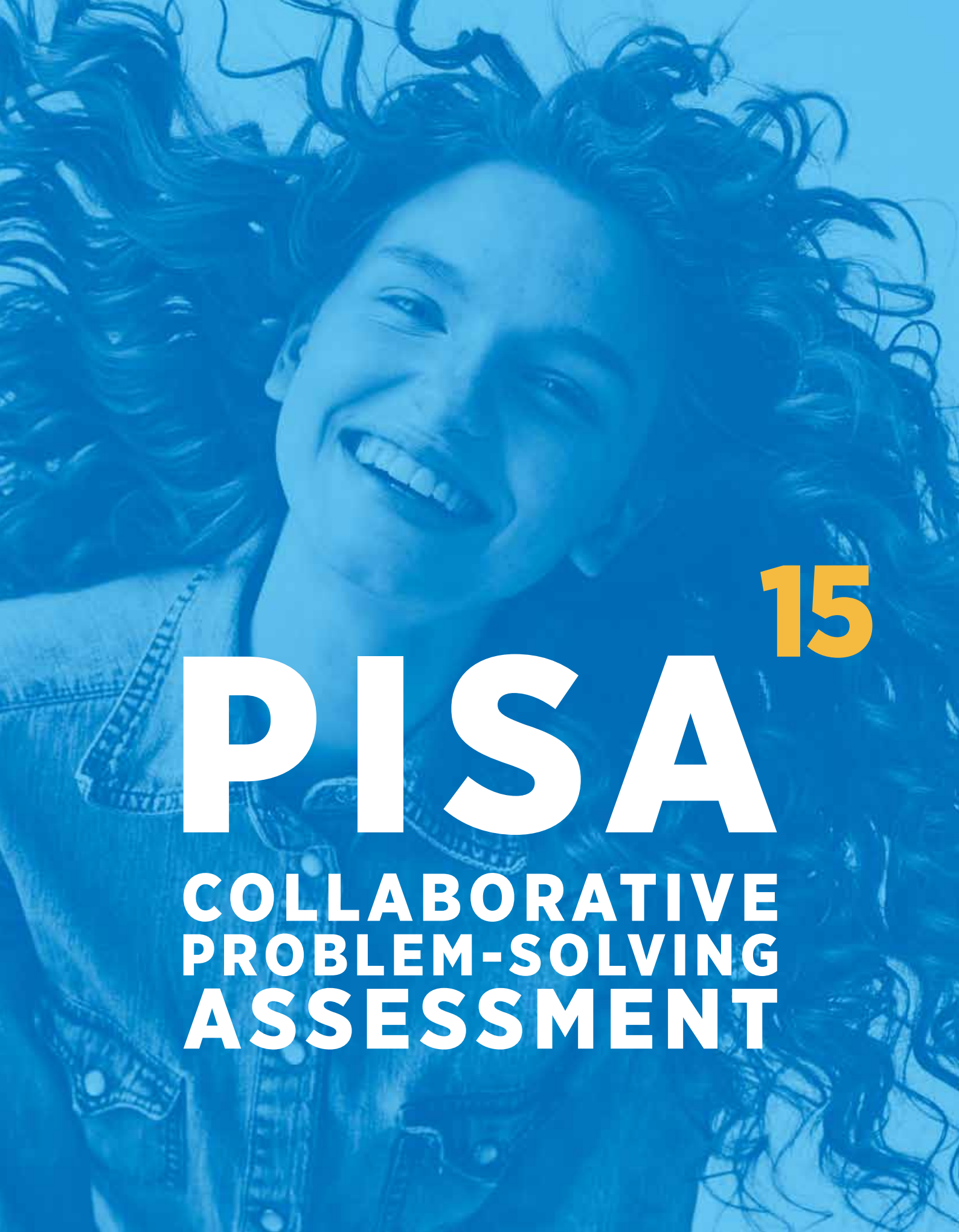
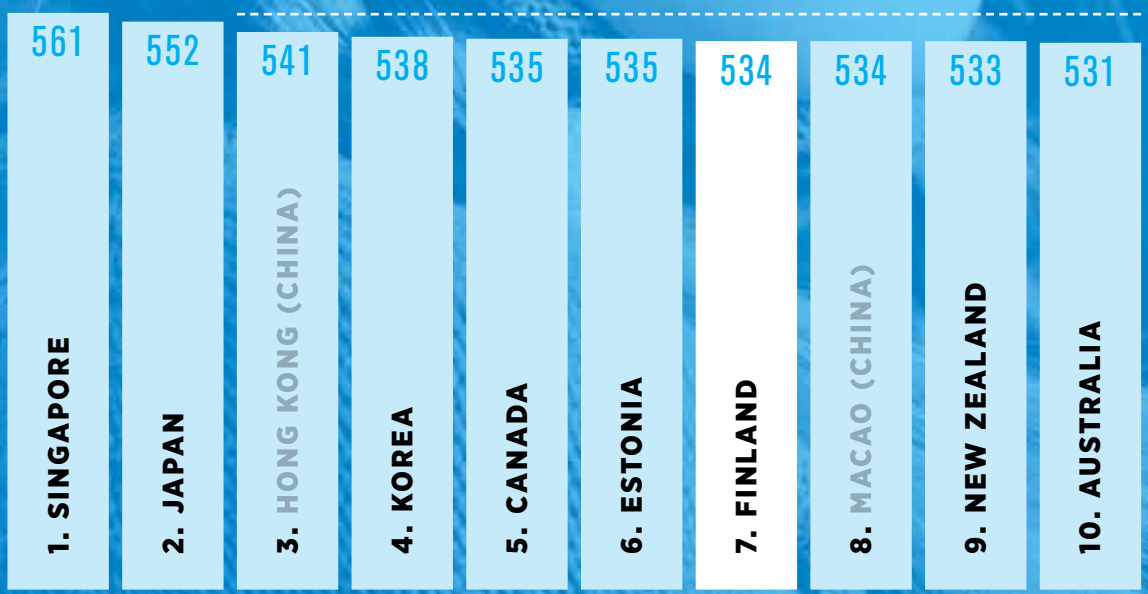


PISA 15

COLLABORATIVE PROBLEM-SOLVING ASSESSMENT

Differences between schools and impact of family background were the smallest in collaborative problem-solving in Finland.

AVERAGE SCORES IN TOP TEN COUNTRIES
RANKS 3 TO 10 NOT STATISTICALLY SIGNIFICANT RELATIVE TO FINLAND



FINNISH STUDENTS ONE OF THE BEST

Of the 73 countries and economies that participated in the PISA2015 survey, 51 also took part in ***a collaborative problem-solving assessment****.*

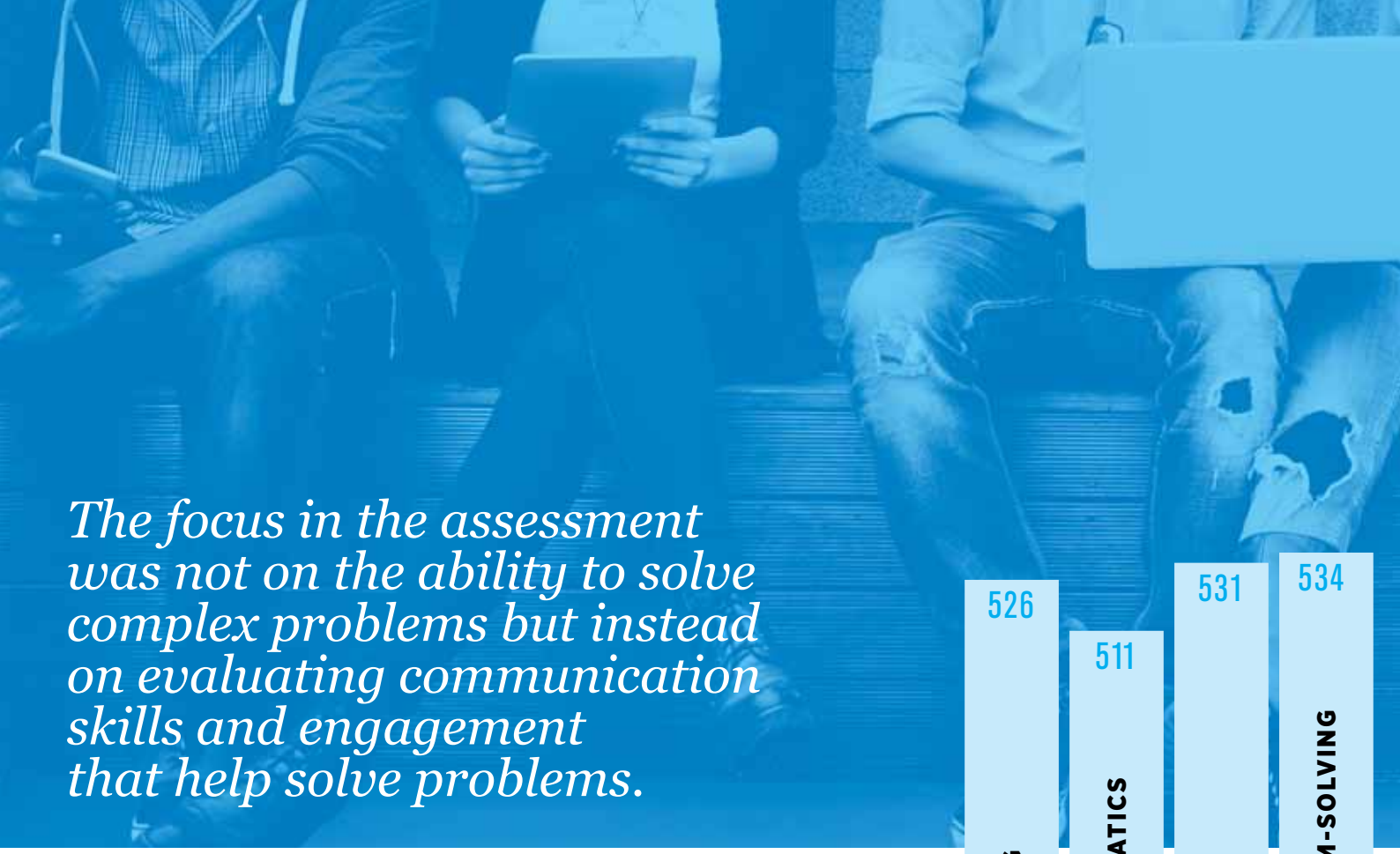
The average score points for Finnish students amounted to 534 points, which was the seventh highest among all the countries and economies that took part in the assessment.

Only the average score points of Singapore (561 points) and Japan (552) were statistically significant figures.

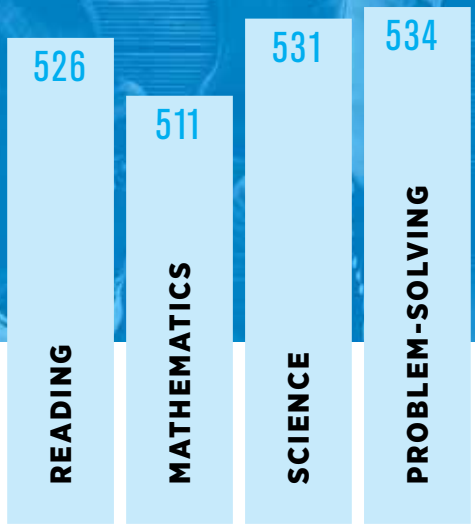
The average score points for students in Hong Kong (541), Korea (538), Canada (535), Estonia (535), Macao (534), New Zealand (533) and Australia (531), were in the same category as Finland, and no statistically significant difference was found between them and the average score for Finnish students.

With their nearly identical score points, Estonia and Finland were the only European countries that ranked among the top ten.

Of the other Nordic countries, Denmark (520) ranked statistically significantly above the OECD average whereas Iceland (499), Norway (502) and Sweden (510) were close to the OECD average.



The focus in the assessment was not on the ability to solve complex problems but instead on evaluating communication skills and engagement that help solve problems.



THE PISA 2015 survey tested not only skills and knowledge in mathematics, reading and science but also the collaborative problem-solving skills of students for the first time. The students performed this assessment interactively in a digital environment, where they communicated, using chat windows, with computer agents representing one or more students. A finite number of predefined options to take the floor were available for the students to choose from, and the scoring of the tasks was based mainly on how well the test-taker was able to choose the options that best supported collaboration constructively. Although the tasks included visual problem-solving elements, the solving of the problems was based mainly on reading and engaging in chats. In fact, reading skills played a far more pronounced role in how well the test-takers performed in this task than was the case in the earlier problem-solving assessment of 2012. The main focus in the 2012 problem-solving assessment was on the ability to solve complex problems. Because the two assessments are so different, the results of the 2015 problem-solving assessment cannot be compared with those of the 2012 assessment.

FINLAND RANKS AMONG THE BEST

Finnish 15-year-old students were very proficient in tasks assessing collaborative problem-solving skills compared with other European countries, with the exception of Estonia, which performed equally well as Finland. The one-point difference between Finland and Estonia was not statistically significant, but in Estonia there were fewer students in the lowest pass level or below it than in Finland. Compared with most other countries, though, Finland ranks well even in the light of the different performance levels.

When comparing the results with the performance of Finnish students in the core domains (reading, mathematics, science) in the PISA 2015 survey, it can be seen that the collaborative problem-solving skills of Finnish students are the strongest area of proficiency in relative terms.

MINIMAL DIFFERENCES IN SCHOOLS AND SOCIO-ECONOMIC BACKGROUND

The PISA 2015 outcomes in the core domains showed that there are growing disparities between schools in Finland. However, this was not the case in the context of collaborative problem-solving skills, as differences between schools were the second smallest in Finland after Iceland. Variance was small in the rest of the Nordic countries too, where the proportion of variance of the results ranged from 9 to 14%. In the case of other high-performing countries, how-

More on the PISA survey and results at:
www.minedu.fi/en/pisa-en
www.oecd.org/pisa

ever, the differences between schools were clearly wider than in Finland. In terms of promoting collaborative skills, the equity of the Finnish school system is reflected in the outcomes related to the impact of socio-economic background. While a link between socio-economic background and the outcomes was observed in Finland too, the proportion of variance in the collaborative problem-solving results was much more moderate than in the rest of the best-performing countries. Among the top ten, only the socio-economic background of students in Macao accounted for less of the variance in the results than in Finland.

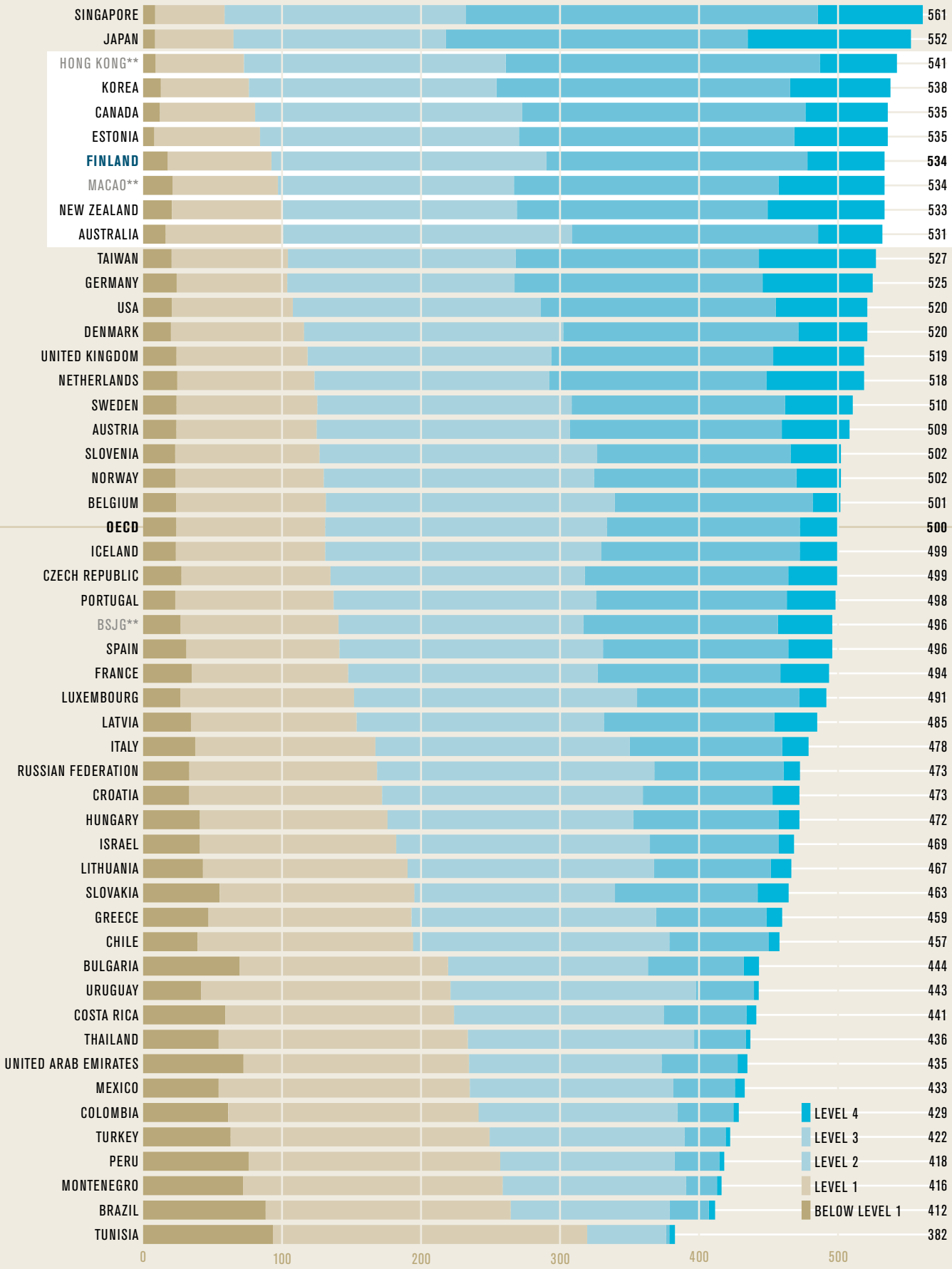
The PISA2015 survey covering the three core domains (reading, mathematics and science) showed regional differences in performance in Finland for the first time ever. However, the differences in the area of collaborative problem-solving were much smaller than in the other domains and were for the most part not statistically significant. Finnish-speaking schools performed better in the assessment than did Swedish-speaking ones. The difference is probably accounted for by the fact that reading proficiency is instrumental in the assessment of collaborative problem solving. The result is in line with earlier observations about the differences between Finnish-speaking and Swedish-speaking schools.

Students with an immigrant background did not perform as well in the tasks as those with a Finnish background. However, with their score points of 447 points and 468 points respectively, first- and second-generation immigrants did not differ in any statistically significant way.

WORLD'S BIGGEST GENDER GAP

While the results for collaborative problem-solving skills generally reflect positively on the equity of the Finnish educational system in promoting collaborative competencies, regrettably the results also reaffirm the main concerns expressed over the past few years. Even though girls performed uniformly better than boys around the world, nowhere was the gap in performance between boys and girls as wide as in Finland. The average difference in performance between boys and girls was 29 points while in Finland it was 48 points. The global gender difference observed in collaborative problem-solving skills is doubtless partly explained by the fact that many of the tasks involved chats, which might be a more typical pastime for girls than for boys. There was also a strong emphasis on literacy in the tasks, and Finnish girls have performed much better than Finnish boys in reading ever since the first round of the PISA survey. The average performance level of Finnish boys was a little over the OECD average, but the gap between boys and girls in reading and collaborative skills is now so wide that it needs to be taken into account in educational development work.

AVERAGE SCORES | BREAKDOWN INTO PERFORMANCE LEVELS*



*RELATIVE PROPORTION WITHIN EACH COUNTRY. THE FIGURES BETWEEN DIFFERENT COUNTRIES ARE NOT COMPARABLE | **CHINA, PSJG = BEIJING, SHANGHAI, JIANGSU, GUANGDONG

DIFFERENCES BETWEEN SCHOOLS

SINGAPORE	23.7%
JAPAN	28.3%
HONG KONG (CHINA)	24.3%
KOREA	21.0%
CANADA	14.3%
ESTONIA	17.8%
FINLAND	6,3 %
MACAO (CHINA)	21.5%
NEW ZEALAND	13.3%
AUSTRALIA	17.2%

PROPORTION OF VARIANCE OF THE RESULTS
TOP TEN COUNTRIES

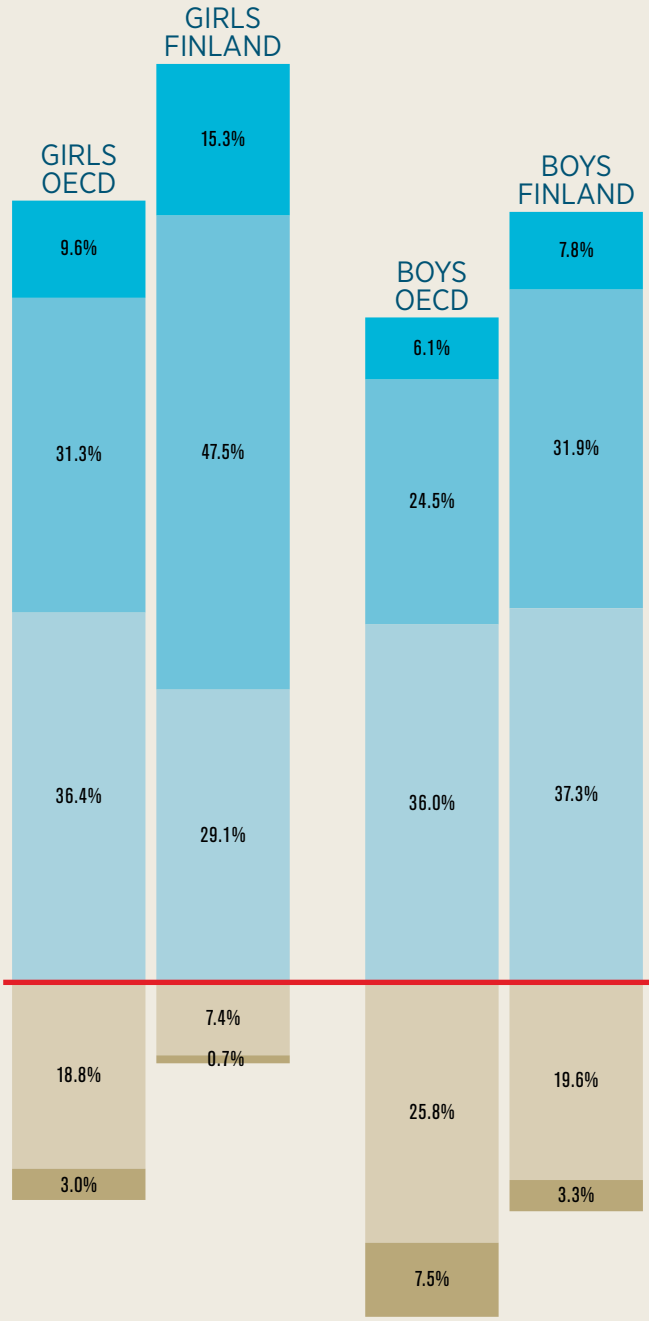
OECD 24.6%

IMPACT OF SOCIO-ECONOMIC BACKGROUND

SINGAPORE	16.3%
JAPAN	13.7%
HONG KONG (CHINA)	7.3%
KOREA	10.8%
CANADA	7.1%
ESTONIA	8.2%
FINLAND	6.2%
MACAO (CHINA)	0.9%
NEW ZEALAND	10.0%
AUSTRALIA	9.6%

PROPORTION OF VARIANCE OF THE RESULTS
TOP TEN COUNTRIES

OECD 15.2%



AVERAGES FOR BOYS AND GIRLS

GIRLS FINLAND	559
GIRLS OECD	515
BOYS FINLAND	511
BOYS OECD	486

PERFORMANCE DIFFERENCES BETWEEN BOYS AND GIRLS

SINGAPORE	20
JAPAN	26
HONG KONG (CHINA)	36
KOREA	33
CANADA	39
ESTONIA	27
FINLAND	48
MACAO (CHINA)	38
NEW ZEALAND	41
AUSTRALIA	41

GIRLS' SCORE POINT ADVANTAGE
TOP TEN COUNTRIES

OECD 29

BREAKDOWN INTO PERFORMANCE LEVELS

LEVEL 4 LEVEL 3 LEVEL 2 LEVEL 1 BELOW LEVEL 1

MATRIX OF COLLABORATIVE PROBLEM-SOLVING SKILLS

PROBLEM-SOLVING PROCESSES	COLLABORATIVE SKILLS		
	1 ESTABLISHING AND MAINTAINING SHARED UNDERSTANDING	**2** TAKING APPROPRIATE ACTION TO SOLVE THE PROBLEM	**3** ESTABLISHING AND MAINTAINING TEAM ORGANISATION
A EXPLORING AND UNDERSTANDING	**A1** Discovering perspectives and abilities of team members	**A2** Discovering the type of collaborative interaction to solve the problem, along with goals	**A3** Understanding roles to solve the problem
B REPRESENTING AND FORMULATING	**B1** Building a shared representation and negotiating the meaning of the problem (common ground)	**B2** Identifying and describing tasks to be completed	**B3** Describe roles and team organisation (communication protocol/rules of engagement)
C PLANNING AND EXECUTING	**C1** Communicating with team members about the actions to be/being performed	**C2** Enacting plans	**C3** Following rules of engagement, (e.g. prompting other team members to perform their tasks)
D MONITORING AND REFLECTING	**D1** Monitoring and repairing the shared understanding	**D2** Monitoring results of actions and evaluating success in solving the problem	**D3** Monitoring, providing feedback and adapting the team organisation and roles

LAYOUT: AHOY

BROAD-BASED COMPETENCES

The goals for broad-based competences outlined in the 2015 national core curriculum are manifested in the collaborative problem-solving tasks. By assessing interaction that promotes problem solving and by means of the three core domains in the PISA assessment, it is possible to evaluate not only ICT skills but also the ability to think, learning to learn skills, cultural competencies, everyday knowledge, multi-literacy and engagement.

The scoring for interaction and communication in the tasks in this study focussed strongly on collaborative communication and cultural understanding of the overall context. Thus the results can also be seen to assess the goals of the new core curriculum, the key competences set by the European Union and the 21st century skills raised in international discourse. In this light, it would seem Finland is well equipped for the future labour market.

The capacity of an individual to effectively engage in a process whereby two or more agents attempt to solve a problem by sharing the understanding and effort required to come to a solution and pooling their knowledge, skills and efforts to reach that solution.

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