



Growth mindset

This chapter examines differences across countries and economies in students' belief in a growth mindset, and how this belief varies with student and school characteristics. The chapter also looks at the relationship between holding a growth mindset, and students' attitudes, academic achievement and expectations of further education.

A growth mindset, or incremental theory of intelligence, is the belief that someone's ability and intelligence can develop over time. This is in contrast to a fixed mindset, or 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^[1]; Dweck, 2006^[2]). Instilling a growth mindset is often regarded as a strategy to help students expend greater effort; but effort alone is unlikely to contribute to their personal growth. Students endorsing a growth mindset also use other strategies that lead to greater learning and progress, such as learning from previous experience, responding to feedback and trying new learning strategies (Dweck, 2016^[3]; Yeager and Dweck, 2012^[4]). A growth mindset is not simply telling students that they can achieve any goal they have set for themselves; it involves creating an environment where students can develop this belief and providing them with the necessary resources and skills to achieve their learning goals (Dweck, 2016^[5]) (see Box III.14.1 for more details on misunderstandings concerning the growth mindset).

What the data tell us

- A majority of students disagreed or strongly disagreed with the statement “Your intelligence is something about you that you can't change very much”, on average across OECD countries. However, at least 60% of students in the Dominican Republic, Indonesia, Kosovo, the Republic of North Macedonia, Panama and the Philippines agreed or strongly agreed with that statement.
- On average across OECD countries, students who disagreed or strongly disagreed with the statement “Your intelligence is something about you that you can't change very much” scored 32 points higher in reading than students who agreed or strongly agreed with the statement, after accounting for the socio-economic profile of students and schools.
- On average across OECD countries, 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.
- The relationship between endorsing a growth mindset and reading performance was generally stronger amongst socio-economically disadvantaged and immigrant students than amongst advantaged and non-immigrant students, respectively.
- In about half of education systems, students who exhibited a growth mindset were more likely than students who held a fixed mindset to expect to complete a university degree, after accounting for socio-economic status, gender, immigrant background and reading performance.

There are many ways educators can try to instil a growth mindset in students. Good teachers not only help students succeed, but they also help them believe that their effort and learning strategies are the sources of their success. When teachers respond to struggling students by giving them easier tasks and praising them excessively for completing these tasks, students may interpret this as a sign of their lack of inherent ability. Instead, teachers should set challenging learning goals for every student and do whatever is needed to ensure that all students have the opportunity to learn the material in ways that are appropriate for them. Teachers should believe that all students can learn and succeed, and design the learning environment accordingly. The ultimate goal is that students are persuaded that, with the appropriate learning strategies and investment of effort, they can improve and reach their full potential. Unfortunately, many teachers give more praise, help and coaching, and lengthier answers to questions to those students whom they perceive to have greater ability (Good and Lavigne, 2017^[6]).

A growth mindset can improve the behaviours and learning outcomes of all students, but especially of those struggling academically and those from disadvantaged backgrounds (Claro, Paunesku and Dweck, 2016^[7]; Paunesku et al., 2015^[8]). According to several studies, instilling a growth mindset in students can result in greater motivation to learn, greater investment of effort and better academic performance (Blackwell, Trzesniewski and Dweck, 2007^[9]; McCutchen et al., 2016^[10]; Sriram, 2014^[11]). This is because, researchers argue, students with a fixed mindset forgo challenging learning opportunities for fear that a possible failure would signal a lack of talent. By contrast, students with a growth mindset will use any strategy at their disposal, such as expending greater effort, trying new learning strategies and seeking feedback from others, to enhance their learning (Dweck, 2010^[12]). Indeed, a fixed mindset has been associated with numerous negative outcomes, including performance-avoidance goals (the desire to avoid performing more poorly than others do) and an excessive type of perfectionism (Chan, 2012^[13]; Snipes and Tran, 2017^[14]).

This chapter examines the extent to which students believe in a growth mindset. PISA 2018 asked students whether they agreed (“strongly disagree”, “disagree”, “agree”, “strongly agree”) with the following statement: “Your intelligence is something about you that you can't change very much”. Students who disagreed with the statement are considered to have a stronger growth mindset than students who agreed with the statement.

Box III.14.1. **Misunderstandings about the growth mindset**

According to Dweck (Dweck, 2016^[5]; Dweck, 2016^[3]), the idea of a growth mindset is sometimes misunderstood, even amongst people who are familiar with the concept. One of the misunderstandings is that some people mistake endorsing a growth mindset with being open-minded and flexible.

A second misconception is that instilling a growth mindset is only about praising and rewarding effort. That is only one part of the equation, since most unproductive efforts lead nowhere. Instilling a growth mindset is about rewarding progress, and all the processes that lead to greater learning, such as trying different learning strategies, searching for feedback, focus and, of course, hard work. Praising effort too much can have the undesired effect of making students feel happy when they are actually not making any progress. That is why endorsing a growth mindset means paying greater attention to the processes of learning, and connecting these processes with improvements in learning outcomes.

A third misunderstanding, and probably the most relevant for teachers, is that instilling a growth mindset is just about telling students that they can reach any goal. Parents and teachers should certainly believe in the ability of children to reach their potential, but they need to create an appropriate learning environment for this to happen. An appropriate learning environment is one where students are encouraged to participate and are not constantly being judged, and where educators believe in students' potential to develop their skills and provide them with the necessary support and feedback. When the role played by educators is not recognised as essential for a growth mindset to take root and flourish, the responsibility for failing lies entirely with the student, even when they do not have the necessary resources to reach their full potential.

HOW THE BELIEF IN A GROWTH MINDSET VARIES ACROSS COUNTRIES, SCHOOLS AND STUDENTS

On average across OECD countries, a majority of students disagreed or strongly disagreed that intelligence is something that they cannot change very much (Figure III.14.1). However, in spite of the considerable efforts educationalists have made in recent years to promote a growth mindset (Boaler, 2015^[15]; Dweck, 2006^[2]; Dweck, 2016^[3]), 37% of students across OECD countries reported that they believe that intelligence cannot change very much over time (Table III.B1.14.1). Moreover, a majority of students in 26 countries and economies, including three OECD countries (Greece, Mexico and Poland) agreed with the fixed mindset statement "Your intelligence is something about you that you can't change very much", and in the Dominican Republic, Indonesia, Kosovo, the Republic of North Macedonia (hereafter "North Macedonia"), Panama and the Philippines, at least 60% of students endorsed a fixed mindset. In some of these education systems, the students with a fixed mindset were concentrated in certain schools (Table III.B1.14.2). In the Dominican Republic, Indonesia, Kosovo, Lebanon, Panama and Peru, for instance, more than 5% of students were enrolled in a school where at least 90% of their schoolmates held a fixed mindset ("agreed" or "strongly agreed" with the statement).

By contrast, in Austria, Denmark, Estonia, Germany, Iceland, Ireland, Latvia, Lithuania and the United Kingdom, at least 70% of students believed in a growth mindset. Of these countries, in Estonia, Latvia and Lithuania about 10% of 15-year-old students attended a school where at least 90% of their schoolmates disagreed or strongly disagreed that their intelligence cannot change much.¹

There were also wide differences across groups of 15-year-olds (Figure III.14.1). Boys were more likely than girls to agree with the statement about fixed intelligence, on average across OECD countries and in 39 school systems. The only school systems where boys were more likely than girls to disagree with the statement were Beijing, Shanghai, Jiangsu and Zhejiang (China) (hereafter "B-S-J-Z [China]"), Hong Kong (China), Korea, Macao (China), North Macedonia and Chinese Taipei. In almost every education system, socio-economically disadvantaged students were more likely than advantaged students to believe that their intelligence cannot change very much over time. Across OECD countries, students with an immigrant background were somewhat less likely to believe in a growth mindset than students without an immigrant background. However, in 18 countries, and especially in the Czech Republic, the Republic of Moldova (hereafter "Moldova"), Panama, the Philippines, Qatar and the United Arab Emirates, the gap was in favour of immigrant students (Table III.B1.14.3).

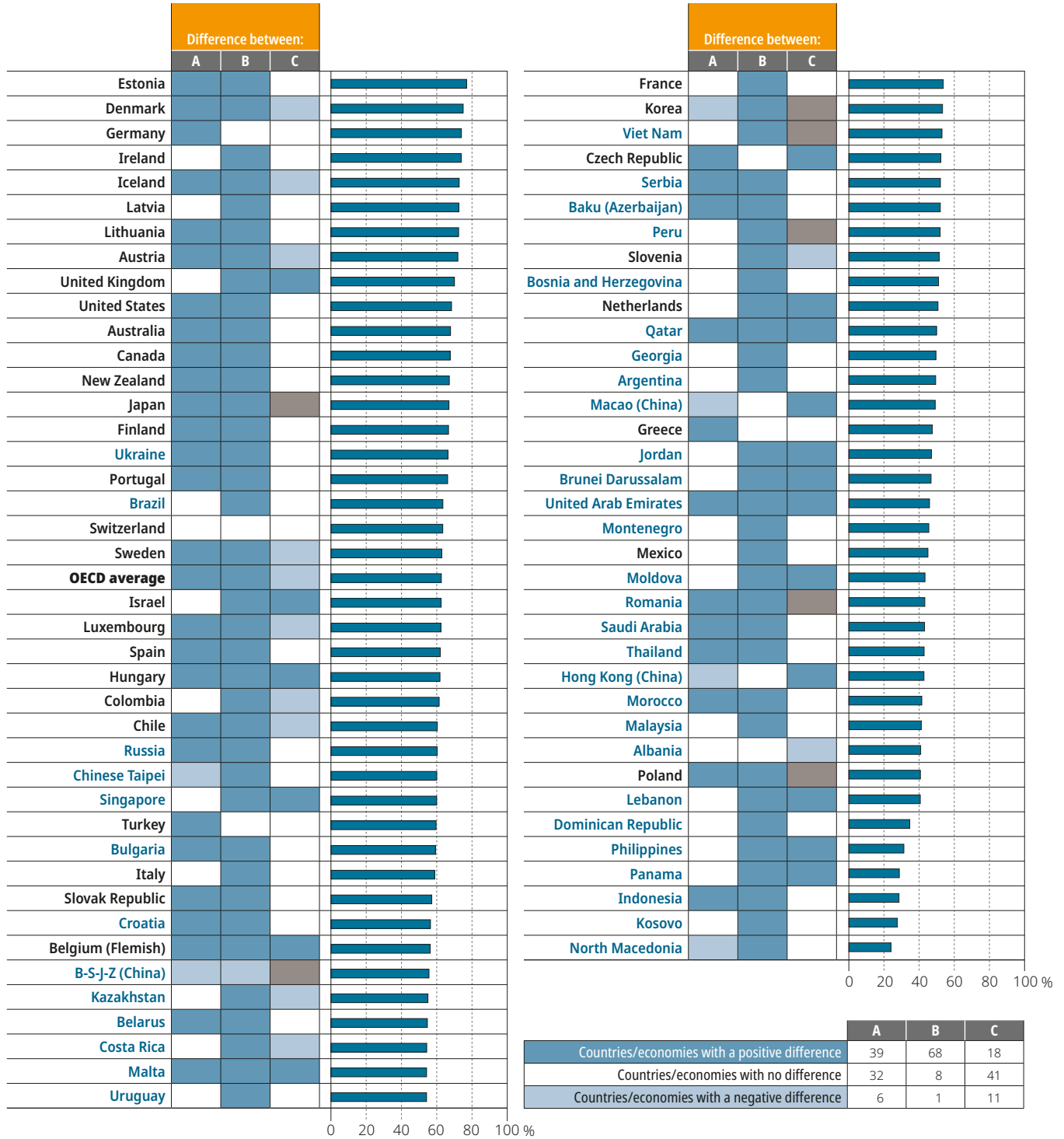
When considering differences across schools, one of the most interesting findings is that students in city schools were significantly more likely to disagree with the statement about fixed intelligence than were students in rural schools (Table III.B1.14.4). The rural-urban gap was particularly wide in Brazil, Costa Rica, France, Hungary, Moldova and Romania. Differences between socio-economically advantaged and disadvantaged schools were also large, and were consistent with the differences observed at the student level. Differences between public and private schools, and between schools with low and high concentrations of immigrant students were generally moderate in magnitude, particularly across OECD countries. However, public school students in Argentina, Brazil, Colombia, Panama and Peru were far less likely than their peers in private schools to hold a growth mindset.

Figure III.14.1 Growth mindset, by student characteristics

Percentage of students who disagreed or strongly disagreed with the statement: "Your intelligence is something about you that you can't change very much"

Positive difference Negative difference Difference is not significant Missing values

A Girls - boys B Advantaged - disadvantaged students C Immigrant - non-immigrant students



Countries and economies are ranked in descending order of the percentage of students who disagreed or strongly disagreed with the statement.

Source: OECD, PISA 2018 Database, Tables III.B1.14.1 and III.B1.14.3.

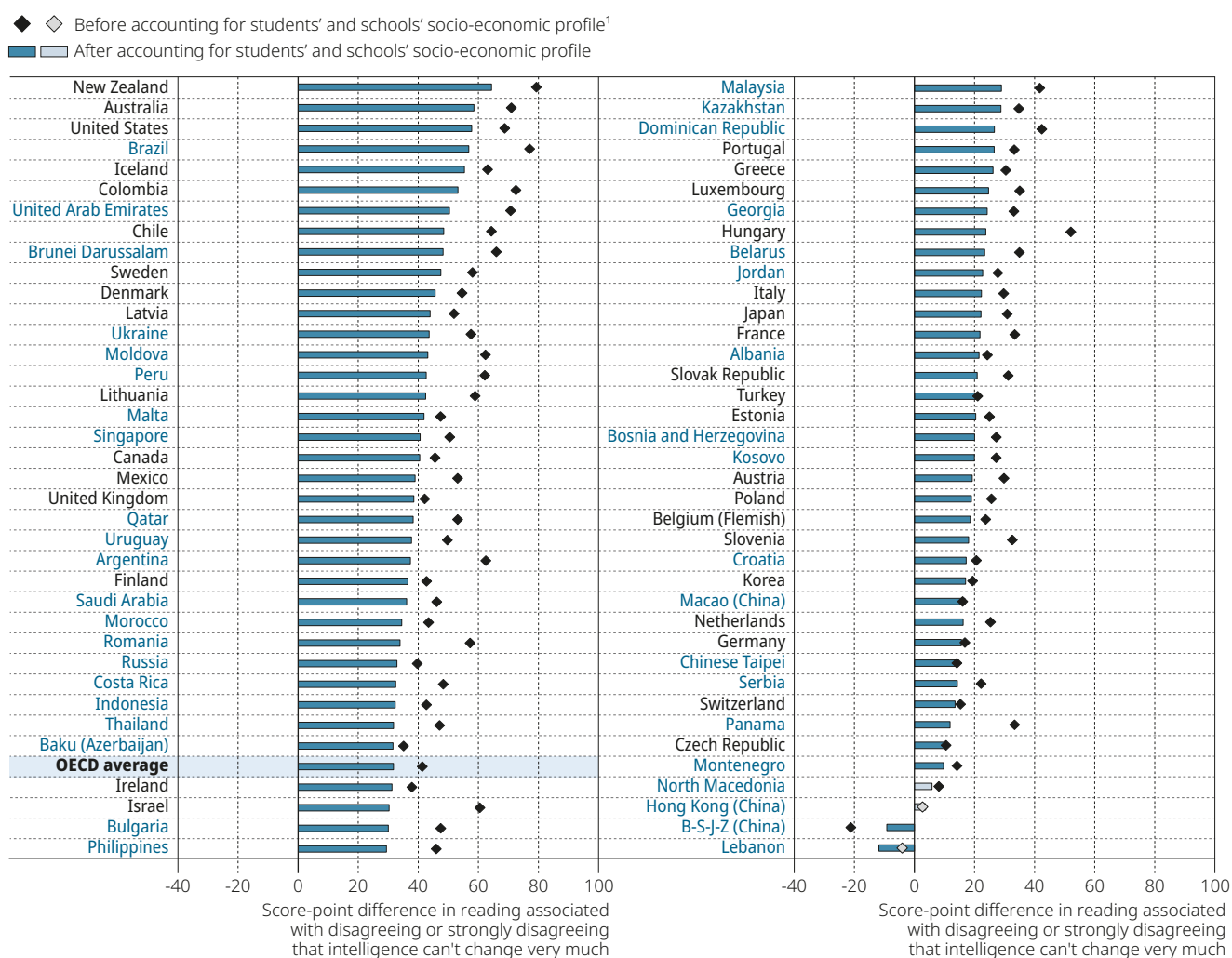
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HOW A GROWTH MINDSET IS RELATED TO READING PERFORMANCE

PISA findings support the idea that instilling a growth mindset in students could result in better academic performance (Blackwell, Trzesniewski and Dweck, 2007^[9]; McCutchen et al., 2016^[10]). On average across OECD countries, students who disagreed or strongly disagreed with the statement “Your intelligence is something about you that you can’t change very much” scored 41 points higher in reading than students who agreed or strongly agreed with the statement (Figure III.14.2). The former group of students scored 32 points higher than the latter group after accounting for the socio-economic profile of students and schools (as measured by the PISA index of economic, social and cultural status). In Australia, Brazil, Colombia, Iceland, New Zealand, the United Arab Emirates and the United States, students who disagreed that their intelligence is fixed scored at least 50 point higher than students who agreed with the statement. The only four school systems where holding a growth mindset was not positively associated with reading performance were B-S-J-Z (China), Hong Kong (China), Lebanon and North Macedonia. Interestingly, in East Asian countries, holding a growth mindset is not as strongly associated with academic performance as in most OECD countries. While, on average across OECD countries, students with a growth mindset scored 32 points higher in reading than students with a fixed mindset, the difference in scores between the two groups of students was 22 points in Japan, 17 points in Korea and Macao (China) and 15 points in Chinese Taipei. In addition, in Hong Kong (China), endorsing a growth mindset and reading performance were unrelated, and in B-S-J-Z (China), they were negatively associated.

Figure III.14.2 **Growth mindset and reading performance**



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 tones (see Annex A3).

Countries and economies are ranked in descending order of the score-point difference associated with disagreeing or strongly disagreeing that intelligence can't change very much, after accounting for students' and schools' socio-economic profile.

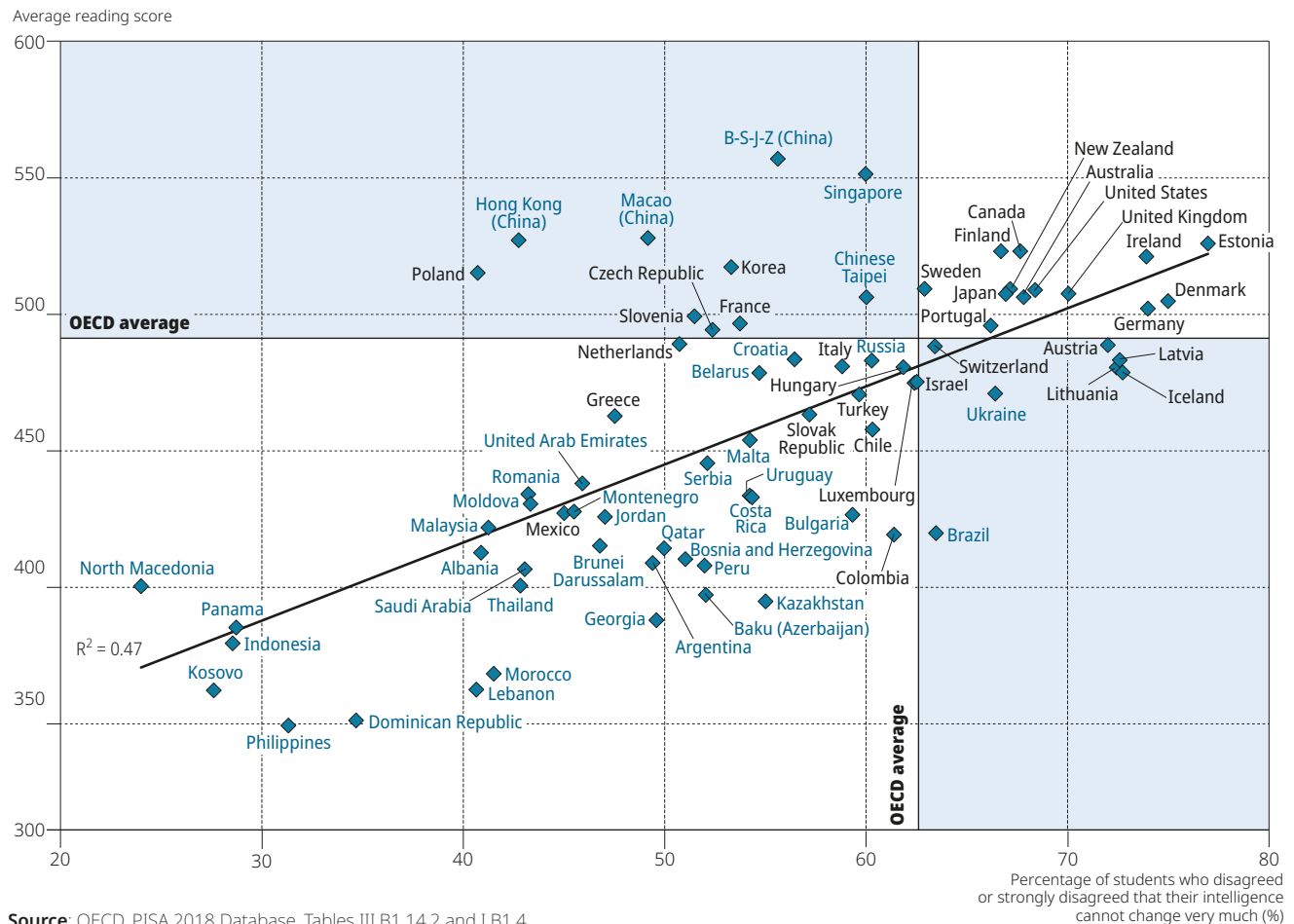
Source: OECD, PISA 2018 Database, Table III.B1.14.5.

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The share of students who disagreed or strongly disagreed with the statement about a fixed mindset was also positively associated with reading performance at the system level (Figure III.14.3). All the countries and economies where more than 70% of students disagreed with the statement showed an average reading performance of more than 470 score points. However, in several countries with a reading performance above the OECD average, namely B-S-J-Z (China), Hong Kong (China), Korea, Macao (China), Poland, Singapore and Chinese Taipei, the share of students with a growth mindset was comparatively small.

These findings would seem to support the theories of the numerous researchers cited above who maintain that instilling a growth mindset in students can result in stronger academic performance. However, PISA cannot prove cause and effect, and other interpretations are possible. For instance, holding a growth mindset could be the result of strong academic performance, rather than the other way around. For instance, high achievers are more likely to know – precisely because they are strong performers – that human intelligence is malleable. They are also more likely to be aware of how their intelligence has grown over time, and therefore they may be answering the PISA question based on their own experience.

Figure III.14.3 **Percentage of students with a growth mindset and average reading performance**



Source: OECD, PISA 2018 Database, Tables III.B1.14.2 and I.B1.4.
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HOW DOES THE RELATIONSHIPS BETWEEN GROWTH MINDSET AND READING PERFORMANCE VARY ACROSS STUDENT CHARACTERISTICS?

Researchers have widely documented the benefits of holding a growth mindset for all students, but especially for those struggling academically and those from disadvantaged backgrounds. Claro, Paunesku and Dweck (2016^[7]), for instance, show that endorsing a growth mindset is a stronger predictor of academic success amongst socio-economically disadvantaged Chilean students than amongst advantaged ones. In a study of 13 schools in the United States, Paunesku et al. (2015^[8]) also reveal that a brief growth-mindset intervention – consisting of a 45-minutes online session where students read an article describing the brain's ability to grow – was most beneficial to the sample of students who were at risk of dropping out of high school. Do PISA 2018 data show any differences in the association between endorsing a growth mindset and reading performance across different groups of students?

On average across OECD countries in 2018, the relationship between holding a growth mindset and reading performance was positive amongst all groups of students, but there were significant differences across groups of students (Figure III.14.4). For instance, the positive relationship was somewhat stronger amongst girls (a 42 score-point difference) than amongst boys (a 39 score-point difference). This result is consistent with a previous study that indicates that girls improved their mathematics performance more than boys did when they endorsed a growth mindset (Degol et al., 2018_[16]). The gender gap, in favour of girls, was particularly large in the Flemish Community of Belgium, Bulgaria, Denmark, Jordan, North Macedonia and Saudi Arabia (more than 20 score points), whereas the relationship was stronger amongst boys only in Colombia, Hong Kong (China) and Turkey (Table III.B1.14.6).

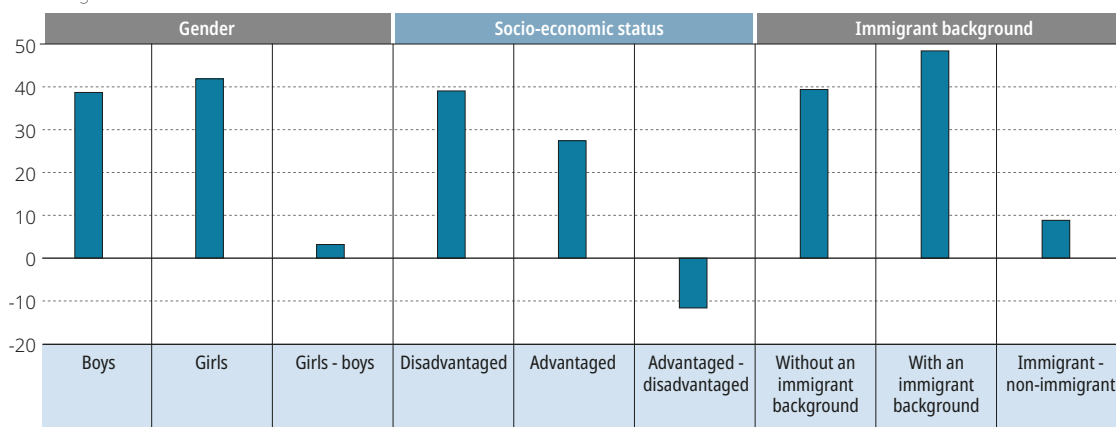
On average across OECD countries, the relationship between endorsing a growth mindset and reading performance was considerably stronger amongst socio-economically disadvantaged students (a 39 score-point difference) than amongst advantaged students (a 27 score-point difference). This result is consistent with findings reported in previous research (Claro, Paunesku and Dweck, 2016_[7]; Paunesku et al., 2015_[8]). The difference, in favour of disadvantaged students, was particularly large in Germany, Ireland, Italy, Singapore and Chinese Taipei, (more than 30 score points), whereas the gap in favour of advantaged students was the largest in Brunei Darussalam, the Dominican Republic, Panama, the Philippines, Qatar and the United Arab Emirates (more than 40 score points).

Across OECD countries, students with an immigrant background showed a stronger association (a 48 score-point difference) than students without an immigrant background (a 39 score-point difference) between endorsing a growth mindset and reading performance, on average. The countries and economies where the relationship between holding a growth mindset and reading performance was the strongest amongst immigrant students, compared to non-immigrant students, were Finland, Germany, Panama and Qatar (more than 20 score points). The only education system where the relationship was stronger amongst non-immigrant students was Israel.

Figure III.14.4 **Association between growth mindset and reading performance, by student characteristics**

OECD average


Score-point difference
in reading



Students who disagreed or strongly disagreed that "your intelligence is something about you that you can't change very much", by these groups of students

Note: All values are statistically significant (see Annex A3).

Source: OECD, PISA 2018 Database, Table III.B1.14.6.

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DO STUDENTS WITH A GROWTH MINDSET SHOW POSITIVE ATTITUDES?

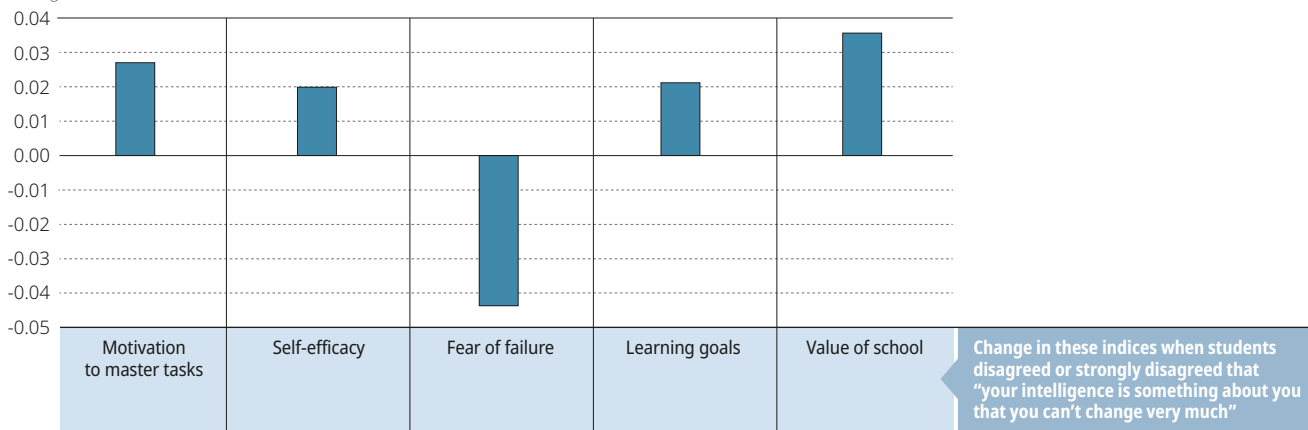
One of the most frequently cited arguments in favour of instilling a growth mindset in students is the positive effect it can have on their self-efficacy, motivation to learn and effort they invest in school activities (Blackwell, Trzesniewski and Dweck, 2007_[9]; McCutchen et al., 2016_[10]; Sriram, 2014_[11]). Self-efficacy is of particular importance, because of all the judgements people make about themselves, the most influential is how capable they think they are of completing a task successfully (Bandura, 2012_[17]). In this regard, previous research shows that when people believe that they are responsible for the results of their behaviour, and that this behaviour may lead to the results they are trying to achieve, they invest greater effort (Weiner, 2004_[18]). PISA 2018 asked students many questions about their general attitudes, including perseverance, self-efficacy, fear of failure, and their attitudes towards learning and school, such as their learning goals and the value they give to school.

PISA asked students to report the extent to which they agree with four statements about their motivation to master tasks in general, including “Once I start a task, I persist until it is finished” and “I find satisfaction in working as hard as I can”. Three of these statements were combined to create an index of motivation to master tasks (see Chapter 5 for more details). On average across OECD countries and in about half of the PISA-participating education systems, holding a growth mindset was positively associated with student motivation to master tasks, after accounting for the socio-economic profile of students and schools (Figure III.14.5 and Table III.B1.14.7). In only eight countries and economies – Baku (Azerbaijan), Belarus, the Dominican Republic, Kazakhstan, Lebanon, North Macedonia, Panama and the Philippines – did students who agreed with the fixed intelligence statement report greater motivation to master tasks than students who disagreed with the statement.

Figure III.14.5 Growth mindset and student attitudes

OECD average

Change in indices



Notes: All values are statistically significant (see Annex A3).

All linear regression models account for students’ and schools’ socio-economic profile. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

Source: OECD, PISA 2018 Database, Table III.B1.14.7.

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PISA also asked students the extent to which they agreed with five statements about their general self-efficacy (e.g. “I usually manage one way or another”) and three statements about their fear of failure (e.g. “When I am failing, I am afraid that I might not have enough talent”) (see Chapter 13 for more details). In 31 school systems, and markedly so in B-S-J-Z (China), Hong Kong (China), Ireland, Japan, Korea, Macao (China) and Chinese Taipei, students holding a growth mindset reported greater self-efficacy than students holding a fixed mindset. But in 20 countries and economies, all of whose average reading scores were below the OECD average in 2018, students with a fixed mindset were more likely to report a stronger belief in their general capabilities. The findings are clearer when considering students’ fear of failure: in every school system except the Flemish Community of Belgium and Germany, students holding a growth mindset reported less fear of failing than students with a fixed mindset.

Students who sat the PISA test were also asked about their attitudes towards learning and schooling. Specifically, PISA asked students how much they identified (“not at all true of me”, “slightly true of me”, “moderately true of me”, “very true of me”, “extremely true of me”) with the following statements about their (ambitious) learning goals: “My goal is to learn as much as possible”; “My goal is to completely master the material presented in my classes”; and “My goal is to understand the content of my classes as thoroughly as possible”. These statements were combined to create the index of learning goals whose average is 0 and standard deviation is 1 across OECD countries. PISA also asked students the extent to which they agreed with three statements about the value of schooling, including “Trying hard at school will help me get a good job” (see Chapter 4 for more details). Students who believe that their intelligence cannot change are expected to set less-ambitious goals for themselves, and to give less importance to schooling. After all, if students do not believe that their intelligence can grow, why should they care about the institution (i.e. the school) that can be viewed as best representing the idea of personal growth?

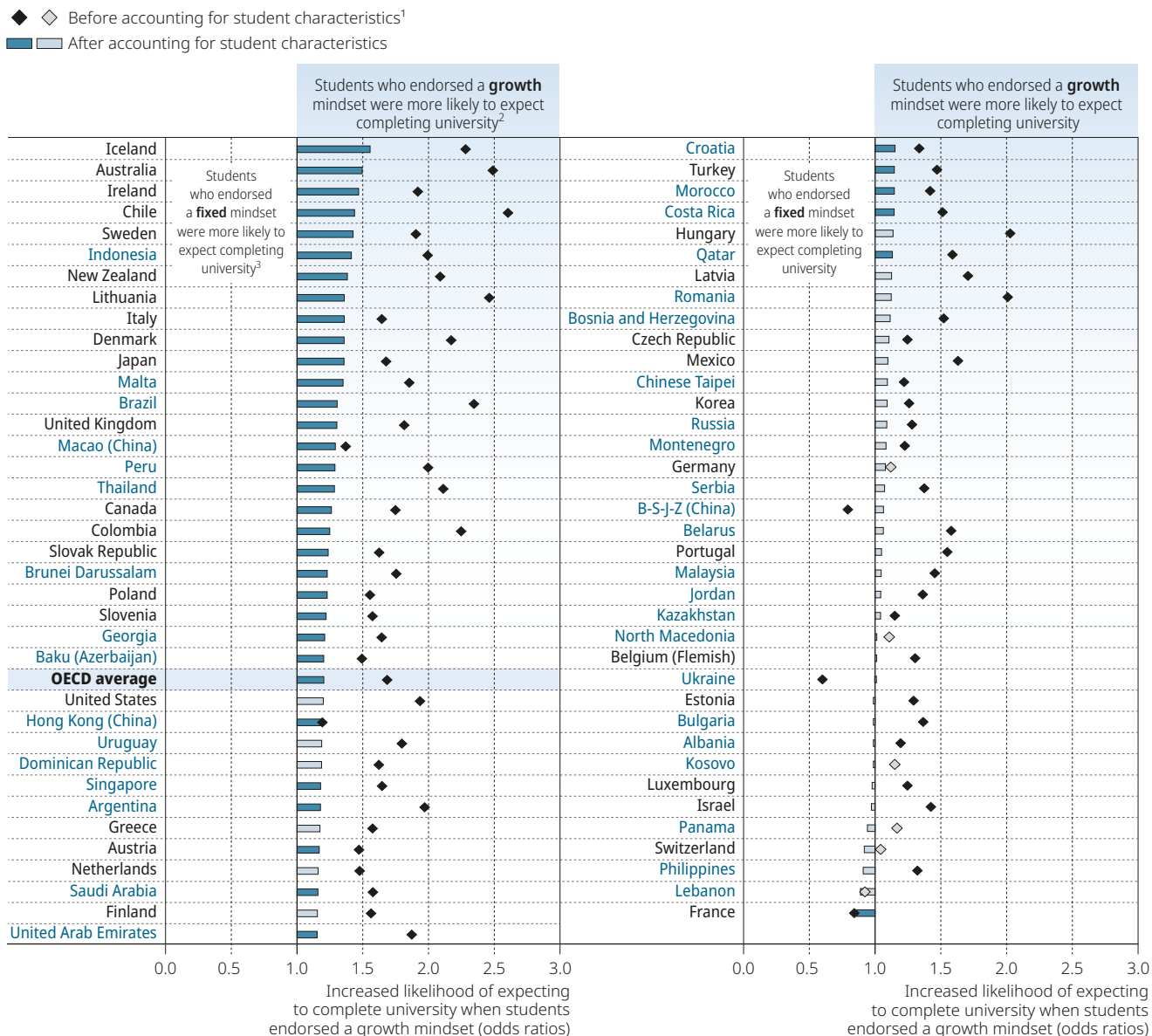
On average across OECD countries, students with a growth mindset reported more ambitious learning goals and attributed greater value to school than students with a fixed mindset. However, in 18 countries and economies – all of them with an average reading performance below the OECD average – students with a growth mindset reported less-ambitious learning goals than those with a fixed mindset. In Belarus and Moldova, students with a growth mindset valued school less than students with a fixed mindset did.



ARE STUDENTS WHO ENDORSE A GROWTH MINDSET MORE LIKELY TO EXPECT TO COMPLETE TERTIARY EDUCATION THAN STUDENTS HOLDING A FIXED MINDSET?

One of the best, if not the best, ways in which students who endorse a growth mindset can actually develop their intelligence is through education. By contrast, students who believe that their intelligence is fixed and cannot develop over time should be less interested in pursuing further studies. The results presented in Figure III.14.5 show that students holding a growth mindset establish more ambitious academic goals for themselves and ascribe greater importance to school than did students who endorsed a fixed mindset. Are students with a growth mindset also more likely to expect to complete tertiary education?

Figure III.14.6 Growth mindset and educational expectations



1. Student characteristics include socio-economic status, gender, immigrant background and reading performance. The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
 2. Students who endorsed a growth mindset are those who disagreed or strongly disagreed that “your intelligence is something about you that you can’t change very much”.
 3. Students who endorsed a fixed mindset are those who agreed or strongly agreed that “your intelligence is something about you that you can’t change very much”.

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

Countries and economies are ranked in descending order of the change in the likelihood of completing university associated with endorsing a growth mindset.

Source: OECD, PISA 2018 Database, Table III.B1.14.8.

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PISA asked students if they expect to complete tertiary education, including obtaining a bachelor's, master's or doctoral degree (ISCED 5A and 6). In every education system except B-S-J-Z (China), France, Germany, Kosovo, Lebanon, North Macedonia, Panama, Switzerland and Ukraine, students who endorsed a growth mindset were more likely to expect to complete higher education than did students holding a fixed mindset (Figure III.14.6). Even after accounting for students' socio-economic status, gender, immigrant background and reading performance, there were still 36 countries and economies where students who disagreed that their intelligence cannot change very much were more likely to expect to complete higher education than students who agreed with the statement. The only country where students were more likely to expect to complete tertiary education when they held a fixed mindset, after accounting for students' socio-demographic characteristics and reading performance, was France. The school systems with the strongest positive associations between endorsing a growth mindset and expectations of completing higher education were Australia, Chile, Iceland, Indonesia, Ireland and Sweden.

Note

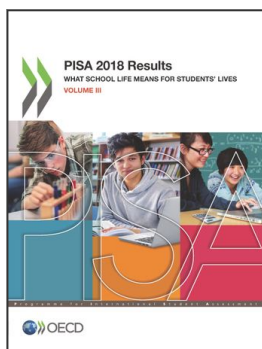
1. A large part of these country differences can be explained by the levels of individualism and respect for authority across PISA-participating countries and economies. Using Hofstede's six cultural dimensions (see www.hofstede-insights.com/product/compare-countries/, last accessed on 28/08/2019), the percentage of students who endorse a growth mindset (strongly disagreed or disagreed with the fixed mindset statement "Your intelligence is something about you that you can't change very much") is positively associated with the dimension of individualism, and negatively associated with the index of power distance (respect for authority). For the 56 countries and economies with available data, the Pearson correlation coefficients between the percentage of students who strongly disagreed or disagreed that "Your intelligence is something about you that you can't change very much" and Hofstede's dimensions of individualism and power distance (respect for authority) are 0.56 and -0.69, respectively. The correlations with Hofstede's dimensions of masculinity (-0.03), uncertainty avoidance (-0.17), long-term orientation (0.15) and indulgence (0.21) are weak or moderate.

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