

Can a growth mindset help disadvantaged students close the gap?

ANDREAS SCHLEICHER

Why do certain students thrive when facing adversity while others languish? According to Carol Dweck (2006), underlying beliefs about intelligence can affect learning motivation and students' performance. In the mindset theory, growth mindset is opposed to fixed mindset, and could explain why some people fulfil their potential and others do not. During the COVID pandemic, this became even more crucial. Students who were able to set their own learning goals, elaborate learning strategies, and master their progress could continue learning even when schools were closed. For other students used to being led in their learning and who have little taste for steering their learning on their own, the experience was often devastating.

HOW DOES GROWTH MINDSET RELATE TO ACADEMIC PERFORMANCE AND WELL-BEING IN PISA?

In its last assessment, PISA measured in 77 countries and economies growth mindset¹ for the first time. According to the concept of growth mindset, students with a fixed mindset believe their talents are innate gifts, and tend to attach more importance to validating their ability and avoiding challenges, as high effort and setbacks are seen as signalling low ability. On the contrary, students with a growth mindset consider ability to be malleable, and will strive to develop it by setting challenging learning goals. They consider effort an inherent part of the learning process and setbacks to be fruitful experiences to assimilate. Therefore, students with a growth mindset may outperform their fixed mindset peers, as they expend efforts to reach their full potential instead of remaining in their comfort zone. Students with a growth mindset may also experience heightened well-being, since their positive conception of failure and challenges potentially decrease anxiety (Dweck and Yeager, 2019).

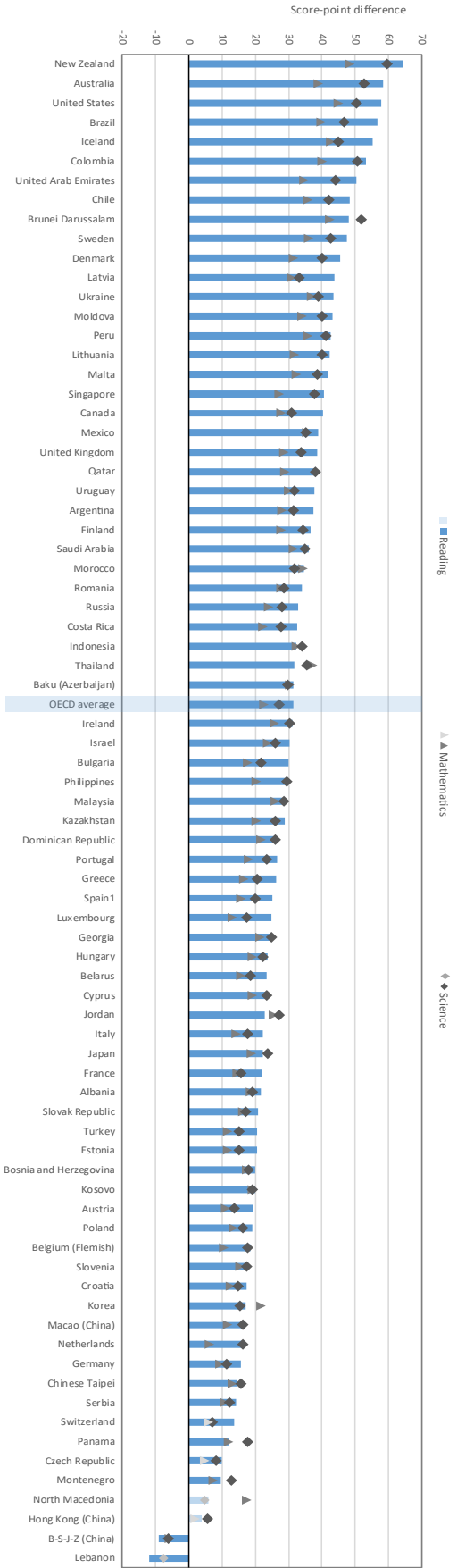
Students who reported having a growth mindset scored higher in reading in PISA in 73 out of 77 countries and

economies. The performance gap was the widest in New Zealand, Australia, and the United States where students with a growth mindset scored around 60 points higher in reading, 50 points higher in science, and 40 points higher in mathematics than their counterparts after accounting for the socio-economic profile of students and schools (Figure 1). In East Asian countries, growth mindset was not as highly associated with academic performance as in most OECD countries. In these countries, the dominant cultural ethos of working hard may attenuate the negative effects of a fixed mindset. For instance, in Japan, Korea, Macao (China), and Chinese Taipei, the average performance gain in reading was only 18 points, while it reaches 31 points on average across OECD countries. In Hong Kong (China), growth mindset and reading performance were unrelated, and even negatively associated in B-S-J-Z (China).

Students who reported having a growth mindset displayed a lower index of fear of failure² in 76 out of 77 countries and economies. This robust relationship holds after accounting for the socio-economic profile of students and schools, and corroborates the growth mindset theory, namely that students with a growth mindset are less afraid of setbacks. The difference in fear of failure is especially sharp in East Asian countries participating in PISA, and less pronounced for the three countries for instance –New Zealand, Australia, and the United States– with the widest performance gap between growth and fixed mindset students (Figure 2).

Students who reported having a growth mindset felt more satisfied³ with their life in 30 out of 70 countries and economies. In 18 additional countries, the change in life satisfaction associated with growth mindset was positive, but not significant (Figure 3). On average across OECD countries, a student with a growth mindset is more likely to consider his/her life satisfactory by 27 percentage points. In East Asian countries, this association reaches 49 percentage points at least. For instance in Korea, students with a growth mindset are more than twice more likely to feel satisfied with their life. In these

1 Growth mindset and performance in reading, mathematics and science



1. In 2018, some regions in Spain conducted their high-stakes exams for tenth-grade students earlier in the year than in the past, which resulted in the testing period for these exams coinciding with the end of the PISA testing window. Because of this overlap, a number of students were negatively disposed towards the PISA test and did not try their best to demonstrate their proficiency. Although the data of only a minority of students show clear signs of lack of engagement (see PISA 2018 Results Volume I, Annex A9), the comparability of PISA 2018 data for Spain with those from earlier PISA assessments cannot be fully ensured.

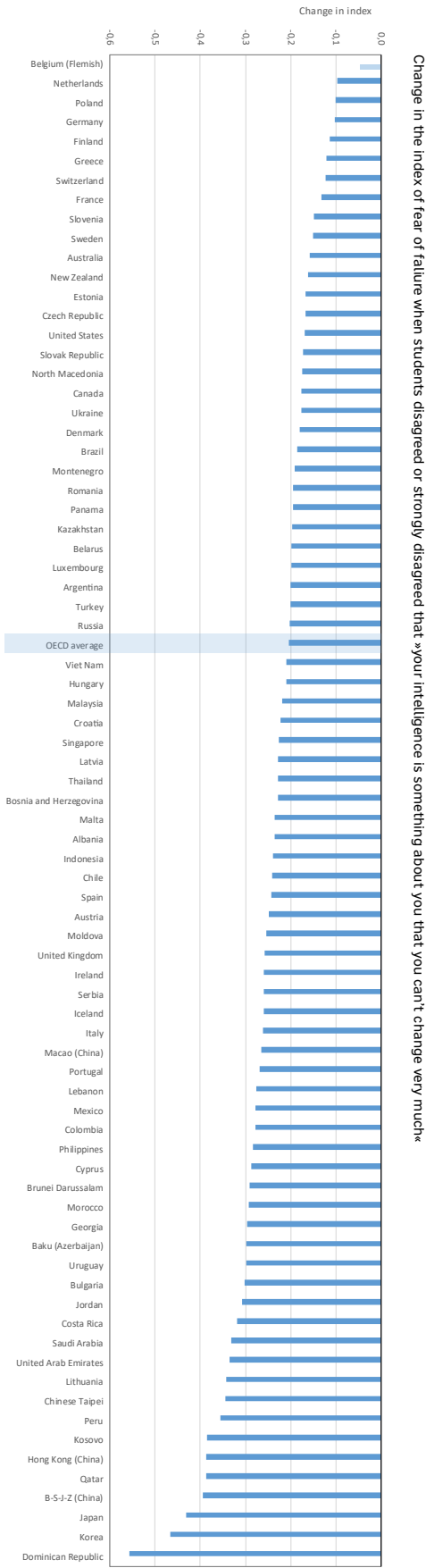
Note: Statistically significant values are shown in darker tones.

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). Countries and economies are ranked in descending order of the score-point difference in reading associated with disagreeing or strongly disagreeing that intelligence can't change very much*.

Source: OECD, PISA 2018 Database

Score-point difference in core domains associated with disagreeing or strongly disagreeing that intelligence can't change very much

2 Growth mindset and fear of failure



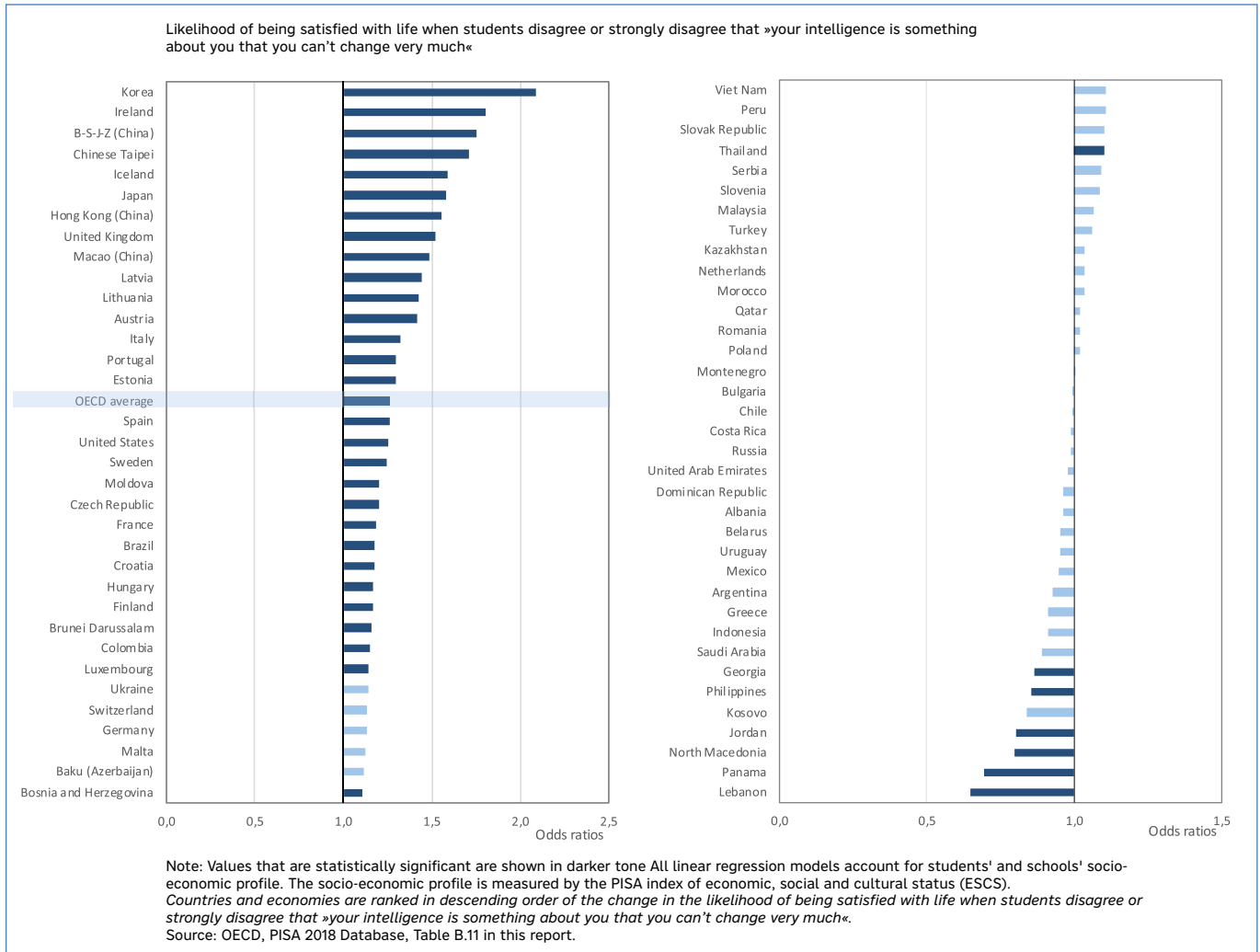
Change in the index of fear of failure when students disagree or strongly disagree that «your intelligence is something about you that you can't change very much»

Note: Statistically significant values are shown in darker tones.

All linear regression models account for students' and schools' socio-economic profiles. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS). Countries and economies are ranked in descending order of the change in the index of fear of failure associated with disagreeing or strongly disagreeing that intelligence can't change very much*.

Source: OECD, PISA 2018 Database

3 Growth mindset and evaluation of life satisfaction



countries, having a growth mindset is highly correlated with a lower fear of failure and higher evaluation of life satisfaction. These results suggest that growth mindset may also provides some psychological protection from life's challenges.

WHO BENEFIT THE MOST FROM HAVING A GROWTH MINDSET?

The analysis of PISA data sheds lights on a positive relationship between growth mindset and academic performance. But is this relationship constant, or does it vary across specific subgroups? In other words, is having a growth mindset associated with the same performance gain for different groups of students?

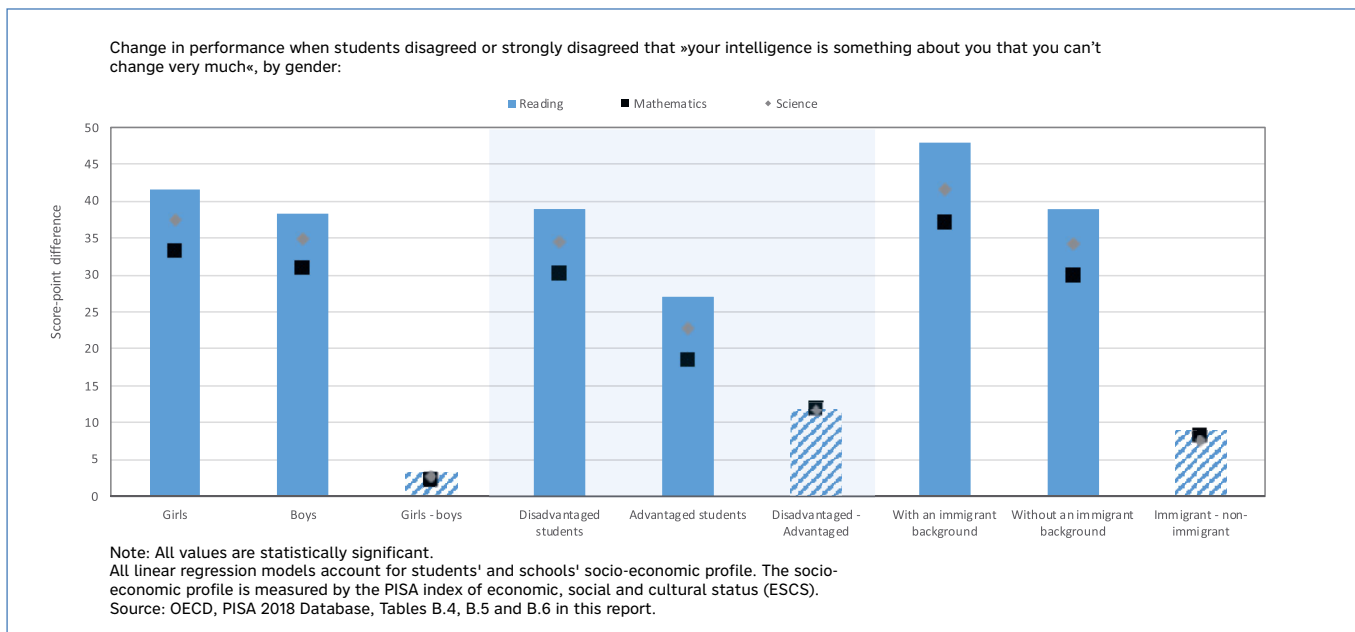
Interestingly, the results show that growth mindset is associated with a larger score gain for girls, and disadvantaged, and immigrant students when compared to boys, and advantaged and non-immigrant students. The performance gap in reading between students displaying or not a growth mindset was wider on average for girls (a 42 score-point difference) than for boys (a 39 score-point difference). This average gap of 3 points across OECD countries is statistically significant. Similarly, the average growth mindset related performance gap

reached 12 points in reading between disadvantaged and advantaged students, and 9 points in reading between immigrant and non-immigrant students (Figure 4).

Teaching growth mindset in schools has therefore the potential to buffer the negative effects of biased perceptions, curbed aspirations, and economic deprivation on students' academic achievement. The interaction between growth mindset and gender has been advanced to explain outcome differences in science, technology, engineering, and mathematics (STEM) fields. It has been proposed that females are more vulnerable to the detrimental effects of a fixed mindset in mathematical ability (Dweck, 2007; Good, Rattan and Dweck, 2012). Growth mindset may help curb self-defeating thoughts, and correct biased perceptions about math abilities that operate as a barrier to performance for many female students (Degol et al., 2018). In addition, it has been found that mindset could be a stronger predictor of academic success than available resources for low-income students (Claro, Paunesku and Dweck, 2016), and that growth mindset intervention was the most beneficial to students at risk of dropping out (Paunesku et al., 2015).

Growth mindset interventions can contribute to equity. The fact that growth mindset has larger pay-offs for vulnera-

4 Association between growth mindset and performance, by student characteristics



ble students who are at the greatest risk of poor performance (Burnette et al., 2013; Dweck and Yeager, 2019; Yeager and Dweck, 2020) opens an avenue for designing policies and interventions promoting equity and bridging the performance gap between different groups of students. The identification and targeting of vulnerable subgroups such as lower performers, socio-economically disadvantaged students, and female students in STEM fields, is likely to boost the efficiency of such policies and interventions.

CONCLUSION

On average in PISA, students who reported having a growth mindset scored higher in reading, mathematics, and science, displayed lower levels of fear of failure, and are more likely to consider their life satisfactory. In addition, PISA data reveal that growth mindset is associated with a larger score gain for girls, and disadvantaged, and immigrant students when compared to boys, and advantaged and non-immigrant students. Teaching growth mindset in schools has therefore the potential to buffer the negative effects of biased perceptions, curbed aspirations, and economic deprivation on students' academic achievement. These larger pay-offs for vulnerable students who are at the greatest risk of poor performance opens an avenue for designing policies and interventions promoting equity and bridging the performance gap between different groups of students. ♦

NOTES

¹PISA 2018 asked students whether they agreed (»strongly disagree«, »disagree«, »agree«, or »strongly agree«) with the following statement: »Your intelligence is something about you that you can't change very much«. Disagreeing with the statement is considered a precursor of a growth mindset, as it is more likely that someone who thinks intelligence can change will challenge him/herself to improve it.
²The index of fear of failure in PISA summarises students responses

to the following questions: »When I am failing, I worry about what others think of me«, »When I am failing, I am afraid that I might not have enough talent«, and »When I am failing, this makes me doubt my plans for the future«.

³One of the measures of subjective well-being in PISA consists of the life evaluation scale where students are asked to rate their life satisfaction on a scale from 0 (not at all satisfied) to 10 (completely satisfied). A student is considered as »satisfied« if he/she evaluated his life satisfaction between 7 and 10.

REFERENCES

- Burnette, J. et al. (2013), »Mind-sets matter: A meta-analytic review of implicit theories and self-regulation.«, *Psychological Bulletin*, Vol. 139/3, pp. 655-701, <http://dx.doi.org/10.1037/a0029531>.
- Claro, S., D. Paunesku and C. Dweck (2016), »Growth mindset tempers the effects of poverty on academic achievement«, *Proceedings of the National Academy of Sciences*, Vol. 113/31, pp. 8664-8668, <http://dx.doi.org/10.1073/pnas.1608207113>.
- Degol, J. et al. (2018), »Do Growth Mindsets in Math Benefit Females? Identifying Pathways between Gender, Mindset, and Motivation«, *Journal of Youth and Adolescence*, Vol. 47/5, pp. 976-990, <http://dx.doi.org/10.1007/s10964-017-0739-8>.
- Dweck, C. (2007), »Is math a gift? Beliefs that put females at risk«, in Ceci, S. and W. Williams (eds.), *Why aren't more women in science? Top researchers debate the evidence*, Washington: APA Press, <http://www.ms.uky.edu/~ma113/s.17/cdweckmath-gift.pdf>.
- Dweck, C. (2006), *Mindset*, Random House, New York, NY.
- Good, C., A. Rattan and C. Dweck (2012), »Why do women opt out? Sense of belonging and women's representation in mathematics.«, *Journal of Personality and Social Psychology*, Vol. 102/4, pp. 700-717, <http://dx.doi.org/10.1037/a0026659>.
- Paunesku, D. et al. (2015), »Mind-Set Interventions Are a Scalable Treatment for Academic Underachievement«, *Psychological Science*, Vol. 26/6, pp. 784-793, <http://dx.doi.org/10.1177/0956797615571017>.
- Yeager, D. and C. Dweck (2020), »What can be learned from growth mindset controversies?«, *American Psychologist*, Vol. 75/9, pp. 1269-1284, <http://dx.doi.org/10.1037/amp0000794>.