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Overview and policy implications

This chapter provides the context and purpose of the report, a summary of the key findings, and implications for the design and implementation of policies and practices aimed at improving equity in education.

Notes regarding Cyprus

Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognized by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

A note regarding the Russian Federation concerning Survey of Adult Skills (PIAAC) data

Readers should note that the sample for the Russian Federation does not include the population of the Moscow municipal area. The data published, therefore, do not represent the entire resident population aged 16-65 in Russia but rather the population of Russia excluding the population residing in the Moscow municipal area.

More detailed information regarding the data from the Russian Federation as well as that of other countries can be found in the Technical Report of the Survey of Adult Skills (OECD, 2016[1]).

A note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

A note regarding Lithuania

Lithuania was not an OECD member at the time of preparation of this publication. Accordingly, Lithuania is shown as a partner country and is not included in the OECD average.

This document, as well as any data and map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

EQUITY IN EDUCATION AND SOCIAL MOBILITY

Equity in education means that schools and education systems provide equal learning opportunities to all students. As a result, students of different socio-economic status, gender or immigrant and family background achieve similar levels of academic performance in key cognitive domains, such as reading, mathematics and science, and similar levels of social and emotional well-being in areas such as life satisfaction, self-confidence and social integration, during their education. Equity does not mean that all students obtain equal education outcomes, but rather that differences in students' outcomes are unrelated to their background or to economic and social circumstances over which the students have no control. Equity in education also demands that students from different backgrounds are equally likely to earn desirable post-secondary education credentials, such as university degrees, that will make it easier for them to succeed in the labour market and to realise their goals as adult members of society.

Equity is a fundamental value and guiding principle of education policy, but it is not necessarily actualised in education systems around the world. A strong normative commitment to equity was already evident in the origins of modern education in the 19th century, when early advocates of public schooling imagined that public education would become society's "great equaliser" of opportunities and conditions (Mann, 1957[2]). Today, the international community is committed to the right to education, which was first established in Article 26 of the Universal Declaration of Human Rights of 1948 and is now mandated in national legislation (UNESCO, 2000[3]). Equity in education is also a specific target of the Sustainable Development Goals set by the United Nations in 2015 (UNESCO, 2015[4]).

However, as this report shows, there is no country in the world that can yet claim to have entirely eliminated socio-economic inequalities in education. While some countries and economies that participate in PISA have managed to build education systems where socio-economic status makes less of a difference in students' learning, well-being and post-secondary educational attainment, every country can do more to improve equity in education.

Given the sharp increase in economic inequality in recent years, improving equity in education is even more urgent today than in previous decades. Income inequality among OECD countries today is at its highest level since the 1980s (OECD, 2015[5]; OECD, 2011[6]), and the economic recovery observed since 2010 has not reversed this trend (OECD, 2016[7]). As a result, countries are increasingly concerned about the potentially harmful consequences of growing economic inequality for social and educational mobility.

Indeed, much empirical research finds that countries with higher levels of income inequality tend to show lower levels of social mobility across generations, with more egalitarian Scandinavian countries having higher levels of social mobility than more unequal countries, such as Italy, the United Kingdom and the United States (Corak, 2013[8]; Blanden, 2013[9]; Solon, 2002[10]; Torche, 2015[11]). In Latin American countries, income inequality is considerably greater, and social mobility is considerably less prevalent than in most OECD countries (Torche, 2014[12]). These studies, which are based on cross-sectional measures or on historical data, are descriptive in nature and do not establish causal effects; still, the results they provide are troubling.

Research on the mechanisms through which income inequality influences social mobility reveals that greater income inequality limits education opportunities for talented yet underprivileged individuals (Lee and Lee, 2018[13]). In societies with higher income inequality, socio-economically disadvantaged youth tend to perceive smaller-than-actual returns to investing in further education (Kearney and Levine, 2016[14]). In addition, the actual increase in earnings associated with a four-year university degree (relative to a high school degree) is found to be significantly smaller for disadvantaged than for advantaged youth in such circumstances (Bartik and Hershbein, 2018[15]). Therefore, rising inequality might not only affect social mobility, but also equity in education.

Social and educational mobility are important because they indicate the equality of opportunity in a society. Social mobility refers to a change in the economic, social or cultural status of individuals between their childhood (when this status is determined, largely, by their parents' background) and their adult life (Torche, 2015[11]; Hout and DiPrete, 2006[16]). Upward social mobility occurs when students born into socio-economically disadvantaged families end up, as adults, in positions of higher status than those of their parents. Social mobility is more prevalent when the socio-economic status of parents is weakly associated with that of their adult children. Inversely, mobility is less prevalent when adults' socio-economic status is more related to their parents' position in society and less to individual talent and effort.

The principle that everybody has a fair chance at improving his or her life is at the heart of democratic political and economic institutions. In this context, schools and education systems can offer more opportunities for children and young people born into disadvantaged families to move up the socio-economic ladder. Better education outcomes correlate strongly with higher socio-economic status in adulthood (Hout, 2012[17]). In particular, the economic returns to earning a university degree are high, even as access to tertiary education is expanding (OECD, 2017[18]). As this report shows, high performance and well-being among disadvantaged 15-year-old students is a strong predictor of success in higher education and work later on.

However, the extent to which education promotes social mobility varies across countries. In contexts where success in education remains strongly linked to family background rather than to students' own talent and attitudes, education may not promote socio-economic mobility; rather, it may simply reproduce pre-existing inequalities across generations, as critical theories of education would predict (Bourdieu, 2018[19]; Bowles and Gintis, 2002[20]). In contrast, education policies that focus on equity can be among the most potent levers to reduce income disparities and foster upward social mobility over the long term (Brueckner, Dabla-Norris and Gradstein, 2014[21]).

There are some signs that countries are moving in the direction of greater equity. For example, the level of educational attainment increased worldwide during the past few decades (Barro and Lee, 2013[22]). Among OECD countries, the expansion of access to tertiary education has been particularly significant. However, participation in education continues to be related to socio-economic background (Pfeffer, 2008[23]; Hout and DiPrete, 2006[16]), and improvements in educational attainment have ambiguous effects on income inequality if not accompanied by improvements in equity in education (Lee and Lee, 2018[13]; World Bank, 2018[24]). At the same time, PISA results show that many school systems became more equitable over the past ten years and, in many countries, progress in equity was a reflection of improvements in performance among the most disadvantaged students (OECD, 2017[25]).

This report examines how successful today's schools are at counterbalancing the forces that perpetuate existing inequalities in society. It identifies the education policies and practices that promote educational equity and social mobility. The report finds that improving equity in education is consistent with, and a necessary step towards, the goal of enhancing social mobility.

KEY FINDINGS

Overall educational attainment is rising, but inequity in the completion of tertiary education persists over time within countries.

An analysis of education trends reveals that, around the world, educational attainment and access to education have greatly improved over the past half-century. Regardless of their average level of income, most countries can celebrate the fact that younger people are attaining higher levels of education than their parents and grandparents, on average. Yet, while it was hoped that such an achievement would translate into more equitable societies, this has not necessarily been the case. Disparities in educational attainment persist between adults from different countries and socio-economic backgrounds. Education has expanded faster in wealthier countries, resulting in larger absolute gaps in attainment between adults living in the richest countries (where the average number of years of schooling completed is 12) and those in the poorest countries (where the average number of years of schooling completed is 5). Less of a difference is observed between high-income and upper-middle-income countries; the gap of about two years of schooling completed between these two groups of countries has remained more or less stable over time (Figure 2.10).

Inequalities in attainment trends, related to socio-economic status, are also observed within countries. Data from the countries that participated in the Survey of Adult Skills, a product of the OECD Programme for the International Assessment of Adult Competencies (PIAAC), reveal that the probability of completing tertiary education among adults with low-educated parents (i.e. those who did not complete upper secondary education) grew from 18% to 24% between the generation born in the mid-1940s to 1950s, and that born in the mid-1970s to 1980s. For adults with highly educated parents (i.e. those who completed tertiary education), this probability grew from 61% to 69% (Figure 2.16). This suggests that equity in attainment has decreased moderately or remained stable over time, as the difference in the probability of completing tertiary education between adults with highly educated parents and those with low-educated parents grew from 43 to 45 percentage points over the past half-century, on average across the 33 countries that participated in PIAAC.

However, certain countries show notable gains in equity over the same period. In Singapore, equity has improved markedly over time. Among the oldest cohort, those with highly educated parents were 55 percentage points more likely to complete tertiary education than those with low-educated parents; yet among the youngest cohort, those with highly educated parents were only 36 percentage points more likely than those with low-educated parents to complete that level of education. The United States and Germany also showed moderate improvements over the period. In the United States, the difference in the probability of completing tertiary education between these two groups fell from 50 to 48 percentage points; in Germany, the difference dropped from 45 to 43 percentage points (Figure 2.17).

Yet there are also a number of countries where equity has declined over time. In the Czech Republic, the disparity in the attainment of tertiary education between adults with highly educated parents and those with low-educated parents increased from 47 to 57 percentage points over the period; in Italy, the difference increased from 52 to 60 percentage points; and in Chile, the difference increased from 49 to 54 percentage points (Figure 2.17).

Some 41% of adults between the ages of 26 and 65 experienced upward mobility, meaning that they attained a higher level of education than their parents, on average across countries that participated in the Survey of Adult Skills (PIAAC) (Figure 1.3). In most PIAAC-participating countries, upward educational mobility was less prevalent among members of younger cohorts than of older cohorts (Figure 1.3). Most countries follow an inverted U-shaped trajectory of upward mobility, which is largely dependent on the timing of the country's expansion of education. Significant expansion often results in substantial absolute upward mobility, as average education levels within a population rise, and large shares of the population more easily surpass their parents' educational attainment. However, as the average level of education within a population increases, upward educational mobility becomes less prevalent. This is observed in many developed nations, where larger shares of the population are now secondary- and tertiary-educated, and therefore smaller shares of subsequent generations can be considered as upwardly mobile. If these trends continue, future generations will be less likely to experience upward mobility than today's adults.

These findings show that expansion of access to education does not automatically result in greater equity in educational attainment. Educational expansion opens opportunities for education to more students. Who these new students are, however, can determine whether expansion improves equity. For expansion to result in greater equity, disadvantaged students need to benefit as much as or more than advantaged students. Findings show that, in recent decades, the children of families with higher levels of education were more likely than the children of families with lower levels of education to benefit from educational expansion. Previous studies suggest that, unless special policies are put into place to assist disadvantaged students in accessing tertiary education, wealthy and middle-class families will maintain their relative advantage (Raftery and Hout, 1993[26]). It remains to be seen whether, once the proportion of socio-economically advantaged students completing tertiary education plateaus, disadvantaged students will enrol in tertiary education in larger numbers. It will also be important to monitor whether new kinds of inequalities in post-secondary education become more prominent (Bar Haim and Shavit, 2013[27]; Gerber and Cheung, 2008[28]).

These findings also suggest that countries cannot rely solely on expanding access to increase educational mobility or to improve equity in the completion of tertiary education. Because gaps related to socio-economic status appear early, countries must consider ways to equalise learning opportunities during early childhood and adolescence in order to see greater improvements in educational and social mobility. Disparities in tertiary attainment build upon earlier disparities in learning, which stem from differences in school quality throughout compulsory education. In other words, equality of opportunities in education should not be measured just by the level of education people reach, but by the quality of education that students receive, and ultimately by what students learn and are able to do with what they learn in real-life contexts.

In addition to comparing educational attainment across different generations measured at a single point in time, this report also uses longitudinal data to analyse how disadvantaged and advantaged students who sat the PISA test progress in their education and transition into the labour market. The report shows that, among the five high-income OECD countries with available longitudinal data, adults with tertiary-educated parents are between 17 and 30 percentage points more likely to complete university, and between 7 and 20 percentage points more likely to obtain a skilled job than their peers whose parents had not attained a tertiary education (Figures 1.4 and 1.5). It also shows that differences in 15-year-olds' reading performance explain between 27% and 43% of the difference in university completion rates between advantaged and disadvantaged students (Figure 5.4), which suggests that reducing the socio-economic gaps in what students learn during compulsory schooling could increase educational mobility.

Thus the relationship between equity in education and social mobility must be better understood, particularly in a time of increasing income inequality. Unequal access to quality education can severely limit opportunities for disadvantaged students to move up the social ladder. More inclusive education – with equitable education opportunities for all – could be the basis of inclusive growth (UNICEF, 2015[29]).

Performance gaps related to students' socio-economic status narrowed across PISA cycles in certain countries.

In all countries and economies that participated in PISA 2015, socio-economic status has a large influence on students' performance in science, reading and mathematics. On average across OECD countries, the mean PISA science score among disadvantaged students was 452 points, while among advantaged students it was 540 points (Table 2.1). This gap of 88 points represents the equivalent of about three full years of schooling.

Equity in education can also be measured by the so-called "socio-economic gradient", which describes how well students' performance can be predicted based solely on their socio-economic status. In PISA 2015, about 13% of the variation in students' science performance was accounted for by students' socio-economic status, on average across OECD countries. In the countries and economies with the highest levels of equity in science performance, such as Algeria, Hong Kong (China), Iceland, Macao (China), Qatar and the United Arab Emirates, less than 5% of the variation in science performance is so accounted for, but in Ciudad Autónoma de Buenos Aires (Argentina) (hereafter "CABA [Argentina]"), France, Hungary, Luxembourg and Peru, 20% or more of students' achievement can be accounted for by students' socio-economic status alone (Figure 1.1). The strength of the relationship between socio-economic status and performance in reading and mathematics is similar to that observed in science.

If education systems around the world were to deliver truly equitable opportunities for all students to succeed in school, no differences in student performance related to socio-economic status would be found.

The good news, however, is that these differences have narrowed over PISA cycles, on average, across OECD countries and in many individual countries and economies.

Figure 1.1 [1/2] ■ Equity in cognitive achievement

Countries/economies with higher values than the OECD average
Countries/economies with values not statistically different from the OECD average
Countries/economies with lower values than the OECD average

		Variation in science performance explained by student's socio-economic status		Academic resilience among disadvantaged students[1]		Double socio-economic disadvantage		Difference in mathematics achievement between individuals who had more and individuals who had fewer than 100 books in their home…		
		PISA 2015	Difference between PISA 2006 and PISA 2015	Nationally resilient[2]	Core-skills resilient[3]	Disadvantaged students in disadvantaged schools	Score-point difference in science associated with attending an advantaged versus a disadvantaged school, among disadvantaged students	…at age 10 (TIMSS)[4]	…at age 15 (PISA)[4]	…at age 25-29 (PIAAC)[4]
		%	% dif.	%	%	%	Score dif.	Dif.	Dif.	Dif.
	OECD average	12.9	**-1.4**	11.3	25.2	48.0	**78**	m	m	m
OECD	Australia	11.7	-0.4	12.7	28.7	51.2	**86**	**0.31**	**0.49**	**0.54**
OECD	Austria	15.9	0.1	9.2	23.2	48.1	**93**	**0.44**	**0.56**	**0.66**
OECD	Belgium	19.3	-0.7	9.2	26.6	50.2	**131**	m	m	m
OECD	Canada	8.8	0.3	13.1	39.7	45.4	**46**	**0.17**	**0.40**	**0.54**
OECD	Chile	16.9	**-6.4**	8.9	7.1	54.9	**93**	m	m	m
OECD	Czech Republic	18.8	2.7	9.1	20.4	50.7	**128**	**0.45**	**0.69**	**0.74**
OECD	Denmark	10.4	**-3.6**	12.1	31.1	45.7	**45**	m	m	m
OECD	Estonia	7.8	-1.0	14.2	41.5	47.8	**37**	m	m	m
OECD	Finland	10.0	1.8	14.1	39.5	40.2	-9	m	m	m
OECD	France	20.3	-1.9	9.3	23.8	50.0	**134**	m	m	m
OECD	Germany	15.8	**-4.0**	10.4	32.0	46.1	**122**	m	m	m
OECD	Greece	12.5	-2.1	12.3	14.8	47.7	**85**	**0.28**	**0.54**	**0.55**
OECD	Hungary	21.4	0.3	7.5	14.0	55.3	**138**	m	m	m
OECD	Iceland	4.9	**-2.6**	15.5	23.5	44.8	-3	m	m	m
OECD	Ireland	12.7	-0.5	12.4	32.3	43.6	**49**	**0.40**	**0.55**	**0.58**
OECD	Israel	11.2	0.9	8.4	16.0	51.1	**89**	m	m	m
OECD	Italy	9.6	-0.6	12.1	20.8	49.2	**95**	m	m	m
OECD	Japan	10.1	1.6	11.6	40.6	49.0	**125**	m	m	m
OECD	Korea	10.1	3.1	13.1	36.5	45.6	**59**	**0.51**	0.56	**0.42**
OECD	Latvia	8.7	-0.5	12.0	22.2	46.6	**50**	m	m	m
OECD	Luxembourg	20.8	-1.7	6.1	17.1	47.4	**99**	m	m	m
OECD	Mexico	10.9	**-5.2**	11.9	3.4	59.8	**71**	m	m	m
OECD	Netherlands	12.5	-3.8	11.5	32.8	46.5	**154**	**0.39**	**0.69**	**0.77**
OECD	New Zealand	13.6	-2.0	9.9	25.4	45.1	**75**	**0.54**	**0.58**	**0.62**
OECD	Norway	8.2	-0.4	13.6	31.6	42.4	10	**0.45**	**0.57**	**0.72**
OECD	Poland	13.4	-1.4	11.1	30.3	46.3	13	m	m	m
OECD	Portugal	14.9	-1.4	11.0	25.6	48.6	**52**	m	m	m
OECD	Slovak Republic	16.0	-3.6	11.4	15.7	50.3	**151**	m	m	m
OECD	Slovenia	13.5	**-4.0**	11.5	32.2	48.2	**140**	m	m	m
OECD	Spain	13.4	1.0	11.9	24.4	50.5	**43**	m	m	m
OECD	Sweden	12.2	1.2	10.7	24.8	41.6	**21**	m	m	m
OECD	Switzerland	15.6	-0.7	9.3	27.1	44.0	**88**	m	m	m
OECD	Turkey	9.0	-6.1	13.9	7.3	48.9	**98**	m	m	m
OECD	United Kingdom[5]	10.5	-2.9	12.6	28.6	45.5	**77**	**0.51**	**0.61**	**0.85**
OECD	United States	11.4	**-6.0**	11.3	22.5	50.9	**41**	**0.51**	**0.69**	**0.70**

1. Socio-economically disadvantaged students are those whose values on the PISA index of economic, social and cultural status are among the bottom 25% within their country or economy.

2. Refers to disadvantaged students who score in the top quarter of science performance in their own country/economy.

3. Refers to disadvantaged students who score at proficiency Level 3 or above in science, reading and mathematics.

4. Standardised scores in TIMSS 1995, PISA 2000 and PIAAC. To allow for comparability among the studies, the scores of each study were transformed into standardised scores using the means and standard deviations for each country in each study.

5. Only England is considered for the analysis of disparities in numeracy at age 25-29 (PIAAC) (last two columns).

6. See notes at the beginning of the chapter.

Note: Values that are statistically significant are indicated in bold.

Sources: IEA, TIMSS dataset. OECD, PIAAC dataset. OECD, PISA 2000, 2006 and 2015 Databases, Tables 2.2, 2.5, 3.3, 3.5, 4.1, and 4.5.

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Figure 1.1 [2/2] ■ Equity in cognitive achievement

Countries/economies with higher values than the OECD average
Countries/economies with values not statistically different from the OECD average
Countries/economies with lower values than the OECD average

		Variation in science performance explained by student's socio-economic status		Academic resilience among disadvantaged students[1]		Double socio-economic disadvantage		Difference in mathematics achievement between individuals who had more and individuals who had fewer than 100 books in their home…		
		PISA 2015	Difference between PISA 2006 and PISA 2015	Nationally resilient[2]	Core-skills resilient[3]	Disadvantaged students in disadvantaged schools	Score-point difference in science associated with attending an advantaged versus a disadvantaged school, among disadvantaged students	…at age 10 (TIMSS)[4]	…at age 15 (PISA)[4]	…at age 25-29 (PIAAC)[4]
		%	% dif.	%	%	%	Score dif.	Dif.	Dif.	Dif.
	OECD average	12.9	**-1.4**	11.3	25.2	48.0	**78**	m	m	m
Partners	Albania	m	m	m	m	41.7	-3	m	m	m
	Algeria	1.4	m	20.7	0.4	42.8	**31**	m	m	m
	Brazil	12.5	**-4.5**	11.2	2.1	51.8	**67**	m	m	m
	B-S-J-G (China)	18.5	m	8.7	25.9	56.6	**131**	m	m	m
	Bulgaria	16.4	**-6.3**	9.5	9.3	52.4	**146**	m	m	m
	CABA (Argentina)	25.6	m	5.2	7.5	63.5	**134**	m	m	m
	Colombia	13.7	3.1	10.5	2.8	53.6	**52**	m	m	m
	Costa Rica	15.6	m	10.9	2.4	52.0	**42**	m	m	m
	Croatia	12.1	-0.1	13.3	20.3	43.0	**86**	m	m	m
	Cyprus[6]	9.4	m	12.1	8.8	48.7	**47**	m	m	m
	Dominican Republic	12.9	m	10.2	0	50.0	**45**	m	m	m
	FYROM	6.9	m	15.4	1.7	42.9	**60**	m	m	m
	Georgia	11.1	m	11.7	2.6	50.9	**48**	m	m	m
	Hong Kong (China)	4.9	-1.5	18.2	53.2	45.2	**75**	m	m	m
	Indonesia	13.2	3.5	12.1	1.1	55.2	**50**	m	m	m
	Jordan	9.4	-1.6	11.9	1.7	46.7	**38**	m	m	m
	Kosovo	5.1	m	16.9	0.4	41.6	**53**	m	m	m
	Lebanon	9.7	m	11.5	1.7	56.3	**63**	m	m	m
	Lithuania	11.6	-2.6	11.6	19.4	50.1	**74**	m	m	m
	Macao (China)	1.7	-0.1	20.4	51.4	48.8	11	m	m	m
	Malta	14.5	m	11.4	17.5	46.9	**109**	m	m	m
	Moldova	11.6	m	12.8	4.9	51.6	**28**	m	m	m
	Montenegro	5.0	**-2.6**	16.1	7.3	44.8	**80**	m	m	m
	Peru	21.6	m	5.6	0.6	67.7	**66**	m	m	m
	Qatar	4.4	**2.4**	12.1	6.0	54.3	**46**	m	m	m
	Romania	13.8	-1.5	11.8	5.3	49.9	**81**	m	m	m
	Russia	6.7	-0.9	13.3	24.0	50.4	**52**	m	m	m
	Singapore	16.8	m	9.5	43.2	46.3	**127**	m	m	m
	Chinese Taipei	14.1	1.0	10.7	37.1	48.0	**115**	m	m	m
	Thailand	9.0	**-6.5**	15.4	4.5	49.0	**57**	m	m	m
	Trinidad and Tobago	10.0	m	13.9	7.9	44.3	**129**	m	m	m
	Tunisia	9.0	0.1	14.7	0.7	50.4	**55**	m	m	m
	United Arab Emirates	4.9	m	10.9	8.4	48.1	**48**	m	m	m
	Uruguay	16.1	-1.6	9.2	4.6	47.5	**45**	m	m	m
	Viet Nam	10.8	m	15.5	29.8	53.5	**68**	m	m	m

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Between 2006 and 2015, equity related to science performance improved in 11 countries and economies that participated in PISA in both of those years: Brazil, Bulgaria, Chile, Denmark, Germany, Iceland, Mexico, Montenegro, Slovenia, Thailand and the United States. On average across OECD countries, in 2006, 14.4% of the variation in students' science performance was explained by students' socio-economic status, whereas in PISA 2015, 12.9% of the variation was so explained (Figure 1.1).

Similarly, between 2000 and 2015, equity related to reading performance improved in 11 out of 35 countries and economies with comparable data: Australia, Brazil, Canada, Chile, Denmark, the Former Yugoslav Republic of Macedonia (hereafter "FYROM"), Germany, Israel, Mexico, Switzerland and the United States. On average across OECD countries, in PISA 2000, 14.3% of the variation in student performance in reading was accounted for by differences in students' socio-economic status; in PISA 2015, 11.9% of the variation was so explained (Figure 2.4).

Equity related to mathematics achievement also improved over PISA cycles. On average across OECD countries, between 2003 and 2015 the percentage of variation in mathematics performance accounted for by socio-economic status decreased by 3.7 percentage points (from 16.9% in 2003 to 13.1% in 2015). During this period, 15 out of 38 countries with comparable data improved equity related to mathematics performance: Belgium, Denmark, Germany, Greece, Italy, Mexico, the Netherlands, New Zealand, Poland, Portugal, the Russian Federation (hereafter "Russia"), the Slovak Republic, Switzerland, Turkey and the United States (Figure 2.5).

The fact that equity related to student performance has improved shows that equity is not a fixed feature of education systems. Equity can improve, and over relatively short periods of time. Countries as diverse as Chile, Denmark, Germany, Mexico, Montenegro, Slovenia and the United States have improved equity in education in all three cognitive domains assessed in PISA (science, reading and mathematics). This diversity suggests that all countries can reduce the influence of socio-economic status on student performance, given the right education policies and practices.

These findings do not imply that all inequalities in student performance have narrowed. Gender and immigrant background, for example, are also significant sources of inequality in education opportunities, and the strength of their association with performance over time has been studied separately (OECD, 2016[30]).

Trends in equity in performance may offer insights into what can be expected for future generations. In education systems with greater equity in student performance, more disadvantaged students perform among the best students in their own country (national resilience). According to the findings on transition to higher education in this report, this might allow larger shares of disadvantaged students to enter and complete tertiary education. For this reason, improvements in equity in performance observed among students born between 1985 (in PISA 2000) and 2000 (in PISA 2015) may well translate into more equitable tertiary education attainment. However, in this report, the analysis of trends in attainment is based on PIAAC data for adults born between 1945 and 1989, which captures an earlier cohort than the analysis measuring trends in equity in performance.

In some countries the association between socio-economic status and academic performance did not weaken over the past decade.

Equity related to science performance decreased only in Qatar between PISA 2006 and PISA 2015, and no changes were observed in 40 countries and economies that participated in both PISA cycles (Figure 1.1).

Equity related to reading performance decreased in Belgium between PISA 2000 and PISA 2015, and no changes were observed in 23 countries that participated in both cycles (Figure 2.4).

Equity related to mathematics performance decreased in Indonesia, where the variation in performance accounted for by students' socio-economic status increased by 9.8 percentage points, from 6.3% in 2003 to 16.1% in 2015. In 22 countries that participated in both cycles (PISA 2003 and 2015), no changes were observed (Figure 2.5).

Disparities in performance related to socio-economic status develop early and widen throughout students' lives.

Based on data from the Trends in International Mathematics and Science Study (TIMSS), PISA and PIAAC, the analysis shows that differences in performance related to socio-economic status not only take root at an early age, but also are significant by the age of 10. On average among 15 year-olds across the 12 OECD countries with comparable data, more than two-thirds of the gap in mathematics scores associated with having more books at home was already observed at age 10. About half of this achievement gap among 25-29 year-olds was seen even among 10-year-olds (Figure 1.1, Figure 2.6).

The socio-economic gap in mathematics performance among 10-year-olds (as measured by TIMSS), was largest in England, Korea, New Zealand and the United States; it was about average in Australia, Austria, the Czech Republic, Ireland, Norway and the Netherlands; and it was smallest in Canada and Greece (Figure 1.1, Figure 2.6).

PISA results revealed that the achievement gap had grown, relative to that observed in the TIMSS assessment, in 7 out of the 12 countries under study. The gap in mathematics achievement among 15-year-old students (as measured by PISA) grew the most in Canada, the Czech Republic, Greece and the Netherlands; and it grew an average amount in Australia, Ireland and the United States (Figure 1.1, Figure 2.6).

By early adulthood (ages 25 to 29), inequity in mathematics achievement had become even greater. The standardised socio-economic gap in numeracy, as measured by the Survey of Adult Skills (PIAAC), grew, relative to the gap observed in TIMSS, in five out of the 12 countries. Growth in the gap was largest in Canada, England and the Netherlands, and smallest in Australia and Norway (Figure 1.1, Figure 2.6).

The evolution of disparities in performance from childhood to early adulthood offers three key lessons. First, evidence of large differences early on suggests that initial learning and development are largely influenced by factors related to family background and early environments, including early education and primary schooling. Second, the evolution of these inequalities, particularly between primary and secondary school, underscores the crucial role that schools, teachers, and education policies and practices can play in narrowing the gaps and equalising opportunities for all students. Third, a number of countries have unique profiles that do not fit into the average patterns. Notable trends are found in Korea, for example, where inequalities in achievement narrow considerably between adolescence and early adulthood; in Canada, where performance inequalities during childhood (at age 10) are smaller than those observed in other countries; and in England, where inequalities in performance grow markedly between adolescence and early adulthood. Further research into these cases might provide greater insights into the mechanisms through which inequalities in education take root and evolve, and help in the development of more effective policies.

Performance at age 15 is a strong predictor of higher education and early career outcomes.

Across the five countries included in the longitudinal analyses, student performance in PISA is strongly correlated with outcomes in early adulthood. Fifteen-year-old students who score in the top quarter in reading are between 38 and 53 percentage points more likely to complete university than students who score in the bottom quarter. Differences in 15-year-olds' reading performance explain between 27% and 43% of the difference in university completion rates between advantaged and disadvantaged students, suggesting that reducing socio-economic differences in what students learn during compulsory schooling could increase educational mobility (Figure 1.4).

In addition to furthering education, performance at age 15 is also linked to opportunities for skilled employment. Students who score in the top quarter of reading performance are between 24 and 47 percentage points more likely than students in the bottom quarter of performance to be working in a job that requires tertiary education by the age of 25. These results imply that performance during secondary school matters not only for later educational attainment, but also for shaping opportunities in the labour market during early adulthood (Figure 1.5).

Some disadvantaged students perform as well as their top-performing national peers or reach good levels of performance in core subjects.

Academic resilience, as defined in PISA, is the capacity of disadvantaged students to achieve higher levels of performance than would be predicted by their family background. This report distinguishes between different types of academic resilience to capture the notion that resilience goes beyond excellence in a single subject as measured in international comparisons. Resilience is considered using a national perspective, by comparing disadvantaged students with the best-performing students in their own countries, and also using a "core-skills" perspective, by considering the achievement of good levels of performance in science, reading and mathematics.

Some 11% of disadvantaged students across OECD countries are "nationally resilient" – meaning that they score in the top quarter of science performance in their own countries. National resilience is more prevalent in countries and economies with greater equity in education. Algeria, Hong Kong (China), Iceland, Kosovo, Macao (China) and Montenegro have the largest shares of nationally resilient students, while top-performing countries and economies Singapore and Beijing-Shanghai-Jiangsu-Guangdong (China) (hereafter "B-S-J-G [China]") have some of the smallest shares of nationally resilient students (Figure 1.1).

On average across OECD countries, 25% of disadvantaged students are "core-skills resilient", meaning that they score at PISA proficiency Level 3 or above in science, reading and mathematics. This type of academic resilience is more prevalent in countries with higher average performance. In Hong Kong (China) and Macao (China), more than half of all disadvantaged students are core-skills resilient.

School characteristics and students' attitudes and behaviours towards school tend to be more strongly associated with academic resilience than students' demographic background. The share of nationally and core-skills resilient students is greater in schools with a better disciplinary climate, and among students who do not skip school and who have greater motivation to achieve, on average across OECD countries.

Disadvantaged students express less psychological well-being than advantaged students, even when they perform similarly in PISA.

Disadvantaged students tend to express less psychological well-being than advantaged students. One indicator of psychological well-being measured in PISA is students' self-efficacy in science: how much students believe in their own capacity to perform tasks similar to those included in the PISA science assessment. The level of science self-efficacy was higher among more advantaged students in each of the 53 countries and economies that participated in both PISA 2006 and PISA 2015 (Figure 1.2). Furthermore, in nearly every country and economy that participated in PISA 2015, advantaged students were more confident in their ability to solve science problems than disadvantaged students, even when comparing students whose science knowledge and skills are demonstrably similar (Table 2.9).

On average across OECD countries and in 33 countries and economies with comparable data, the disparities in students' science self-efficacy related to socio-economic status did not change in magnitude between PISA 2006 and PISA 2015 (Figure 2.8).

Students' career expectations reflect their psychological well-being. Positive expectations for the future signal high self-esteem and effective coping mechanisms. In every country and economy that participated in PISA 2015, socio-economically advantaged students expected to be employed in occupations of higher social status than disadvantaged students (as measured by the International Socio-economic Index of Occupational Status [Ganzeboom and Treiman, 2003[31]]) (Figure 1.2). In all OECD countries, differences in career expectations related to socio-economic status were significant, even after accounting for students' performance in science (in Israel, the difference is not significant after accounting for performance) (Table 2.11).

These differences in career expectations were larger in PISA 2006 than in PISA 2015, on average across OECD countries and in 18 of the 51 countries and economies with comparable data. Disparities in career expectations related to socio-economic status have narrowed over time as the share of disadvantaged students who expect to work in a high-status career grew by more than the share of advantaged students with similar career expectations. By contrast, the gap in expectations related to socio-economic status was wider in 2015 than in 2006 in 14 countries (Figure 2.9).

Socio-economic disparities in students' social well-being are small.

Students' social well-being is measured by examining students' sense of belonging at school: the extent to which students feel accepted by and connected to their peers, and part of the school community. Students from socio-economically advantaged families enjoy a stronger sense of belonging at school than disadvantaged students (Figure 1.2). However, the disparity between the two groups of students is not large because most disadvantaged students feel they belong at school. In PISA 2015, on average across OECD countries, 77% of advantaged students and 69% of disadvantaged students reported that they feel they belong at school (Table 2.6). In most countries, differences in sense of belonging at school related to socio-economic status disappear once student performance is taken into account (Table 2.7).

Figure 1.2 [1/2] ■ Equity in student well-being

Countries/economies with higher values than the OECD average
Countries/economies with values not statistically different from the OECD average
Countries/economies with lower values than the OECD average

		Difference between socio-economically advantaged and disadvantaged students in…			Socially and emotionally resilient students[4]
		…index of science self-efficacy[1]	…career expectations[2]	…sense of belonging at school[3]	
		Index dif.	Index dif.	% dif.	%
	OECD average	**0.60**	**50.2**	**7.7**	26.2
OECD	Australia	**0.73**	**50.6**	**13.2**	m
OECD	Austria	**0.84**	**55.4**	**7.5**	27.9
OECD	Belgium	**0.72**	**53.0**	**13.2**	26.3
OECD	Canada	**0.72**	**46.3**	**15.0**	m
OECD	Chile	**0.49**	**41.0**	**3.9**	22.8
OECD	Czech Republic	**0.52**	**58.1**	**10.2**	29.8
OECD	Denmark	**0.77**	**51.4**	**13.6**	m
OECD	Estonia	**0.54**	**51.3**	**9.3**	29.4
OECD	Finland	**0.63**	**58.9**	**7.2**	38.6
OECD	France	**0.75**	**55.6**	**12.9**	30.8
OECD	Germany	**0.56**	**55.5**	**5.7**	36.0
OECD	Greece	**0.51**	**46.3**	2.9	20.3
OECD	Hungary	**0.39**	**57.2**	**8.5**	24.6
OECD	Iceland	**0.80**	**45.9**	**7.5**	30.4
OECD	Ireland	**0.75**	**47.2**	**8.2**	24.8
OECD	Israel	**0.46**	**41.8**	m	m
OECD	Italy	**0.46**	**52.8**	**4.2**	15.6
OECD	Japan	**0.58**	**49.9**	**6.1**	19.6
OECD	Korea	**0.69**	**44.0**	**12.8**	25.5
OECD	Latvia	**0.47**	**54.0**	3.2	32.6
OECD	Luxembourg	**0.76**	**54.7**	**17.4**	25.8
OECD	Mexico	**0.23**	**37.2**	1.6	21.8
OECD	Netherlands	**0.53**	**53.7**	**5.3**	50.2
OECD	New Zealand	**0.74**	**47.3**	**13.1**	m
OECD	Norway	**0.63**	**49.5**	**8.6**	m
OECD	Poland	**0.53**	**56.3**	**7.2**	27.4
OECD	Portugal	**0.66**	**46.6**	1.6	16.5
OECD	Slovak Republic	**0.60**	**56.3**	**7.7**	25.7
OECD	Slovenia	**0.60**	**51.3**	0.8	22.2
OECD	Spain	**0.64**	**47.3**	2.4	19.7
OECD	Sweden	**0.69**	**54.4**	**8.3**	m
OECD	Switzerland	**0.56**	**54.7**	**4.1**	43.2
OECD	Turkey	**0.26**	**42.5**	1.5	13.1
OECD	United Kingdom	**0.61**	**44.8**	**9.3**	15.3
OECD	United States	**0.65**	**43.3**	**8.3**	18.3

1. In PISA 2015, students were asked to rate how they would perform on different science tasks, using a four-point scale with the answers: "I could do this easily"; "I could do this with a bit of effort"; "I would struggle to do this on my own"; and "I couldn't do this". This index was scaled using the IRT scaling model. The higher the value, the greater the level of science self-efficacy.

2. In PISA 2015, students were asked "What kind of job do you expect to have when you are about 30 years old?" This was an open question and responses were coded to four-digit ISCO (International Standard Classification of Occupations) codes, and then mapped to the ISEI (International Socio-Economic Index of occupational status) index (Ganzeboom and Treiman, 2003). Higher scores in the ISEI index indicate higher occupational status.

3. Refers to the percentage of students who feel they belong at school.

4. Refers to disadvantaged students who are satisfied with their life, feel socially integrated at school and do not suffer from test anxiety.

5. See notes at the beginning of the chapter.

Note: Values that are statistically significant are indicated in bold.

Source: OECD, PISA 2015 Database, Tables 2.6, 2.8, 2.10 and 3.9a.

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Figure 1.2 [2/2] ■ Equity in student well-being

Countries/economies with higher values than the OECD average
Countries/economies with values not statistically different from the OECD average
Countries/economies with lower values than the OECD average

		Difference between socio-economically advantaged and disadvantaged students in…			Socially and emotionally resilient students[4]
		…index of science self-efficacy[1]	…career expectations[2]	…sense of belonging at school[3]	
		Index dif.	Index dif.	% dif.	%
	OECD average	**0.60**	**50.2**	**7.7**	26.2
Partners	Albania	**0.47**	**51.0**	-2.3	m
	Algeria	**0.39**	**41.9**	-0.4	m
	Brazil	**0.55**	**40.2**	**6.9**	9.5
	B-S-J-G (China)	**0.69**	**48.6**	2.1	16.3
	Bulgaria	**0.51**	**51.1**	-1.0	17.8
	CABA (Argentina)	**0.73**	**33.7**	3.6	m
	Colombia	**0.16**	**39.1**	-0.6	9.3
	Costa Rica	**0.35**	**39.4**	1.7	10.2
	Croatia	**0.67**	**57.2**	0.6	36.5
	Cyprus[5]	**0.50**	**47.3**	**-3.2**	21.9
	Dominican Republic	0.00	**37.0**	**10.2**	9.5
	FYROM	**0.56**	**49.7**	-0.1	m
	Georgia	**0.51**	**40.1**	**-10.5**	m
	Hong Kong (China)	**0.48**	**41.8**	**7.4**	13.9
	Indonesia	**0.35**	**46.0**	1.7	m
	Jordan	**0.39**	**41.4**	-0.6	m
	Kosovo	**0.37**	**42.1**	-0.4	m
	Lebanon	**0.43**	**34.8**	3.2	m
	Lithuania	**0.53**	**52.3**	**13.7**	23.9
	Macao (China)	**0.54**	**44.1**	**14.9**	18.3
	Malta	**0.91**	**46.5**	**6.4**	m
	Moldova	**0.48**	**55.9**	**-8.5**	m
	Montenegro	**0.30**	**47.8**	**-5.4**	19.4
	Peru	**0.16**	**42.2**	**-12.9**	10.3
	Qatar	**0.36**	**39.1**	**3.4**	18.7
	Romania	**0.24**	**58.3**	**-6.9**	m
	Russia	**0.67**	**46.0**	1.4	26.9
	Singapore	**0.80**	**32.5**	**10.4**	m
	Chinese Taipei	**0.80**	**50.8**	**2.1**	16.5
	Thailand	**0.11**	**46.0**	2.4	23.8
	Trinidad and Tobago	**0.56**	**44.0**	1.3	m
	Tunisia	**0.25**	**44.1**	0.6	16.8
	United Arab Emirates	**0.41**	**38.2**	-0.5	21.3
	Uruguay	**0.44**	**47.2**	**5.8**	13.4
	Viet Nam	**0.40**	**48.4**	-1.0	m

1. In PISA 2015, students were asked to rate how they would perform on different science tasks, using a four-point scale with the answers: "I could do this easily"; "I could do this with a bit of effort"; "I would struggle to do this on my own"; and "I couldn't do this". This index was scaled using the IRT scaling model. The higher the value, the greater the level of science self-efficacy.

2. In PISA 2015, students were asked "What kind of job do you expect to have when you are about 30 years old?" This was an open question and responses were coded to four-digit ISCO (International Standard Classification of Occupations) codes, and then mapped to the ISEI (International Socio-Economic Index of occupational status) index (Ganzeboom and Treiman, 2003). Higher scores in the ISEI index indicate higher occupational status.

3. Refers to the percentage of students who feel they belong at school.

4. Refers to disadvantaged students who are satisfied with their life, feel socially integrated at school and do not suffer from test anxiety.

5. See notes at the beginning of the chapter.

Note: Values that are statistically significant are indicated in bold.

Source: OECD, PISA 2015 Database, Tables 2.6, 2.8, 2.10 and 3.9a.

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Figure 1.3 ■ **Equity in educational attainment**

		Disadvantaged[1] adults who completed tertiary education			Adults who reported higher educational attainment than their parents (upward social mobility)			Increased likelihood of completing tertiary education among advantaged[2] adults, relative to disadvantaged adults
		All (26-65 years old)	Older adults (56-65 years old)	Younger adults (26-35 years old)	All (26-65 years old)	Older adults (56-65 years old)	Younger adults (26-35 years old)	All (26-65 years old)
		%	%	%	%	%	%	Odds ratio
	PIAAC average	21.2	17.6	30.0	41.1	42.9	34.7	**11.1**
OECD	Australia	25.4	22.1	24.7	40.9	43.5	36.4	**5.9**
OECD	Austria	10.1	8.2	c	28.9	29.4	22.7	**7.0**
OECD	Belgium	21.7	15.8	24.0	46.9	48.0	35.8	**9.0**
OECD	Canada	36.7	32.8	39.1	42.1	51.7	28.2	**4.5**
OECD	Chile	13.7	15.0	17.4	38.2	33.4	37.0	**13.1**
OECD	Czech Republic	3.6	6.2	c	22.3	25.4	19.6	**34.1**
OECD	Denmark	27.3	23.2	33.0	36.5	43.5	28.2	**5.2**
OECD	England	22.9	20.0	23.0	39.0	40.4	33.4	**9.3**
OECD	Estonia	26.4	26.3	c	41.5	56.7	22.8	**4.5**
OECD	Finland	34.1	26.2	35.2	55.4	61.1	38.4	**3.6**
OECD	France	16.9	11.3	24.2	45.2	41.2	41.3	**13.6**
OECD	Germany	14.9	c	c	24.4	33.2	20.5	**7.9**
OECD	Greece	17.4	13.3	22.2	47.5	40.2	47.4	**9.2**
OECD	Ireland	21.3	12.1	33.3	44.6	35.6	44.4	**8.4**
OECD	Israel	31.5	31.8	30.9	40.1	51.7	29.6	**6.8**
OECD	Italy	6.7	4.8	10.2	34.2	22.6	46.1	**24.9**
OECD	Japan	23.8	16.6	c	41.3	47.5	26.9	**9.1**
OECD	Korea	27.2	11.2	53.1	56.9	35.8	61.8	**8.2**
OECD	Netherlands	22.6	17.7	27.1	41.9	39.1	37.4	**5.9**
OECD	Northern Ireland	19.1	15.5	18.5	39.1	37.2	36.8	**9.8**
OECD	New Zealand	39.2	39.4	42.3	40.0	46.5	32.3	**3.4**
OECD	Norway	25.2	21.7	34.2	34.9	41.7	23.2	**5.3**
OECD	Poland	9.1	8.6	c	44.1	53.0	36.9	**26.8**
OECD	Slovak Republic	6.1	6.2	c	33.4	42.6	24.0	**29.2**
OECD	Slovenia	9.3	5.5	16.5	38.5	40.0	32.6	**14.3**
OECD	Spain	24.1	12.6	29.5	39.8	27.4	43.1	**7.6**
OECD	Sweden	21.3	20.1	24.9	41.3	50.4	25.8	**4.4**
OECD	Turkey	10.3	8.1	14.2	27.5	17.5	37.0	**20.9**
OECD	United States	15.2	18.6	c	30.9	41.0	24.3	**9.6**
Partners	Cyprus[3]	24.3	17.2	36.0	60.2	52.1	55.6	**10.8**
Partners	Lithuania	12.8	14.1	c	43.8	73.9	10.6	**7.2**
Partners	Russian Federation[4]	45.4	42.8	46.0	58.3	64.1	43.6	**7.4**
Partners	Singapore	35.4	17.9	61.2	57.8	46.8	60.5	**18.0**

1. Adults with parents who did not complete lower secondary education.
2. Adults with at least one parent who completed tertiary education.
3. See notes at the beginning of the chapter.
4. See note at the beginning of the chapter.
Note: Values that are statistically significant are indicated in bold.
Source: OECD, PIAAC Dataset, Tables 2.18, 2.19, 2.22, 2.23 and 2.24.
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Figure 1.4 ■ **Educational mobility (longitudinal evidence)**

	University completed by age 25							
	Bottom quarter of reading performance in PISA 2000	Difference between top and bottom quarters of reading performance in PISA 2000	Disadvantaged students[1]	Difference between advantaged[2] and disadvantaged students	Difference between advantaged and disadvantaged students, after accounting for reading performance	In school with low peer expectations (% of all the other students in the school [excluding the respondent] expecting to complete university is lower than country average)	Difference between those who had attended schools with low and schools with high peer expectations	Difference at age 25 between those who had attended schools with high peer expectations and those who had attended schools with low peer expectations, after accounting for student and school reading performance
	%	% dif.	%	% dif.	% dif.	%	% dif.	% dif.
Australia	15.1	**50.8**	29.3	**21.1**	**14.7**	25.9	**27.3**	**20.0**
Canada	9.3	**53.2**	24.3	**17.0**	**10.8**	27.8	**13.6**	**7.1**
Denmark	7.3	**44.3**	14.3	**19.1**	**11.0**	24.0	**6.9**	0.6
Switzerland	1.3	**37.9**	11.1	**16.5**	**10.2**	8.6	**22.2**	**10.0**
United States	9.2	**50.8**	21.9	**29.7**	**21.7**	m	m	m

1. Disadvantaged students are those without a tertiary-educated parent.
2. Advantaged students are those with a tertiary-educated parent.
Note: Values that are statistically significant are indicated in bold.
Sources: See Tables 5.3, 5.4 and 5.30 of this report.
OECD, PISA 2000 and 2003 databases.
For Australia: Longitudinal Surveys of Australian Youth (LSAY).
For Canada: Youth in Transition Survey (YITS).
For Denmark: OECD, PISA Database and PIAAC Dataset.
For Switzerland: Transitions from Education to Employment (TREE1)[1].
For the United States: Educational Longitudinal Study of 2002 (ELS).
StatLink https://doi.org/10.1787/888933830120

There has been little change over time in the gap in students' sense of belonging at school related to socio-economic status. Only in four countries did this gap shrink over PISA cycles (Bulgaria, Japan, the Netherlands and Portugal); in six countries the gap widened (Australia, Brazil, New Zealand, Singapore, the Slovak Republic and Sweden) (Figure 2.7).

Social and emotional resilience has been shown to reinforce academic resilience.

Student resilience is considered not only in terms of academic performance, as in previous PISA reports, but also in terms of social and emotional well-being. Student well-being is positively related to academic performance. Both dimensions are mutually reinforcing parts of a successful school experience.

Some 26% of disadvantaged students across OECD countries are "socially and emotionally resilient", meaning that they are satisfied with their life, feel socially integrated at school and do not suffer from test anxiety. In Croatia, the Czech Republic, Finland, France, Germany, Iceland, Latvia, the Netherlands and Switzerland, the share of socially and emotionally resilient students is among the largest (30% or more) found across all countries; but in other European countries, including Bulgaria, Italy, Montenegro, Portugal and the United Kingdom, the share is

comparatively small (less than 20%). In top-performing Asian countries and economies, such as B-S-J-G (China), Hong Kong (China), Japan, Macao (China) and Chinese Taipei, the share is also small (20% or less), but the Latin American countries of Brazil, Colombia, Costa Rica, the Dominican Republic, Peru and Uruguay, and also Turkey, have the smallest proportions of socially and emotionally resilient students overall (less than 15%) (Figure 1.2).

Figure 1.5 ■ **School-to-work transitions (longitudinal evidence)**

	Employed in a skilled[1] job at age 25							
	Bottom quarter of performance in PISA 2000	Difference between top and bottom quarters of performance in PISA 2000	Disadvantaged students[2]	Difference between advantaged[3] and disadvantaged students	Difference between advantaged and disadvantaged students, after accounting for reading performance	Had not expected to work in a skilled job at age 15	Difference between those who had and those who had not expected to work in a skilled job when they were 15 years old	Difference between those who had and those who had not expected to work in a skilled job when they were 15 years old, after accounting for reading performance
	%	% dif.	%	% dif.	% dif.	%	% dif.	% dif.
Australia	14.2	**33.9**	22.2	**15.3**	**10.2**	20.1	**20.4**	**14.2**
Canada	18.2	**24.0**	26.6	**7.2**	3.7	25.4	**11.4**	**7.2**
Denmark	21.7	**47.3**	30.5	**20.2**	**11.0**	26.5	**39.5**	**32.5**
Switzerland	12.7	**23.5**	16.7	**12.6**	**10.1**	19.5	**10.0**	4.8
United States	30.0	**25.2**	35.5	**16.5**	**12.5**	m	m	m

1. A skilled job means a job requiring tertiary education.
2. Disadvantaged students are those without a tertiary-educated parent.
3. Advantaged students are those with a tertiary-educated parent.
Note: Values that are statistically significant are indicated in bold.
Sources: See Tables 5.10, 5.19 and 5.20 of this report.
OECD, PISA 2000 and 2003 databases.
For Australia: Longitudinal Surveys of Australian Youth (LSAY).
For Canada: Youth in Transition Survey (YITS).
For Denmark: OECD, PISA Database and PIAAC Dataset.
For Switzerland: Transitions from Education to Employment (TREE1).
For the United States: Educational Longitudinal Study of 2002 (ELS).
StatLink https://doi.org/10.1787/888933830139

Disadvantaged students who are socially and emotionally resilient also tend to do better academically. This implies that helping disadvantaged students develop positive attitudes and behaviours towards themselves and their education can also benefit these students' academic development. Academic resilience can also promote social and emotional resilience, creating a cycle of positive reinforcement.

A positive relationship between national resilience (disadvantaged students who perform as well as the top performers in their own countries), and social and emotional resilience is significant in 30 out of the 48 countries and economies for which data is available. In Belgium and Bulgaria, nationally resilient students are almost three times more likely than disadvantaged students who are not nationally resilient to also be socially and emotionally resilient (Figure 3.11).

Similarly, the positive relationship between core-skills resilience (disadvantaged students who score at proficiency Level 3 or above in science, reading and mathematics), and social and emotional resilience is significant in 28 countries and economies. In Brazil and Mexico, core-skills resilient students are almost three times more likely than disadvantaged students who are not core-skills resilient to be socially and emotionally resilient as well (Figure 3.11).

Disadvantaged students face a variety of barriers to learning.

Family background and early environments are strongly linked to student learning and performance. Research shows that students from low-income and single-parent households tend to have significantly lower performance during both primary and secondary schooling (Barajas, 2011[32]; Ferguson, Bovaird and Mueller, 2007[33]). This gap can still be observed in university completion rates at the age of 25 (Figure 5.12). Specifically, students from low-income and single-parent households are between 7 and 17 percentage points less likely to complete university (Tables 5.26 and 5.33). While this does not suggest a causal relationship, it highlights the potential effects that limited resources at home can have on education opportunities and attainment.

Less household wealth often translates into fewer educational resources, such as books, games and interactive learning materials in the home. In addition, families with limited income may not have access to early education if it is not publicly funded; and children from these families are shown to benefit the most from such opportunities. Single parents have to shoulder double the responsibilities as parents in a two-parent household, which may limit their time to engage and interact with their children.

These results emphasise the importance of identifying the specific inequities faced by disadvantaged children, both during early stages of development and outside the classroom during compulsory schooling. Not only do these factors contribute to academic performance and educational attainment, they are also likely to shape students' expectations, attitudes, and beliefs regarding education and opportunity.

Many disadvantaged students are concentrated in lower-quality schools.

There is a strong link between schools' socio-economic profile and students' performance: students who attend more socio-economically advantaged schools perform better in PISA. Hence, disadvantaged students attending disadvantaged schools are, *a priori*, doubly disadvantaged as they strive for academic achievement (Figure 1.1).

Countries that participated in the 2015 PISA assessment differ in the degree to which their school systems segregate disadvantaged students into certain schools. On average across OECD countries, 48% of disadvantaged students attended disadvantaged schools in PISA 2015; and there has been no significant change in the average level of segregation of disadvantaged students in most PISA-participating education systems.

On average across OECD countries, disadvantaged students attending advantaged schools score 78 points higher than those attending disadvantaged schools. Disadvantaged students attending schools with an average socio-economic profile (schools that are neither advantaged nor disadvantaged) score 36 points higher than those attending disadvantaged schools.

A school's socio-economic profile is most strongly related to performance in Belgium, B-S-J-G (China), Bulgaria, CABA (Argentina), France, Hungary, the Slovak Republic, Slovenia and the Netherlands, where disadvantaged students attending advantaged schools score more than 130 points higher in science than those in disadvantaged schools. By contrast, in Albania, Finland, Iceland, Macao (China), Norway and Poland, there is no significant difference in the performance of disadvantaged students related to whether they attend advantaged or disadvantaged schools (Figure 1.1).

Several factors explain this relationship between a school's socio-economic profile and the performance of disadvantaged students. The academic level of peers in the school, the availability of science-specific resources and science competitions, the disciplinary climate, class size, student truancy, and the various pedagogical strategies used are all potential mediating factors between school socio-economic profile and the performance of disadvantaged students (Figures 4.5 and 4.6). In other words, the aforementioned are school characteristics that tend to be related to performance, and the more positive of these characteristics tend to be found more commonly in socio-economically advantaged schools. For example, clustering disadvantaged students in certain schools can affect performance because teachers may adapt their academic standards to the average level of their classes, resulting in less stimulating and demanding learning environments in schools with larger shares of disadvantaged students. Teachers might also be more attracted to schools with fewer disciplinary problems and more resources, which is more often the case in advantaged schools.

WHAT THE RESULTS IMPLY FOR POLICY

Policies and practices aimed at providing more equal education opportunities for all children can be implemented at the classroom, school and education-system levels. Such policies may have more success if they are implemented as early as possible, and if they dismantle the extensive barriers to learning that disadvantaged students face, focus on students' attitudes, and social and emotional well-being, and are coupled with education and social programmes that improve students' environments outside of school. This section offers a series of general policy recommendations, based on the results from this report, that countries can use to identify the most appropriate tools for improving equity in education and social mobility in their own specific contexts.

Support disadvantaged children, adolescents and young adults in their education

Findings in this report show that disparities in performance related to socio-economic status develop early and widen throughout students' lives. They also show that in different countries inequity increases more markedly during specific life stages (childhood, adolescence or young adulthood) than in others. For example, in England, Korea, New Zealand and the United States, inequity is comparatively large during childhood (as measured by TIMSS, when students are 10 years old), whereas in Australia, Canada and Greece inequities are smaller at this stage. But in the latter three countries, and also in the Czech Republic, Ireland, the Netherlands and the United States, inequity grows significantly during adolescence; and in Australia, Canada, England, the Netherlands and Norway, inequity increases significantly during early adulthood (as measured by the Survey of Adult Skills among 25-29 year-olds) (Figure 2.6). Therefore,

each country needs to understand at what age inequity begins to affect individuals and how it deepens over a lifetime. This might require developing age-appropriate national assessments and conducting longitudinal studies. Countries need to consider creating and reinforcing policies and programmes that support disadvantaged students at the stages in which inequity is most prevalent, and during the periods immediately before these inequities arise. Such policies can help prevent inequities from developing and limit those that may have already taken root.

Provide quality early-education programmes to disadvantaged children

A finding common across countries is that inequity in education is already observed by age 10; this leads to the second policy implication of the report: the importance of early intervention. Early childhood education and care are critical vehicles for providing more equitable learning environments early on. Studies in the United States show that disadvantaged children benefit most from a wide range of means-tested and universal early childhood education programmes – including Head Start, state preschool programmes and demonstration programmes, such as the Perry Preschool Program and the Carolina Abecedarian Project – and society earns higher returns from targeted investments (Heckman, 2016[34]). Such studies have investigated the short- and long-term effects of providing high-quality early childhood education and care to impoverished, at-risk children, often while coupling these interventions with health, nutrition and parent-involvement services. By conducting a series of follow-up interviews with people who had attended such programmes through adolescence and adulthood (up to ages 35-40), researchers were able to compare various life outcomes across treatment and control groups. Studies reveal that these programmes offer substantial lifelong benefits, including higher educational attainment and career achievement, reduced criminal activity, better health, and stronger family and personal relationships (Schweinhart et al., 2005[35]; Conti, Heckman and Pinto, 2015[36]).

In addition, quality early childhood education helps children acquire essential social and emotional skills. Yet in many countries, poor and minority families are less likely to enrol their children in such programmes. Countries should promote greater access to these programmes, particularly among disadvantaged families. In some countries, a first step is to fund the development of more quality early childhood education and care establishments in order to meet demand. If enrolment fees are required, policies that subsidise or reduce the costs for poor families may lead to considerable gains in attendance. In addition, sufficient resources must be allocated to improve the quality of these programmes, by assuring that teachers are qualified and well-trained, and that the environment is conducive to learning for all students.

Set ambitious goals and monitor the progress of disadvantaged students

Countries could set progressive benchmarking points to monitor their progress in equity in education. For example, when it comes to improving the academic performance of disadvantaged students, countries might want to distinguish between benchmarks based on national criteria, such as reaching a certain share of disadvantaged students who achieve excellence by national standards (i.e. national resilience), and benchmarks based on international or absolute criteria, such as reaching a certain share of disadvantaged students who achieve proficiency Level 3 in PISA in science, reading and mathematics (i.e. core-skills resilience). All countries might want to define ambitious national goals, such as ensuring that 20% of disadvantaged students are nationally resilient (the current share of national resilience is between 7% and 14% in most

OECD members and partner countries [Figure 1.1]). If 25% of disadvantaged students scored among the top quarter of all students in a country, it would be as if performance was unrelated to socio-economic background (complete equity).

Top-performing and low-performing countries start from very different points. Top-performing countries might want to set a goal of ensuring that 75% of disadvantaged students are core-skills resilient; the current OECD average is 25% (Figure 1.1). In the lowest-performing countries, a small minority of students reaches proficiency Level 3 in reading, mathematics and science; therefore, ensuring that 25% of disadvantaged students are core-skills resilient (the current OECD standard) can be defined as a long-term goal for these countries, to be achieved as the education system improves its overall quality.

Develop teachers' capacity to detect student needs and manage diverse classrooms

Changing practices inside the classroom can help reduce cognitive and socio-emotional gaps related to socio-economic status. By providing schools with services such as specialised teacher support and training, teachers may be better equipped with the skills to identify and address learning difficulties, develop more customised and effective teaching methods, and foster self-esteem and positive attitudes among disadvantaged students. Often, programmes that conduct more frequent assessments and monitor individual performance help teachers identify struggling students and track student progress more effectively. These activities should be coupled with greater enthusiasm for personalised learning and the use of technologies that facilitate it.

In addition, schools that provide guidance and career counselling to students may be able to complement efforts in the classroom, and help students assess their progress and think strategically about goals and aspirations. While advantaged students tend to enjoy the benefits of stronger support networks and mentorship outside of the classroom, thus requiring less from their school environments, this is often not the case for disadvantaged students. When schools and teachers understand the barriers that disadvantaged students face, and allocate resources to initiatives that have been proven successful, they can help students overcome these obstacles.

By contrast, the risks of managing student heterogeneity by implementing rigid stratification policies are well-documented (Dupriez, Dumay and Vause, 2008[37]). Tracking has been shown to increase inequality in education, particularly within systems that track students into different schools at early ages (Hanushek and Wossmann, 2006[38]; Van de Werfhorst and Mijs, 2010[39]). Grade repetition tends to stigmatise repeaters, undermining their self-esteem and sense of belonging at school, and reinforcing their disengagement from the learning process (Jimerson, 2001[40]; Jimerson, Anderson and Whipple, 2002[41]).

Socio-economically disadvantaged and minority students tend to perform worse during initial years of school due to differences in early education, family and home environments; in some cases, these students are also learning in a non-native language. As a result, they tend to repeat grades more often and to be sorted into education programmes that provide them with fewer learning opportunities and less-demanding content. Though managing classrooms with students of different levels and backgrounds may require the adoption of new tools and teaching practices, such settings prove to be the most beneficial for disadvantaged students.

Target additional resources towards disadvantaged students and schools

More often than not, disadvantaged students are clustered in schools where a lack of financial, material and human resources hinders student learning. Schools with more disadvantaged students tend to receive more teachers (quantity) but not necessarily more experienced and skilled teachers (quality) (OECD, 2018[42]). Achievement may suffer if a student's classmates include a large proportion of low-achieving peers (Hanushek et al., 2003[43]; Lavy, Silva and Weinhardt, 2012[44]; Burke and Sass, 2013[45]; Sacerdote, 2011[46]). For these reasons, when students from disadvantaged families attend disadvantaged schools, they face a double disadvantage that puts them at serious risk of not performing academically at adequate levels. Education systems must acknowledge this issue and provide special support for these students and their schools.

It is essential that disadvantaged students in all schools have the resources they needed to succeed. This means that funding must be targeted in a way that equalises opportunities for learning and achievement. Schools with larger shares of disadvantaged students therefore will require additional investments in human and material resources, such as improvements to school infrastructure, teacher training and support, language-development programmes for minority students, tutoring and homework-assistance services, extracurricular activities, and customised instructional programmes to address the learning challenges particular to disadvantaged and minority students. Equally important, schools with large shares of disadvantaged students must ensure that the supply of available resources is sufficient to meet the demand of all students. Disadvantaged students, even those in more advantaged schools, must be informed of and encouraged to use these services.

In countries where there is a higher concentration of disadvantaged students in certain schools, targeting resources to disadvantaged schools can be an effective strategy. In countries where disadvantaged students are less concentrated, targeting individual students and their families can be more effective.

Reduce the concentration of disadvantaged students in particular schools

Another way to address double disadvantage is to reduce the number of students suffering from it by reducing the concentration of disadvantaged students in particular schools.

Residential segregation may explain why large groups of disadvantaged students are found in the same schools. However, policies used to assign students to schools can provide opportunities to improve the level of social diversity in schools. This can happen by reshaping school catchment areas or school districts to include neighbourhoods with different social characteristics. However, these policies may, in turn, reinforce residential segregation in the long run. Black and Machin (2011[47]) review a broad range of evidence that parents may pay significantly more for housing in areas where the perceived quality of schooling is higher. Trying to achieve more diverse school enrolment in some districts may eventually lead to greater stratification between schools by outcome and ability, as more educated and wealthy parents may choose to relocate in order to have access to schools with the most favourable socio-economic status (Epple and Romano, 2003[48]).

Providing more opportunities for school choice is another mechanism that may alter the social mix in schools (Musset, 2012[49]). In theory, school choice may benefit disadvantaged students

by allowing them to leave low-performing schools when school assignment is mainly residence-based. However, most empirical evidence in countries as diverse as Chile, New Zealand, Sweden, the United Kingdom and the United States suggests that reforms introducing greater school choice also tend to increase academic and socio-economic sorting because more advantaged, highly educated families are more likely to make better-informed choices (Levin, 1998[50]; Burgess and Briggs, 2010[51]; Ladd and Fiske, 2001[52]; Söderström and Uusitalo, 2010[53]; Schneider, Elacqua and Buckley, 2006[54]; Mizala and Torche, 2012[55]).

Yet the sorting effect of school choice may be either mitigated or intensified, depending on the design of the policy (Epple, Romano and Urquiola, 2017[56]). As the OECD suggests (2017[57]), school choice can be regulated in order to promote social diversity in schools. This could be accomplished, for instance, by improving disadvantaged families' access to information about schools, and also by restricting the possibilities for schools to skim off the best students through selective admissions criteria. Local authorities may also control enrolments in order to mitigate imbalances in schools' social composition.

Some countries provide good examples of policies and tools aimed at creating more socio-economic diversity in schools. As reviewed in two OECD reports (OECD, 2017[58]; Santiago et al., 2017[59]), Chile introduced a series of recent reforms with the aim of reducing social segregation in schools and ensuring that school choice is not contingent on families' ability to pay, student achievement or other potentially discriminatory factors. The reforms regulate student admissions by forbidding the use of economic, social, ethnic, religious or academic criteria; eliminating shared funding (*financiamiento compartido*, the existence of tuition fees in parallel with public subsidies in a single school); providing greater public resources to the Preferential School Subsidy (*Subvención Escolar Preferencial*); making it impossible for schools to receive public funding to make a profit; and forbidding the expulsion of students for academic, political, ideological or other reasons.

Foster student well-being

The findings reveal that student expectations are a key factor in their future success. There are significant disparities in expectations for future education and careers between 15-year-old advantaged and disadvantaged students, and these gaps help to explain differences in educational and occupational attainment among young adults, independent of performance in PISA. Similar relationships are observed for a range of socio-emotional outcomes, including student self-efficacy, sense of belonging at school, and attitudes towards schooling. Therefore, policies aimed at promoting equity in education and educational mobility need to be multi-pronged. They need to ensure that students are given adequate educational resources that are allocated fairly at the school level, and also supply teachers with the tools to help nurture positive attitudes and aspirations among students from disadvantaged backgrounds.

While more attention has been devoted to research regarding student well-being in recent years, this is not necessarily the case for classroom pedagogy. Because student well-being is less evident and harder to measure, it can often be overlooked. Teachers may more easily interpret poor performance as a lack of effort, and fail to investigate further. This is much more likely to occur in schools with large shares of disadvantaged students, where less-experienced teachers face greater time and resource constraints, and where students tend to perform worse and have less positive

attitudes towards schooling. Yet teachers' understanding of student perceptions, favourable relationships between teachers and students, and better classroom dynamics have been shown to improve academic performance, discipline and cognitive engagement (willingness and ability to take on and learn the tasks at hand) among disadvantaged students (Whitehead, 2006[60]; Archambault, Janosz and Chouinard, 2012[61]).

Just as formative assessments can be important for monitoring students' academic progress (OECD, 2013[62]), teachers should have tools in place for observing and promoting student well-being. Research shows that teachers can foster a stronger sense of belonging for all students with activities that ask students to identify similarities among one another, to consider reasons why some students may feel that they do not belong in a particular class or school setting, or to reflect on times where they may have felt they did not belong and how those feelings changed over time (O'Reilly et al., 2017[63]).

The same study suggests that teachers may also take part in counteracting negative self-perceptions through class exercises that affirm values. For example, asking students to consider their values and explain why these values are important to them may be particularly effective when students are going through periods of transition.

Another way teachers can support student well-being is by helping students think deeply and see the relevance of what they are learning. Encouraging students to consider how new topics could apply directly to their lives, and reflect on how this information could help others, are ways that may help students to find more value in and develop greater motivation for learning (O'Reilly et al., 2017[63]).

Students are more likely to be resilient when they are taught that intellectual abilities are qualities that can be developed, rather than qualities that are fixed (Yeager and Dweck, 2012[64]). Teachers should thus emphasise the importance of persistence, effort and learning strategies as a way to advance. A series of studies revealed that teachers' praise of students' intellect led students to view their intelligence as being fixed and thus respond with less resilience following academic setbacks. By comparison, when teachers praise process and effort, student performance improves and students respond positively to more challenging tasks in the future (Mueller and Dweck, 1998[65]).

The process through which negative feedback is delivered can have similar effects. Parents and teachers may try to comfort students who perform poorly by suggesting that the subject is simply not their strength and encouraging them to focus on their successes in other domains. This form of feedback can create low confidence, low expectations and poor resilience in students (Yeager and Dweck, 2012[64]). A better way to provide feedback is by helping students see that they need better strategies to improve (Good, Rattan and Dweck, 2012[66]). Again, this method focuses more on the process than on ability and can put students in a mindset that improves their resilience to challenges.

Conducting such activities in class, in addition to developing awareness of individual students' backgrounds can help teachers anticipate and understand students' behaviour and perspectives. Using this approach, teachers may be able to more quickly identify students facing particular social and emotional challenges, and can engage student counselling services and family members for additional support.

Create a climate that favours learning and well-being

While teachers can help promote well-being in their classrooms, all school actors – staff and students – should work together to prioritise well-being in schools. Schools can give students more opportunities to engage in such efforts by encouraging students to voice their opinions on the subject, offering leadership roles through student organisations and governments, and allowing for more student-led approaches to learning and decision making. The school community can collaborate to implement targeted programmes and interventions, develop supportive policies, and design strategic approaches to address specific behaviours, including bullying and violence, and other anti-social behaviours, and psychological states, including low self-esteem, depression and grief. A growing number of both private and public organisations are developing extensive school frameworks that encourage schools and teachers to foster well-being and mental health (Stirling and Emery, 2016[67]; NSW Department of Education and Communities, 2015[68]).

Some schools are experimenting with various forms of peer-mentoring programmes, where student mentors are matched with their peers in order to provide an additional source of guidance and support. Several studies indicate positive self-reported outcomes for supported students, including a greater sense of happiness or well-being, improved self-esteem and confidence, and better social skills and school behaviour (Coleman, Sykes and Groom, 2017[69]). In some cases, peer mentors also report positive effects from participating in the programme, including (self-reported) improvements in skills, self-confidence and relationships. Studies have also shown that projects can benefit the school environment overall by fostering valuable student relationships. Students and schools benefit most from peer-mentoring programmes that are well-run, and that have a clear focus, strong leadership and school-wide support. The most effective programmes also have high-quality student mentors who are enthusiastic and committed, and have strong communication and interpersonal skills (Coleman, Sykes and Groom, 2017[69]).

Encourage parent-teacher communication and parental engagement

For in-class methods to succeed, schools and teachers need to improve communication with parents in the most disadvantaged homes and help develop home environments that are more conducive to learning. Teachers can use various forms of communication to keep parents up to date on student progress and to collaboratively address any difficulties the student might be having at school. Parent-teacher communication can also provide a platform for discussing with parents the various ways they can become more involved in their child's studies.

Parental engagement has been shown to boost achievement among disadvantaged children, improve student health and well-being, and even increase representation of minorities and female students in certain subjects, such as science, technology, engineering and mathematics (STEM) (Liu and Wang, 2008[70]; Parker, 2013[71]). Messages encouraging parental involvement from teachers and school communities have proven to significantly influence parents' behaviour (Avvisati et al., 2014[72]; Kohl et al., 2000[73]). Such communication not only helps parents understand that participation in their child's education is welcome, valuable and expected, but may be particularly significant for parents whose role is otherwise passive and whose sense of self-efficacy in helping their child succeed at school is relatively weak (Hoover-Dempsey and Sandler, 1997[74]; Hoover-Dempsey et al., 2005[75]). Parents from disadvantaged families often face greater obstacles (such as time constraints, lack of information, language barriers, etc.) to

becoming more involved in their child's learning. It is thus essential that schools take a proactive approach in encouraging parents, especially disadvantaged parents, to be part of their child's education and express positive attitudes towards learning at home.

Teacher-parent communication may also be a way to provide information regarding available extracurricular activities. Disadvantaged and minority students are much less likely to participate in after-school programmes, yet research shows that these types of activities can improve students' academic performance and boost social skills (Chanfreau et al., 2016[76]). With the known benefits of participating in activities, including sports, music, language, tutoring and the arts, schools should promote school-based clubs as an affordable alternative for poorer children, and ensure that this information is shared with students' families to encourage participation.

Note

1. The Swiss panel study TREE (Transitions from Education to Employment) is a social science data infrastructure mainly funded by the Swiss National Science Foundation (SNF) and located at the University of Bern.

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