/economies it is 7, and in Australia, Ireland, Malta, New Zealand and the United Kingdom it is 5. Countries where the duration of primary education is the longest are Ireland (eight years) and Australia, Denmark, Iceland and Norway (seven years each). By contrast, in Austria, Azerbaijan, Belarus, Bulgaria, Croatia, Germany, Hungary, Kazakhstan, Lithuania, the Republic of Moldova, the Russian Federation, Serbia, the Slovak Republic, Turkey and Ukraine, primary schooling lasts four years. In 12 countries, namely Albania, Bosnia and Herzegovina, Brazil, Colombia, the Czech Republic, France, Italy, Montenegro, the Republic of North Macedonia (hereafter “North Macedonia”), Romania, the United Arab Emirates and Viet Nam, the theoretical duration of primary education is five years, and in another 45 countries and economies, the duration of primary education is six years.

In the northern European countries of Denmark, Estonia, Finland, Iceland, Norway and Sweden, and also in Ireland, Latvia and Poland, the combined duration of pre-primary and primary education is 10 years – one year longer than in most education systems. In these countries, and in Indonesia, students are expected to enter lower secondary education at age 13. By contrast, in Austria, Azerbaijan, Belarus, Germany, the Slovak Republic, Turkey and Ukraine, students are expected to enter lower secondary education at age 10. In most countries and economies, the theoretical age at entry into lower secondary education is 12.

In most countries/economies, secondary education (lower and upper secondary combined) lasts six years, but in Germany and the Slovak Republic, where the theoretical age at entry is youngest, secondary education lasts nine years. By contrast, in Singapore, lower and upper secondary education lasts only four years. Singapore’s education system is unique in that completing the education cycle from the first grade of primary school through the last grade of upper secondary school takes only ten years – less than in any other country. This is because, in Singapore, the duration of lower secondary (two years) and upper secondary (two years) is brief by international standards. By contrast, the duration of pre-primary and primary education in Singapore is the same as the typical vertical structure in PISA-participating countries and economies.

PRE-PRIMARY EDUCATION

Evidence about the importance of high-quality pre-primary education is growing (OECD, 2018^[9]; Heckman, 2006^[10]). In parallel, over the past few decades, enrolment in pre-primary education has become more prevalent across countries around the world (UNESCO Institute for Statistics, 2012^[11]; OECD, 2018^[12]). Research suggests that a variety of outcomes can be boosted by high-quality pre-primary education, including children’s cognitive development and well-being, later academic achievement and even adult earnings (Duncan et al., 2007^[13]; Nordic Council of Ministers, 2012^[14]). Attendance at pre-primary school has been shown to improve students’ behaviour, attention, effort and class participation in primary school (Berlinski, Galiani and Gertler, 2009^[15]). In addition, early education programmes are cost-effective interventions with substantial economic returns to investment (Heckman et al., 2010^[16]).

The benefits of attendance at pre-primary education tend to be greater for socio-economically disadvantaged children (Suziedelyte and Zhu, 2015^[17]). However, the benefits also depend on the quality of the early childhood education and care, as defined by positive staff-child interactions and more exposure to developmental activities, amongst other factors (Melhuish et al., 2015^[18]).

Data from PISA 2018 show that most 15-year-old students had attended pre-primary education for three years or more² (56% of students), two years (24%), or one year (14%), on average across OECD countries (Table V.B1.2.1).³ In 59 countries and economies, at least 85% of students had attended for at least one year. In Belgium, Beijing, Shanghai, Jiangsu and Zhejiang (China), Denmark, France, Hong Kong (China), Hungary, Iceland, Israel, Japan, Macao (China), Mexico, Singapore, Chinese Taipei and Thailand, attending pre-primary education for at least one year is virtually universal (more than 98% of students had done so).

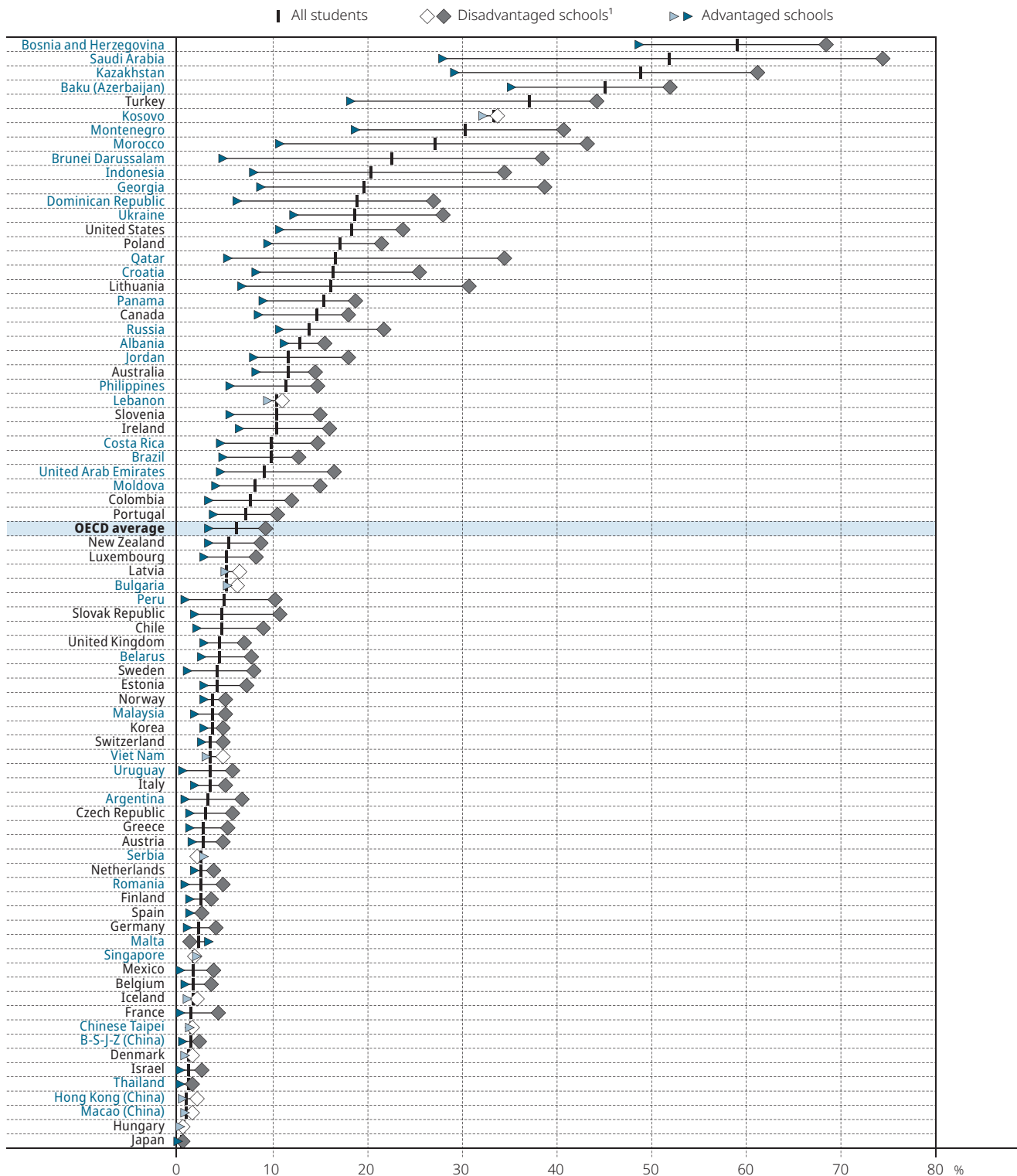
Cross-national variations in attendance at pre-primary education may be related to several factors. For example, some countries may have lower rates of pre-primary attendance due to longer parental leave, or because there is a culture where infants are cared for in the home. Other countries may offer earlier access to primary education and therefore there is less time between birth and primary school for attendance at pre-primary education. Differences in the age at entry into primary education across countries result in disparities in the number of years students could have attended pre-primary education.

The number of years students spend in pre-primary education has increased over time in many countries. Between PISA 2015 and PISA 2018, in 41 of 54 countries and economies with available data, the share of students who had attended pre-primary education for three years or more increased. In 17 countries and economies, the share of students who had not attended or had attended pre-primary education for less than one year decreased during the same period; and in 22 countries/economies, the share of students who had attended pre-primary education for one year decreased between 2015 and 2018.

Despite this expansion in enrolment in pre-primary education, about 6% of students in PISA 2018 reported that they had not attended or that they had attended pre-primary education for less than one year, on average across OECD countries (Figure V.2.3). More than 30% of students in Baku (Azerbaijan), Bosnia and Herzegovina, Kazakhstan, Kosovo, Montenegro, Saudi Arabia and Turkey had attended pre-primary school for less than one year or had not attended at all.

Figure V.2.3 **Students who had not attended pre-primary education, by schools' socio-economic profile**

Percentage of students who had not attended pre-primary education or had attended for less than a year



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS). A socio-economically disadvantaged (advantaged) school is a school in the bottom (top) quarter of the index of ESCS in the relevant country/economy.

Note: Statistically significant differences between advantaged and disadvantaged schools are marked in a darker tone (see Annex A3).

Countries and economies are ranked in descending order of the percentage of students who had not attended pre-primary education or had attended for less than a year.

Source: OECD, PISA 2018 Database, Table V.B1.2.2.

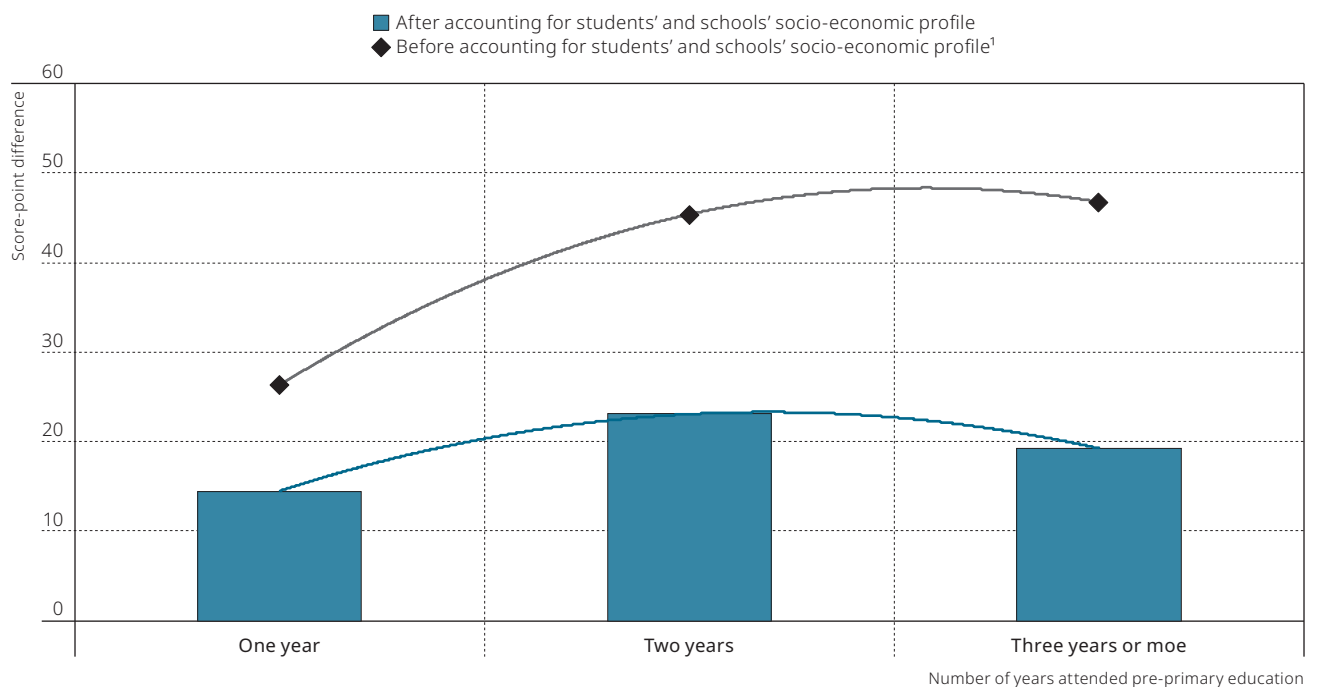
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In 67 out of 78 countries and economies for which there are comparable data, students who had not attended pre-primary education were more likely to be those enrolled in socio-economically disadvantaged schools (Figure V.2.3). On average across OECD countries in 2018, 10% of socio-economically disadvantaged students but 3% of advantaged students had not attended or had attended pre-primary education for less than one year.

Students who had attended pre-primary education for longer scored better in reading than students who had not attended (Figure V.2.4).⁴ On average across OECD countries, the mean reading score of students who had attended pre-primary education for one year (471 points), two years (491 points) or three years or more (493 points) was higher than the score of students who had not attended or had attended for less than one year (444 points) (Table V.B1.2.4). There was a positive relationship between attendance at pre-primary education and student achievement at age 15 when the student had attended pre-primary school for up to 2 years. But no performance difference was observed between students who had attended pre-primary education for two years and those who had attended for three years or more, both before and after accounting for students' and schools' socio-economic profile.

Figure V.2.4 **Number of years in pre-primary education and reading performance**


Score-point difference in reading relative to students who had not attended pre-primary school or had attended for less than a year, OECD average



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

Note: Statistically significant values are shown in darker tone (see Annex A3). The lines in the figure are included for illustrative purposes only.

Source: OECD, PISA 2018 Database, Table V.B1.2.5.

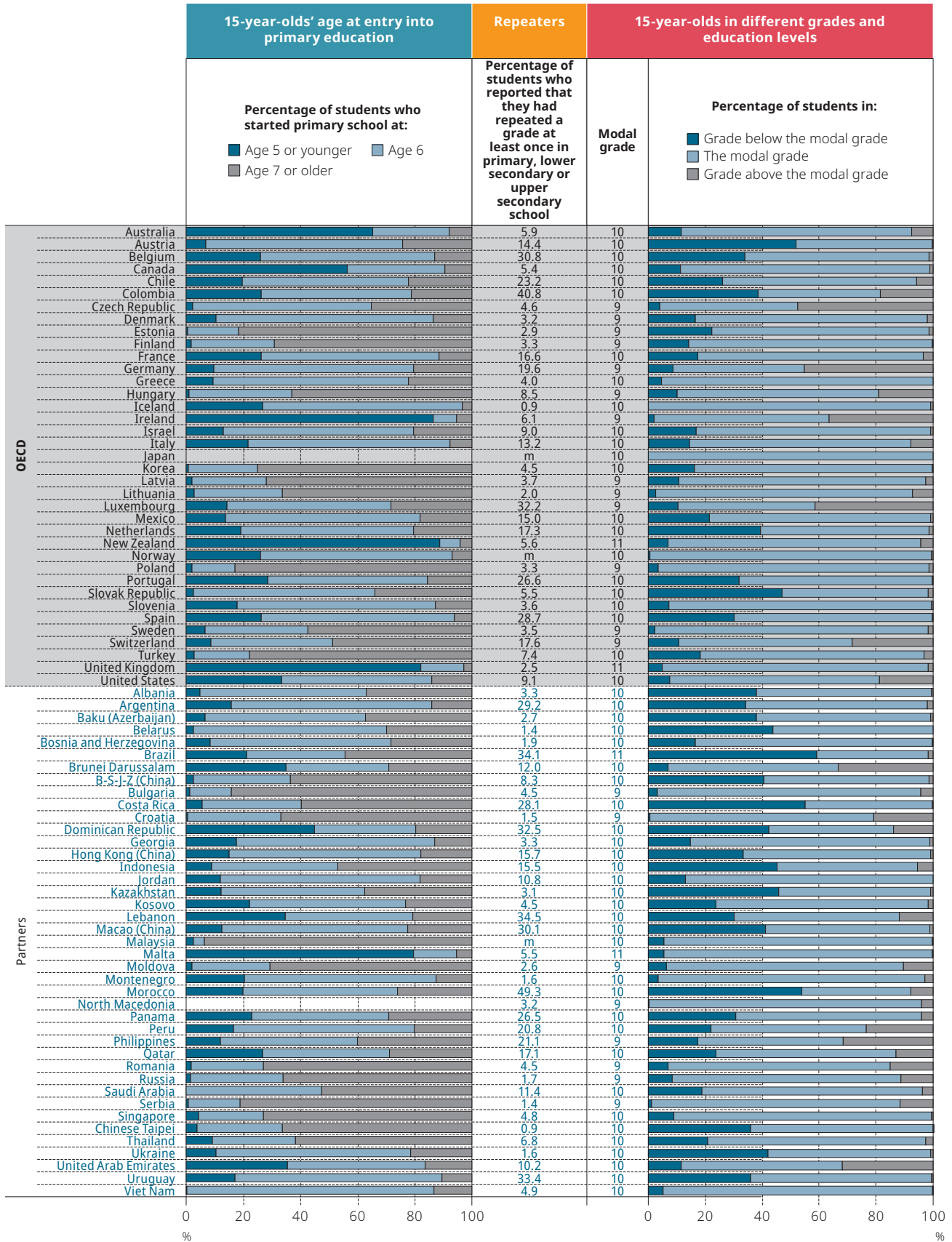
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ENTRY INTO PRIMARY EDUCATION AND GRADE LEVEL AT AGE 15

PISA 2018 asked students about their age at entry into primary education. These data reflect the actual age at entry into primary school as reported by students, not the theoretical age at entry into this level of education as defined by law and regulations, which was discussed in a previous section of this chapter. On average across OECD countries, 48% of the students who participated in PISA 2018 reported that they had started primary school at age 6, while another 26% started at age 7, and 22% started before they were 6 (Table V.B1.2.6).

Some variation in the typical age at entry into primary education was observed across countries. In Australia, Ireland, Malta, New Zealand and the United Kingdom, at least six out of ten students had started primary school at age five or earlier (Figure V.2.5). As shown in Figure V.2.2, in these five countries, the theoretical age at entry into primary education is 5 years old. In 38 PISA-participating countries/economies, at least half of students had started primary school when they were 6 years old. In 20 countries/economies, a majority of students had started primary education when they were 7 years old, while in Bulgaria, Estonia, Malaysia, Poland, Serbia and Singapore, at least seven out of ten students had started primary education when they were seven or older.

Figure V.2.5 Age at entry into primary school, grade repetition and grade level



Source: OECD, PISA 2018 Database, Table V.B1.2.6, Table V.B1.2.7 and Table V.B1.2.9.

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In many countries, 15-year-old students in 2018 had started primary school later than their counterparts in 2015 had. In 39 countries and economies, the share of students who reported that they had started primary school at age 4 or younger shrank between 2015 and 2018, and by more than 5 percentage points in 9 countries (Canada, the Dominican Republic, Lebanon, Malta, the Netherlands, Qatar, Spain, the United Arab Emirates and the United Kingdom) (Table V.B1.2.6). By contrast, the share of students who had started primary school at age 5 increased in 21 countries and economies (this share decreased in 6 countries and economies), and the share of students who had started primary school at age 7 increased in 25 countries and economies (this share decreased in 8 countries/economies).

In 54 countries and economies, the modal grade of enrolment of 15-year-olds was grade 10, whereas in another 21 countries and economies the modal grade was grade 9. The only exceptions were Brazil, Malta, New Zealand and the United Kingdom, where the modal grade was grade 11. The modal grade of a school system is the result or consequence of other vertical stratification policies and practices, such as the age at which children start school. The modal grade is also partly a result of PISA's specific sampling design (i.e. how PISA defines its target population and how individual countries determined their testing windows⁵).

On average across OECD countries, in PISA 2018, 76% of students were enrolled in the modal grade in their respective country or economy, 16% were enrolled below that modal grade and 8% of students were enrolled above that modal grade. In Greece, Iceland, Japan, North Macedonia, Norway, Poland, Sweden and Viet Nam, at least 95% of students were enrolled in the modal grade. In these eight countries, grade repetition is rare and thus most students move up through schooling at the same pace.

The share of students in grades below the modal grade decreased by five percentage points between 2003 and 2018 on average across OECD countries. This share decreased in 17 countries and economies, and by 25 percentage points or more in the Czech Republic, Mexico and the United Kingdom. It increased in ten countries and economies, and by ten percentage points or more in Brazil, Indonesia, Korea and Turkey.

GRADE REPETITION

Grade repetition is the practice of requiring students to remain in the same grade level for an additional year, instead of promoting them to the next grade along with their peers of the same age. Students are typically required to repeat a grade when they do not perform well academically. The intended purpose of grade repetition is to give students a “second chance” to master the knowledge and skills appropriate for their grade level. However, evidence of the benefits of grade repetition is mixed (Allen et al., 2009^[19]). Short-term gains in test scores tend to disappear a few years after repetition (Alet, 2014^[20]). Students who had repeated a grade tend to perform less well in school and hold more negative attitudes towards school at age 15 than students who had not repeated a grade in primary or in secondary education (Ikeda and García, 2014^[21]; Jimerson, Anderson and Whipple, 2002^[22]). In addition, students who had repeated a grade are more likely to drop out of high school (Manacorda, 2008^[23]; Jimerson, Anderson and Whipple, 2002^[22]; Stearns et al., 2007^[24]).

On average across OECD countries in 2018, 11% of students reported that they had repeated a grade at least once in either primary or secondary school. In 34 countries and economies, 5% of students or less had repeated a grade. In 14 countries, more than 25% of students had repeated a grade; in Colombia, about 40% of students had repeated a grade, and in Morocco, around 50% of students had done so.

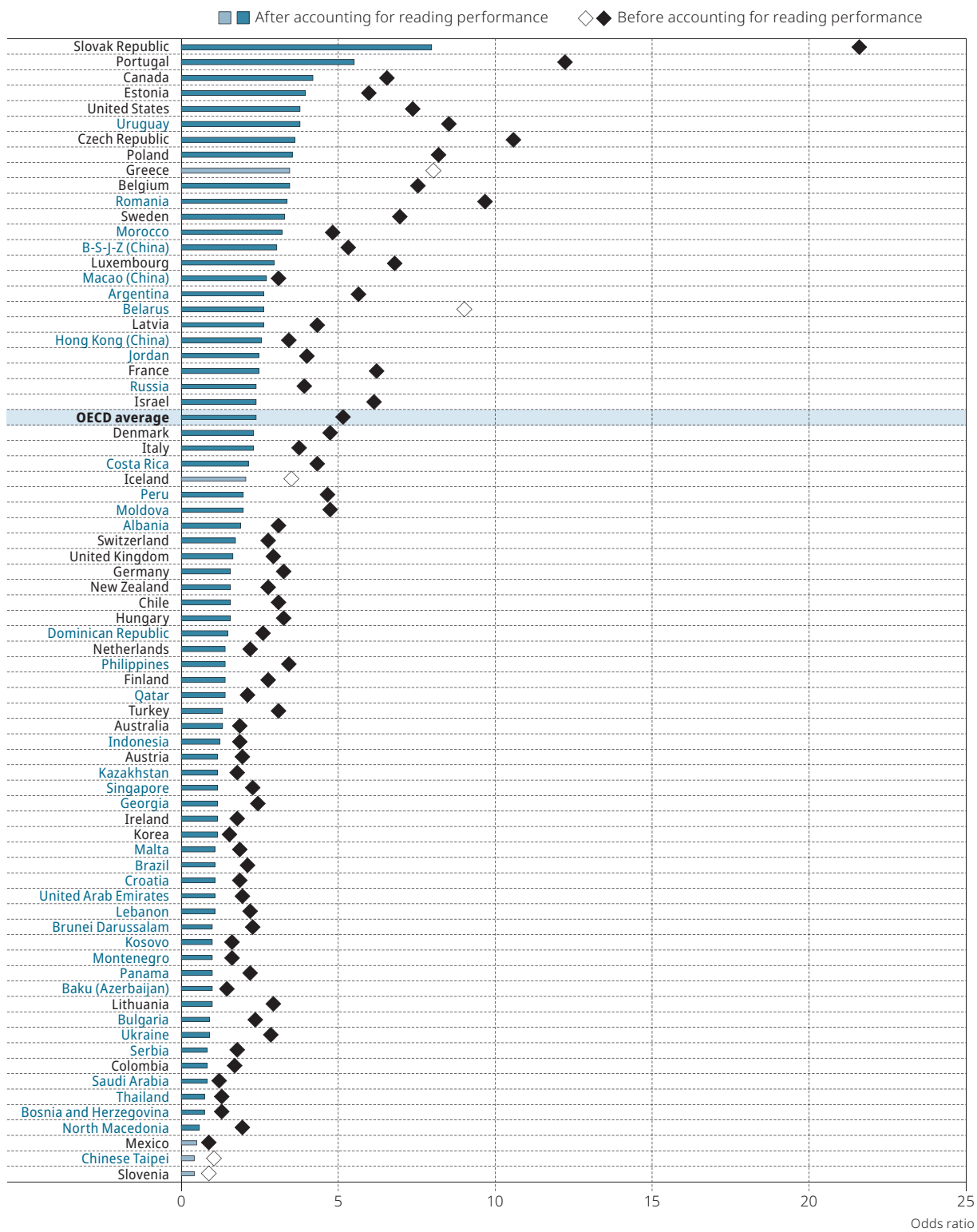
The incidence of grade repetition decreased between 2003 and 2018 in 14 out of 36 countries and economies for which there are comparable data. On average across OECD countries, the percentage of students who reported that they had repeated a grade at least once decreased by three percentage points during the period; it decreased by more than 10 percentage points in France, Macao (China), Mexico, the Netherlands and Turkey. By contrast, the incidence of grade repetition increased between 2003 and 2018 in Austria, the Czech Republic, Iceland, Korea, New Zealand, the Slovak Republic and Thailand.

The incidence of grade repetition also decreased between 2015 and 2018 in 15 out of 65 countries and economies for which there are comparable data. It increased in six countries and economies, most noticeably in Lebanon, where the share of students who had repeated a grade increased by eight percentage points. The incidence of grade repetition did not change by a statistically significant magnitude in 44 countries and economies between 2015 and 2018.

In almost all countries and economies that participated in PISA 2018, students in socio-economically disadvantaged schools were more likely to have repeated a grade than students in advantaged schools. The only exceptions were Baku (Azerbaijan), New Zealand, Chinese Taipei and Viet Nam, where no disparities in grade repetition related to schools' socio-economic profile were observed. On average across OECD countries, 20% of students in disadvantaged schools had repeated a grade at least once, compared to only 5% of students in advantaged schools (Table V.B1.2.10). In Argentina, Belgium, France, Lebanon, Morocco and Uruguay, the share of students in disadvantaged schools who had repeated a grade was at least 40 percentage points larger than the share of students in advantaged schools who had done so.

Figure V.2.6 Grade repetition, socio-economic status and reading performance

Increased likelihood of having repeated a grade amongst disadvantaged students, relative to advantaged students, before and after accounting for reading performance



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

Note: Statistically significant odds ratios are shown in darker tones (see Annex A3).

Countries and economies are ranked in descending order of the increased likelihood of having repeated a grade amongst disadvantaged students, after accounting for reading performance.

Source: OECD, PISA 2018 Database, Table V.B1.2.11.

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Furthermore, in 38 countries and economies, disadvantaged students were more likely than advantaged students to have repeated a grade, even when the two groups scored similarly in reading (Figure V.2.6). On average across OECD countries, a disadvantaged student was more than twice as likely as an advantaged student to have repeated a grade at least once, even if the students scored similarly in the PISA reading test (Table V.B1.2.11).⁶ This suggests that factors other than academic performance (e.g. student well-being, misbehaviour, illness, attendance, etc.) are considered when teachers assign marks or when schools make decisions about whether a student should repeat a grade.

On average across OECD countries, students who had repeated a grade at least once in primary or secondary school scored around 93 points lower than students who had not repeated a grade (Table V.B1.2.10). After accounting for students' and schools' socio-economic profile, students who had repeated a grade scored around 67 points lower than students who had not repeated a grade.

HOW VERTICAL STRATIFICATION IS RELATED TO DIFFERENCES IN PERFORMANCE AND EQUITY IN EDUCATION ACROSS COUNTRIES/ECONOMIES (SYSTEM-LEVEL ANALYSIS)

This section examines whether measures of vertical stratification are related to education outcomes at the system level. Two education outcomes are considered: mean performance in reading and equity in reading performance. As in previous PISA reports, equity in reading performance is measured by the percentage of variation in reading performance accounted for by differences in students' socio-economic status; the smaller the variation in performance explained by socio-economic status, the greater the equity in performance (OECD, 2019^[25]; OECD, 2018^[26]).

Figure V.2.7 shows system-level correlation coefficients between measures of vertical stratification on the one hand, and reading performance and equity in reading performance on the other. Correlational analyses were conducted separately for OECD countries and for all countries and economies that participated in PISA 2018. In addition, correlations were computed before and after accounting for per capita GDP, to account for the level of economic development of a country/economy.

At the system level, grade repetition was negatively related to reading performance. This is consistent with findings at the student level. Countries and economies with smaller shares of students who had repeated a grade generally showed higher mean performance in PISA. As shown in Figure V.2.7, the percentage of students who had repeated a grade at least once was negatively correlated with mean performance in reading, even after accounting for per capita GDP, across OECD countries, and across all countries and economies. Differences in grade repetition accounted for about 24% of the variation in mean reading performance across OECD countries and for about 10% of the variation across all countries and economies. (Figure V.2.8).⁷

In addition, countries and economies with smaller shares of students who had repeated a grade generally showed greater equity in education. As shown in Figure V.2.7, the percentage of students who had repeated a grade at least once was negatively correlated with equity in reading performance, even after accounting for per capita GDP, across OECD countries, and across all countries and economies. Differences in grade repetition accounted for about 26% of the variation in equity in reading performance across OECD countries, and for about 7% of the variation across all countries and economies (Figure V.2.9).^{8,9}

At the system level, across all participating countries and economies, education systems where more students had attended pre-primary education for three years or more showed higher mean performance in reading, even after accounting for per capita GDP (Figure V.2.7). Differences in the percentage of students who had attended pre-primary education for three years or more accounted for about 23% of the variation in mean reading performance across all countries and economies (Figure V.2.10). However, PISA 2018 results also showed that in countries and economies where more students had attended pre-primary education for three years or more, average performance was higher but students' socio-economic profile was more strongly related to their performance at the age of 15. These relationships were observed across all countries and economies, but not across OECD countries.

Changes between PISA 2015 and 2018 in the percentage of students who had attended pre-primary school for two years were positively correlated with changes in mean reading performance over the same period, across OECD countries, and across all countries and economies (Figure V.2.11). Changes in the percentage of students who had attended pre-primary school for two years accounted for 22% of the variation in changes of mean reading performance across all countries and economies.

Countries/economies with a larger share of students in the modal grade also showed greater equity in student performance. The system-level correlations between the percentage of students in the modal grade and equity in reading performance were statistically significant, after accounting for per capita GDP, across OECD countries, and across all countries and economies^{10,11} (Figure V.2.5). As shown in Figure V.2.12, almost 40% of the differences in equity in reading performance across OECD countries could be accounted for by differences in the percentage of students in the modal grade.

Figure V.2.7 [1/2] **Selected measures of vertical stratification, student performance and equity**

		OECD countries			
		Mean reading score		Equity in reading ¹	
		Before accounting for per capita GDP	After accounting for per capita GDP	Before accounting for per capita GDP	After accounting for per capita GDP
Pre-primary education	Had not attended pre-primary or attended less than a year				
	Had attended pre-primary at least 1 year but less than 2				
	Had attended pre-primary at least 2 years but less than 3				
	Had attended pre-primary 3 years or more				
Primary education	4 years old or younger when started ISCED 1	<i>0.29</i>			
	5 years old when started ISCED 1				
	6 years old when started ISCED 1	-0.48	-0.54	-0.33	-0.33
	7 years old when started ISCED 1				
	8 years old when started ISCED 1				
	9 years old or older when started ISCED 1				
	Age when started ISCED 1				
Grade repetition	Never repeated a grade at ISCED 1	0.40	0.51	0.50	0.49
	Repeated a grade once at ISCED 1	-0.38	-0.53	-0.53	-0.52
	Repeated a grade twice or more at ISCED 1	-0.39	-0.35		
	Never repeated a grade at ISCED 2	0.48	0.53	0.44	0.44
	Repeated a grade once at ISCED 2	-0.45	-0.54	-0.49	-0.49
	Repeated a grade twice or more at ISCED 2	-0.51	-0.44		
	Never repeated a grade at ISCED 3				
	Repeated a grade once at ISCED 3				
	Repeated a grade twice or more at ISCED 3				
	Repeated a grade at least once at ISCED 1, ISCED 2 or ISCED 3	-0.49	-0.57	-0.51	-0.51
Grade level	Grade below the modal grade	-0.38	-0.32	-0.28	-0.29
	At modal grade	0.33	0.42	0.63	0.63
	Grade above the modal grade			-0.50	-0.54
	Percentage of students enrolled in ISCED level 3				

1. The percentage of variance in student performance explained by PISA index of economic, social and cultural status was used as measure of inequity in performance. In a first step, the correlation coefficients between measures of vertical stratification and inequity were computed. In a second step, the sign of the correlation coefficients was reversed (i.e. multiplied by -1) to simplify reporting (i.e. report correlation with equity instead of with inequity).

Notes: Only statistically significant coefficients are shown. Values that are statistically significant at the 10% level ($p < 0.10$) are in italics. All other values are statistically significant at the 5% level ($p < 0.05$).

Correlation coefficients range from -1.00 (i.e. a perfect negative linear association) to +1.00 (i.e. a perfect positive linear association). When a correlation coefficient is 0, there is no linear relationship between the two measures.

Source: OECD, PISA 2018 Database, Table V.B1.2.14.


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Figure V.2.7 [2/2] Selected measures of vertical stratification, student performance and equity

		All countries and economies			
		Mean reading score		Equity in reading ¹	
		Before accounting for per capita GDP	After accounting for per capita GDP	Before accounting for per capita GDP	After accounting for per capita GDP
Pre-primary education	Had not attended pre-primary or attended less than a year	-0.47	-0.40	0.33	0.32
	Had attended pre-primary at least 1 year but less than 2	-0.37	-0.28		
	Had attended pre-primary at least 2 years but less than 3		-0.23		
	Had attended pre-primary 3 years or more	0.48	0.46		
Primary education	4 years old or younger when started ISCED 1				
	5 years old when started ISCED 1				
	6 years old when started ISCED 1				
	7 years old when started ISCED 1				
	8 years old when started ISCED 1	<i>0.21</i>			
	9 years old or older when started ISCED 1	-0.37	-0.38		
	Age when started ISCED 1				
Grade repetition	Never repeated a grade at ISCED 1	0.36	0.45	0.27	0.26
	Repeated a grade once at ISCED 1	-0.32	-0.43	-0.30	-0.29
	Repeated a grade twice or more at ISCED 1	-0.45	-0.44		
	Never repeated a grade at ISCED 2	0.38	0.42		
	Repeated a grade once at ISCED 2	-0.35	-0.40		
	Repeated a grade twice or more at ISCED 2	-0.44	-0.41		
	Never repeated a grade at ISCED 3		<i>0.22</i>		
	Repeated a grade once at ISCED 3				
	Repeated a grade twice or more at ISCED 3	-0.33	-0.37		
Repeated a grade at least once at ISCED 1, ISCED 2 or ISCED 3	-0.32	-0.40	-0.26	-0.25	
Grade level	Grade below the modal grade	-0.27	-0.24		
	At modal grade	0.29	0.36	0.30	0.32
	Grade above the modal grade		-0.21	-0.37	-0.42
	Percentage of students enrolled in ISCED level 3				

1. The percentage of variance in student performance explained by PISA index of economic, social and cultural status was used as measure of inequity in performance. In a first step, the correlation coefficients between measures of vertical stratification and inequity were computed. In a second step, the sign of the correlation coefficients was reversed (i.e. multiplied by -1) to simplify reporting (i.e. report correlation with equity instead of with inequity).

Notes: Only statistically significant coefficients are shown. Values that are statistically significant at the 10% level ($p < 0.10$) are in italics. All other values are statistically significant at the 5% level ($p < 0.05$).

Correlation coefficients range from -1.00 (i.e. a perfect negative linear association) to +1.00 (i.e. a perfect positive linear association). When a correlation coefficient is 0, there is no linear relationship between the two measures.

Source: OECD, PISA 2018 Database, Table V.B1.2.14.


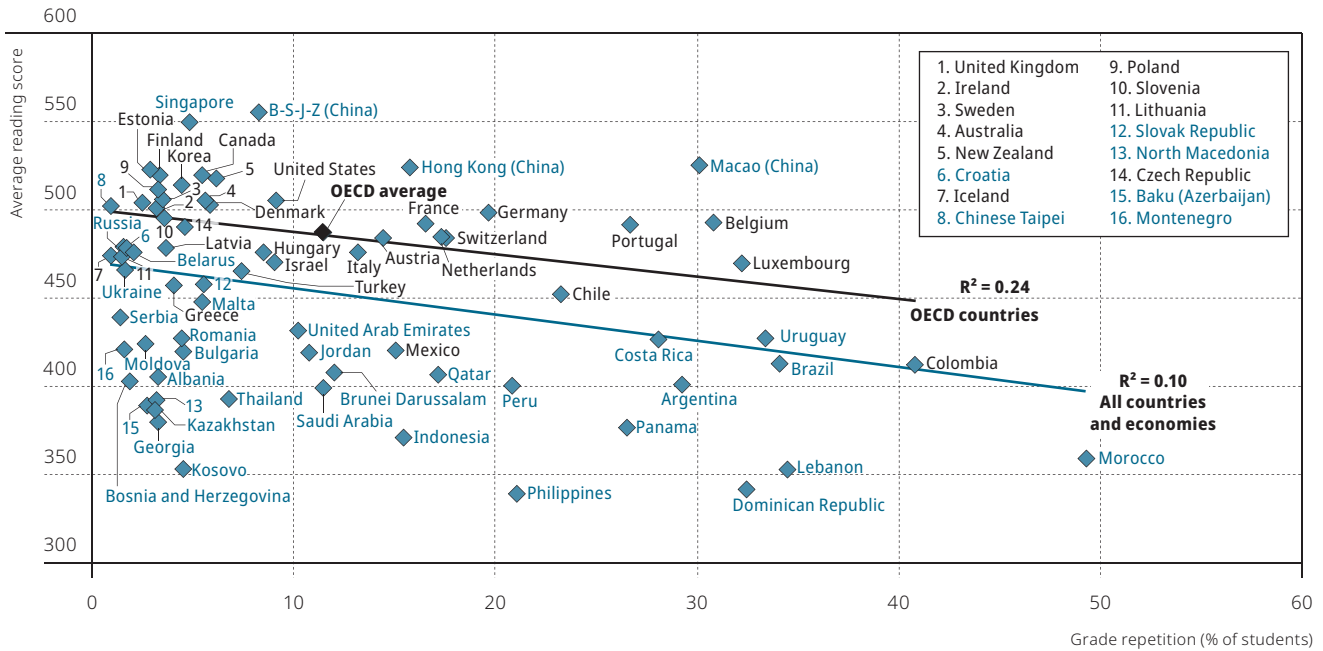
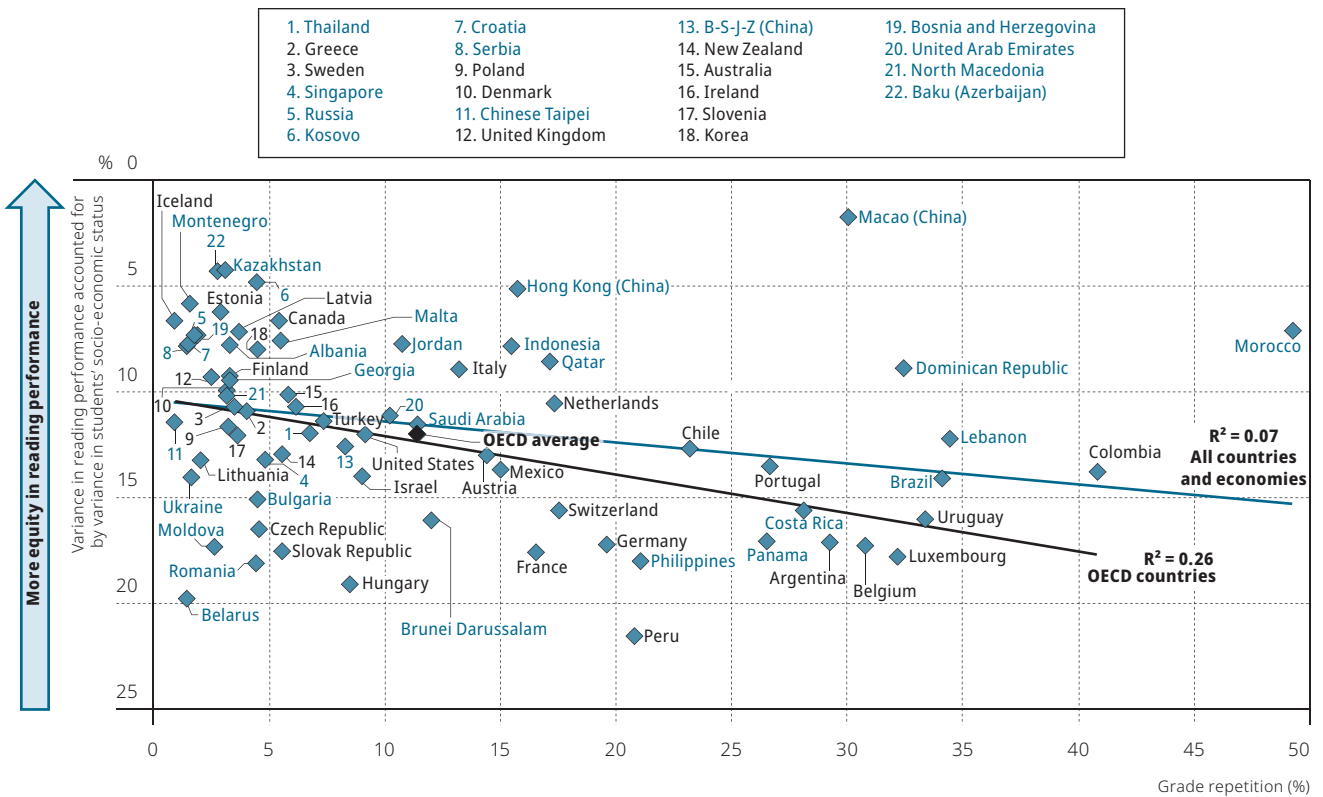
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Figure V.2.8 Grade repetition and reading performance



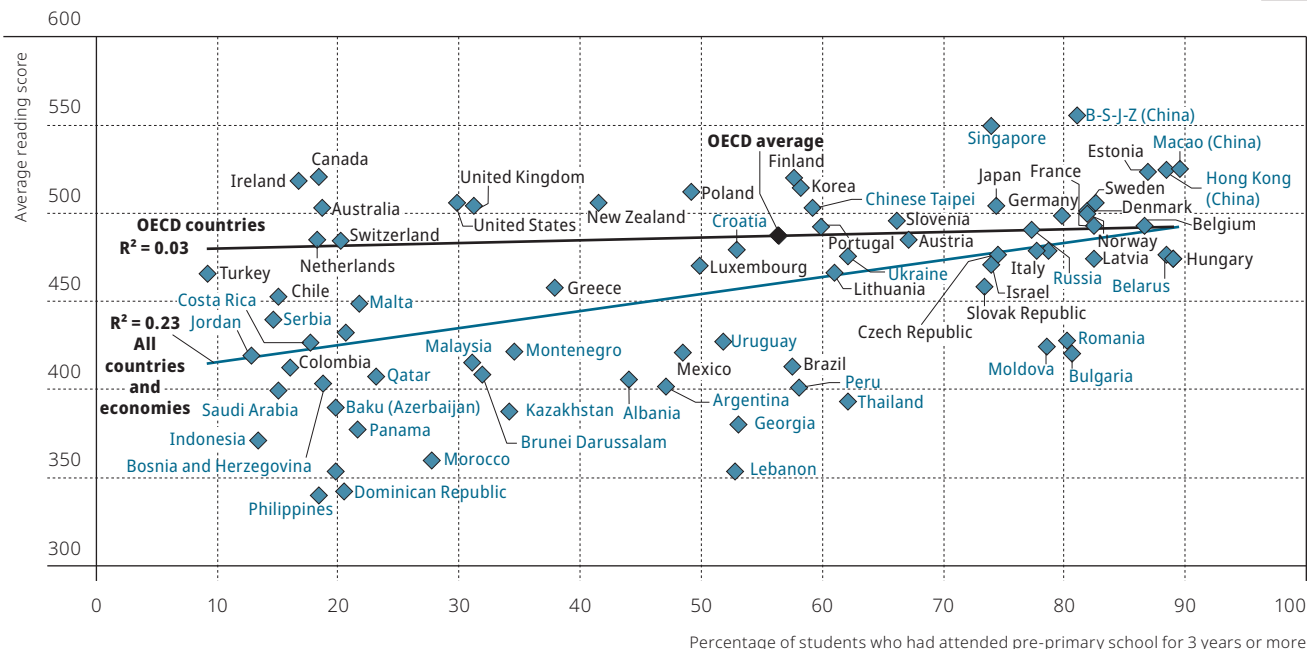
Source: OECD, PISA 2018 Database, Tables I.B1.4 and V.B1.2.10.
 StatLink <https://doi.org/10.1787/888934130645>

Figure V.2.9 Grade repetition and equity in reading performance



Source: OECD, PISA 2018 Database, Tables II.B1.2.3 and V.B1.2.10.
 StatLink <https://doi.org/10.1787/888934130664>

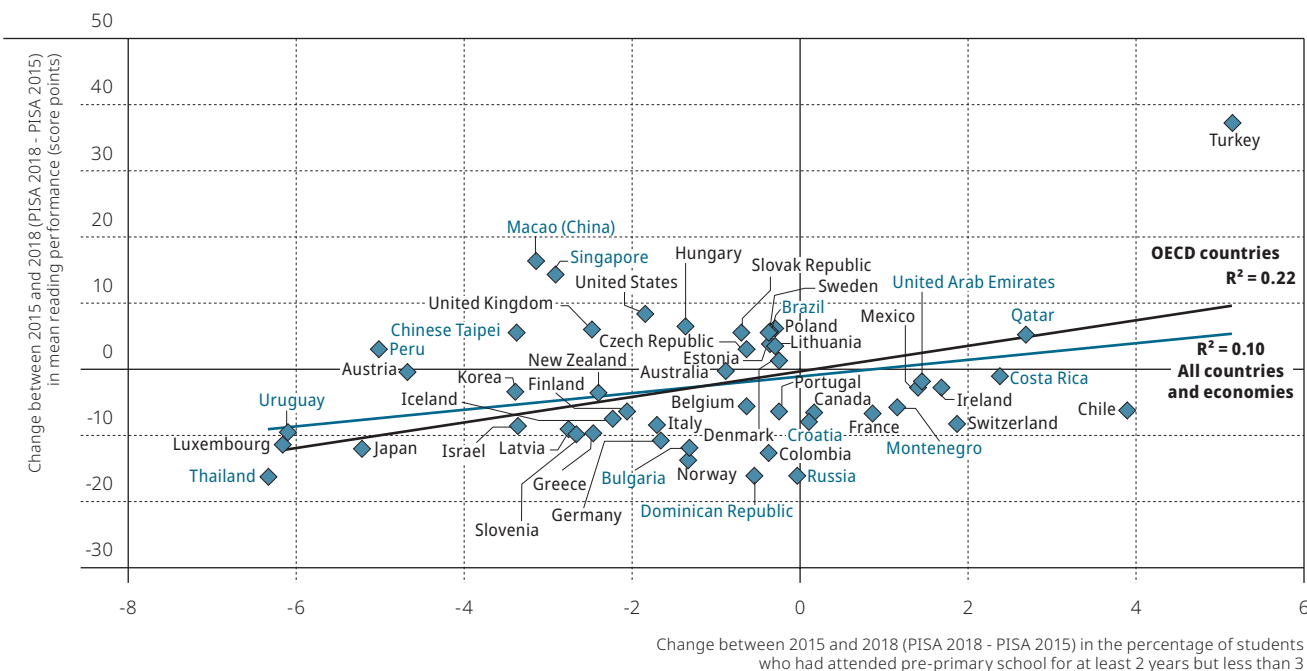
Figure V.2.10 Pre-primary education and student performance



Source: OECD, PISA 2018 Database, Tables I.B1.4 and V.B1.2.1.

StatLink <https://doi.org/10.1787/888934130683>

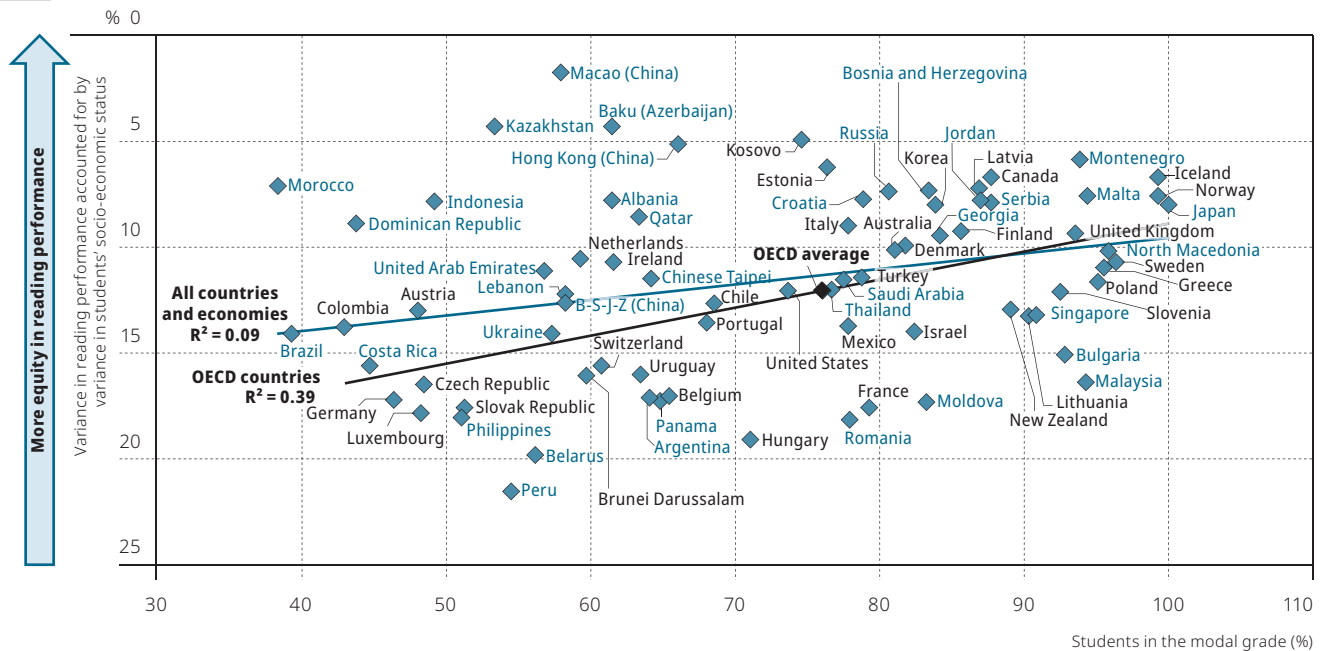
Figure V.2.11 Changes between 2015 and 2018 in pre-primary education and reading performance



Source: OECD, PISA 2018 Database, Tables I.B1.10 and V.B1.2.1.

StatLink <https://doi.org/10.1787/888934130702>

Figure V.2.12 Share of students in the modal grade and equity in student performance



Source: OECD, PISA 2018 Database, Tables II.B1.2.3 and V.B1.2.7.
 StatLink <https://doi.org/10.1787/888934130721>

Box V.2.1. **Stratification policies, growth mindset and equity in education**

Students who believe that their intelligence is something they can change (i.e. who endorse a growth mindset) scored higher in reading than students who do not believe so (OECD, 2019_[27]). However, socio-economically advantaged students are more likely than disadvantaged students to endorse a growth mindset. As a result, a growth mindset can be a factor that reinforces socio-economic disparities in student achievement. How can schools and teachers encourage all students, including disadvantaged students, to endorse a growth mindset? Certain stratification policies that are related to growth mindset and to inequities in education, such as grade repetition and early tracking, can have an impact.

Growth mindset, socio-economic status and reading performance

A growth mindset, or incremental theory of intelligence, is the belief that someone's ability and intelligence can develop over time. By contrast, a fixed mindset is the belief that someone is born with a certain degree of ability and intelligence that is nearly unaltered by experience (Caniëls, Semeijn and Renders, 2018_[28]; Dweck, 2006_[29]).

For the first time in 2018, PISA measured growth mindset by asking students if they agreed or disagreed with the statement, "Your intelligence is something about you that you can't change very much". On average across OECD countries, some 60% of students disagreed or strongly disagreed with the statement, this is, they endorsed a growth mindset. However, the percentage of students who endorsed a growth mindset varied widely across countries.

PISA 2018 Results (Volume III) (OECD, 2019_[27]) examines the relationship between holding a growth mindset, a student's socio-economic status and reading performance. Amongst the key findings:

- Socio-economically advantaged students were more likely than disadvantaged students to hold a growth mindset. On average across OECD countries, the percentage of students who hold a growth mindset was 12 percentage points higher amongst advantaged students than amongst disadvantaged student.

- Students who endorse a growth mindset scored better in reading, on average, than students who do not endorse a growth mindset. On average across OECD countries, students who hold a growth mindset scored 32 points higher in reading than students who do not hold a growth mindset, after accounting for the socio-economic profile of students and schools.
- The relationship between endorsing a growth mindset and reading performance was generally stronger amongst socio-economically disadvantaged students than amongst advantaged students.
- Holding a growth mindset was positively associated with students' motivation to master tasks, general self-efficacy, learning goals and perceiving the value of schooling; it was negatively associated with their fear of failure.

These results suggest that a growth mindset is an attitude that contributes to student learning, especially amongst disadvantaged students. However, because it is more prevalent amongst advantaged students, a growth mindset may be a factor that reinforces socio-economic disparities in student achievement. Schools and teachers might help enhance equity in education if they find ways to encourage all students, not just advantaged and high-performing students, to believe that they can develop their intelligence over time. Stratification policies could be adapted to this end.

Stratification policies and practices, growth mindset and equity in education

Grade repetition – a key vertical stratification policy – is negatively related to growth mindset. In 46 out of 76 countries and economies, students who had not repeated a grade in primary or secondary school were more likely than students who had repeated a grade to hold a growth mindset (in 3 countries/economies, they were less likely to hold a growth mindset) (Figure V.2.13). After accounting for students' and schools' socio-economic profile, in 38 countries and economies students who had not repeated a grade were more likely to endorse a growth mindset (in 4 countries/economies, those students were less likely to endorse a growth mindset). On average across OECD countries, students who had not repeated a grade were almost 50% more likely to endorse a growth mindset than students who had repeated a grade (odds ratio = 1.49), after accounting for students' and schools' socio-economic profile.

Similarly, tracking between schools and programmes of general and vocational orientation – a key measure of horizontal stratification policies – is related to holding a growth mindset. In 28 out of 51 countries/economies with valid data, students enrolled in a general/academic school or programme at age 15 were more likely than students in vocational schools or programmes to endorse a growth mindset (in 4 countries/economies, those students were less likely to endorse a growth mindset). After accounting for students' and schools' socio-economic profile, in 15 countries and economies, students enrolled in a general/academic school or programme were more likely than students in vocational schools/programmes to endorse a growth mindset (in 5 countries/economies, they were less likely to endorse a growth mindset). On average across OECD countries, students enrolled in a general/academic school or programme were about 12% more likely to endorse a growth mindset than students in vocational schools/programmes (odds ratio = 1.12), after accounting for students' and schools' socio-economic profile.

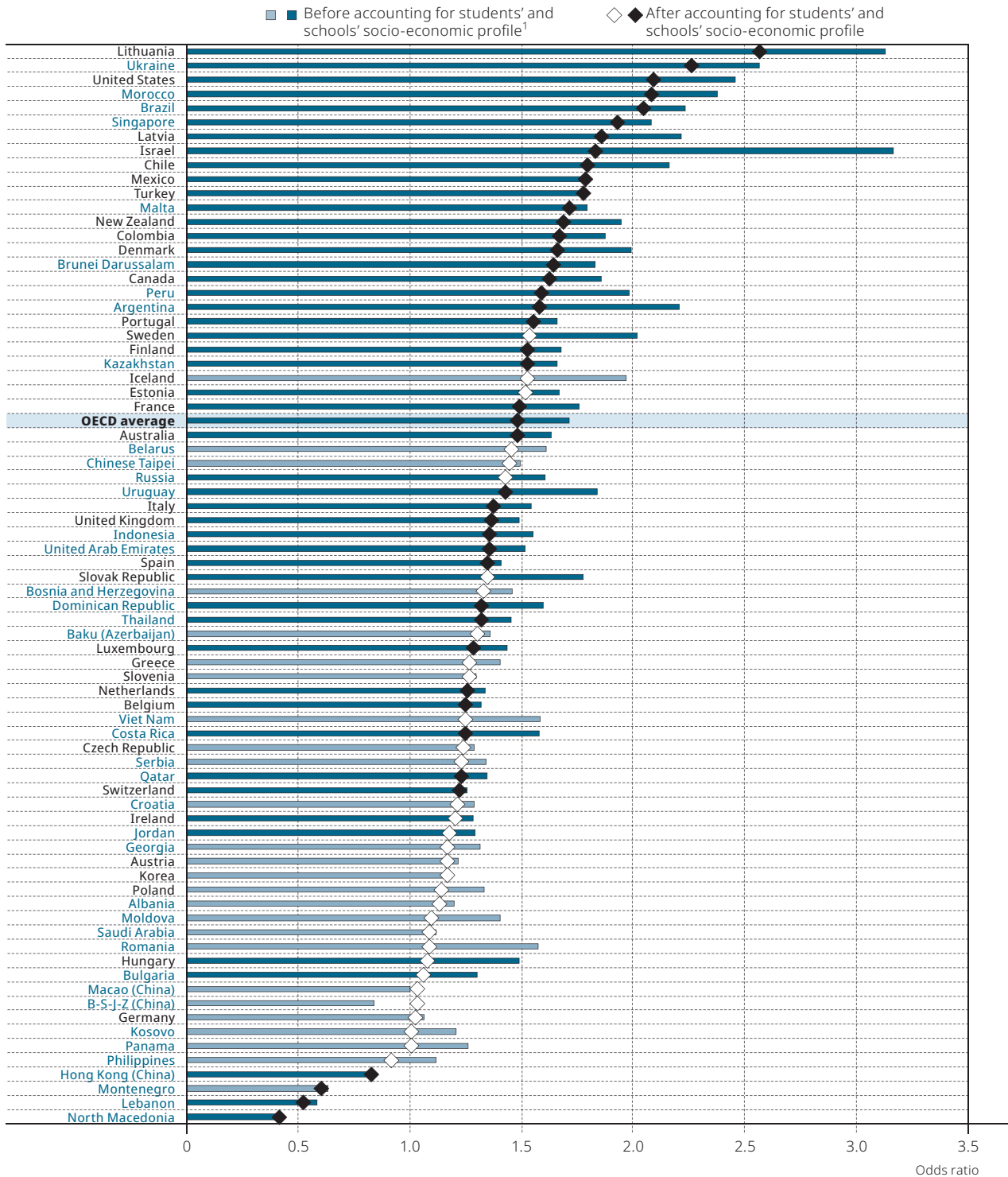
At the system level, grade repetition and tracking were related to equity in reading performance in PISA 2018. Even after accounting for per capita GDP, equity in reading performance was generally greater in countries and economies with a lower percentage of students who had repeated a grade (Figure V.2.9), and with a higher percentage of students enrolled in general programmes (Figure V.3.9).

These findings suggest that encouraging students who had repeated a grade, and students who are enrolled in vocational schools and programmes, to believe that they can develop their intelligence over time has the potential to reduce socio-economic disparities in student achievement. At the same time, reducing rates of grade repetition and delaying tracking between schools might result in more students adopting a growth mindset and greater equity in student performance.

...

Figure V.2.13 **Growth mindset and grade repetition**

Increased likelihood of disagreeing or strongly disagreeing that “your intelligence is something about you that you can’t change very much”, amongst students who had not repeated a grade in primary or secondary school (reference: students who had repeated a grade at least once).



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

Note: Statistically significant odds ratio are shown in darker tones (see Annex A3).

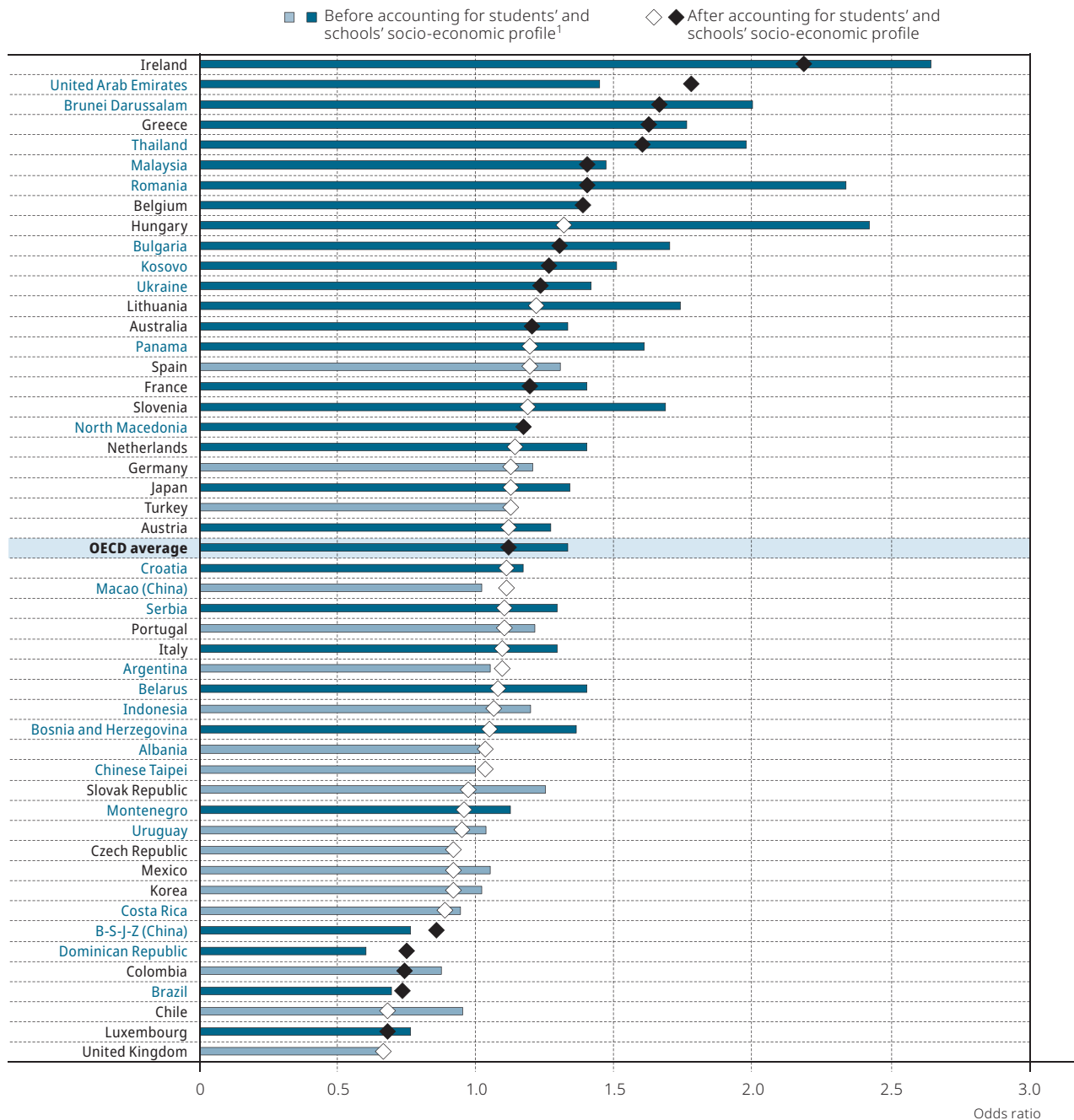
Countries and economies are ranked in descending order of the increased likelihood of disagreeing or strongly disagreeing that “your intelligence is something about you that you can’t change very much”, after accounting for students’ and schools’ socio-economic profile.

Source: OECD, PISA 2018 Database, Table V.B1.2.17.

StatLink <https://doi.org/10.1787/888934130740>

Figure V.2.14 **Growth mindset and programme orientation**

Increased likelihood of disagreeing or strongly disagreeing that “your intelligence is something about you that you can’t change very much”, amongst students who were enrolled in a general programme (reference: students enrolled in a vocational or pre-vocational programme).



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

Note: Statistically significant odds ratio are shown in darker tones (see Annex A3).

Countries and economies are ranked in descending order of the increased likelihood of disagreeing or strongly disagreeing that “your intelligence is something about you that you can’t change very much”, after accounting for students’ and schools’ socio-economic profile.

Source: OECD, PISA 2018 Database, Table V.B1.2.17.

StatLink <https://doi.org/10.1787/888934130759>

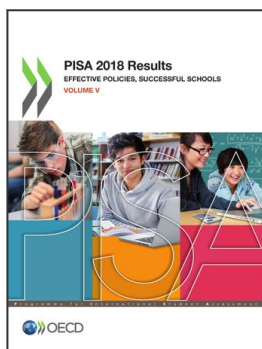
Notes

1. In this chapter, the term “schooling” is used to refer to the following four levels of education together: ISCED level 0 (early childhood education), ISCED level 1 (primary education), ISCED level 2 (lower secondary education) and ISCED 3 (upper secondary education).
2. In this chapter, a student who “had not attended” pre-primary education is a student who had not attended pre-primary education at all or had attended pre-primary education for less than one year. Attending for “one year” means that the student had attended pre-primary education for at least one year, but less than two; attending for “two years” means the student had attended for at least two years, but less than three. Attending for “three years” means the student had attended pre-primary education for at least three years.
3. In this chapter, the term “pre-primary education” is used to refer generically to education level ISCED 0, which includes early childhood education programmes that typically target children aged 0 to 5. However, in some countries, the national version of the PISA student questionnaire translated question ST125, which asked about the age at entry into pre-primary education, as referring only to programmes that typically target children aged 3 to 5 (e.g. kindergarten). This was, for example, the case in Denmark.
4. For the sake of comparability between countries, all school-level analyses of student performance in this chapter (and in following chapters) were restricted to schools with the modal ISCED level for 15-year-old students. The “modal ISCED level” is defined here as the level attended by at least one-third of the PISA sample. As PISA students are sampled to represent all 15-year-old students, whatever type of schools they are enrolled in, they may not be representative of their schools. Restricting the sampling to schools with the modal ISCED level for 15-year-old students ensured that the characteristics of students sampled for PISA represent the profile of the typical student attending the school. In Albania, Argentina, Baku (Azerbaijan), Belarus, Beijing, Shanghai, Jiangsu and Zhejiang (China), Colombia, Costa Rica, the Czech Republic, the Dominican Republic, Indonesia, Ireland, Kazakhstan, Luxembourg, Macao (China), Morocco, the Slovak Republic, Chinese Taipei and Uruguay, both lower secondary (ISCED level 2) and upper secondary (ISCED level 3) schools met this definition. In all other countries, analyses were restricted to either lower secondary or upper secondary schools. In several countries, lower and upper secondary education is provided in the same school. As the restriction was made at the school level, some students from a grade other than the modal grade in the country may also have been used in the analysis. Table V.B1.2.13 shows differences in key characteristics between students in the modal grade and those not in the modal grade in each country.
5. In some countries that participated in PISA 2018, the choice of a particular testing date for PISA resulted in the PISA cohort encompassing two distinct age-at-starting-school cohorts, as determined by the school start date and the cut-off date for determining age eligibility. Such a situation was observed in around half of the 25 OECD countries with available data on school entry regulations, namely Austria, Chile, the Czech Republic, Estonia, Finland, Germany, Hungary, Ireland, Korea, Luxembourg, Portugal, the Slovak Republic and Turkey. By contrast, in Denmark, France, Iceland, Italy, Japan, Mexico, the Netherlands, Norway, Poland, Spain, Sweden and the United Kingdom, the PISA sample was composed of only one grade cohort. Students enrolled in a higher grade may have learned more complex notions than students in lower grades, and thus attained higher performance in PISA (Givord, 2020^[44]).
6. Caution is advised in interpreting the results. Students were 15 years old when they sat the PISA reading assessment, thus results may not perfectly reflect the performance of a student who had repeated a grade.
7. The correlation between grade repetition and mean reading performance was partly driven by Colombia and Morocco, two countries with a high percentage of students who had repeated a grade and comparatively low mean reading performance. After excluding these two outliers with the highest incidence of grade repetition (i.e. percentages equal to or higher than 40%), the correlation weakened but remained statistically significant across OECD countries (r coefficient = -0.30; partial r after accounting for per capita GDP = -0.43), and across all countries and economies (r coefficient = -0.25; partial r after accounting for per capita GDP = -0.38).
8. The correlation between grade repetition and equity in reading performance was not driven by outliers. After excluding the two countries (Colombia and Morocco) with the highest incidence of grade repetition (i.e. percentages equal to or higher than 40%), the negative correlation between grade repetition and equity in reading performance became even stronger across OECD countries (r coefficient = -0.56; partial r after accounting for per capita GDP = -0.55), and across all countries and economies (r coefficient = -0.34; partial r after accounting for per capita GDP = -0.34).
9. After excluding low-performing countries/economies (i.e. mean performance in reading lower than 413 score points), the strength of the association between grade repetition and equity in reading performance strengthened slightly across OECD countries (after exclusion, $R^2 = 0.31$), whereas across all countries/economies, the association remained unaltered (after exclusion, $R^2 = 0.07$).
10. After excluding countries where less than 45% of students were in the modal grade (i.e. Brazil, Colombia, the Dominican Republic and Morocco), the correlation between the percentage of students in the modal grade and equity in reading performance did not change across OECD countries (r coefficient = 0.64; partial r after accounting for per capita GDP = 0.65), but it became somewhat stronger across all countries and economies (r coefficient = 0.34; partial r after accounting for per capita GDP = -0.40).
11. After excluding low-performing countries/economies (i.e. mean scores in reading lower than 413 points), the strength of the association between the percentage of students in the modal grade and equity in reading performance weakened slightly but remained statistically significant across OECD countries (after exclusion, $R^2 = 0.31$), whereas across all countries/economies, the association remained unaltered (after exclusion, $R^2 = 0.07$).

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