



5

Students' attitudes towards collaboration

This chapter describes responses to the student questionnaire, in which students were asked about eight facets of their attitudes towards collaboration. The chapter then looks at differences in these attitudes between different groups of students, and the relationship between attitudes towards collaboration and other attitudes towards learning and school discussed in *PISA 2015 Results (Volume III): Students' Well-Being* (OECD, 2017). It concludes by examining the relationship between attitudes towards collaboration and performance in the PISA 2015 collaborative problem-solving assessment.



Do students enjoy working with other students? Do they listen well to others? If students will be increasingly required to collaborate and co-operate with others in order to achieve goals in their professional and personal lives, then schools can help students develop not just the interpersonal skills needed to work together, but also positive attitudes towards collaboration.

What the data tell us

- Students in every country and economy have generally positive attitudes towards collaboration. Over 85% of students, on average across OECD countries, agree with the statements “I am a good listener”, “I enjoy seeing my classmates be successful”, “I take into account what others are interested in”, “I enjoy considering different perspectives”, and “I enjoy co-operating with peers”.
- Girls in almost every country and economy tend to value relationships more than boys, while boys in a majority of countries and economies tend to value teamwork more than girls.
- Advantaged students in almost every country and economy tend to value relationships more than disadvantaged students, while disadvantaged students in most countries and economies tend to value teamwork more than advantaged students.
- Attitudes towards collaborative problem solving are generally positively but weakly correlated with indices of well-being.
- Students who value relationships tend to perform higher in the collaborative problem-solving assessment, while students who value teamwork tend to perform worse. However, once performance in the science, reading and mathematics assessments, gender, and students’ and schools’ socio-economic profile is accounted for, both students who value relationships and students who value teamwork tend to perform better in collaborative problem solving.

ATTITUDES TOWARDS COLLABORATION

The PISA 2015 student questionnaire asks students whether they strongly agree, agree, disagree, or strongly disagree with eight statements related to their attitudes towards collaboration:

- I prefer working as part of a team to working alone.
- I am a good listener.
- I enjoy seeing my classmates be successful.
- I take into account what others are interested in.
- I find that teams make better decisions than individuals.
- I enjoy considering different perspectives.
- I find that teamwork raises my own efficiency.
- I enjoy co-operating with peers.

On average across OECD countries, the percentage of students who reported that they agree or strongly agree with these statements ranges from 67% for “I prefer working as part of a team to working alone” and 70% for “I find that teamwork raises my own efficiency” to 87% for “I am a good listener,” “I enjoy considering different perspectives”, and “I enjoy co-operating with peers”, and 88% for “I enjoy seeing my classmates be successful” (Figure V.5.1). It is not possible to determine the extent to which these responses reflect whether students actually hold these attitudes towards collaboration or whether they act accordingly in real life.

In almost all OECD and partner countries and economies, the majority of students reported that they either agree or strongly agree with these statements. In fact, there are only two exceptions: only 48% of students in Turkey and 44% of students in Montenegro reported that they agree or strongly agree with the statement “I prefer working as part of a team to working alone”. However, in Korea, 95% of students reported that they agree or strongly agree that “[they are] a good listener”; in Portugal, Thailand and Uruguay, over 95% of students agreed or strongly agreed that “[they] enjoy seeing [their] classmates be successful”; in Singapore, 95% of students agreed or strongly agreed that “[they] enjoy considering different perspectives”; and in Thailand, 96% of students agreed or strongly agreed that “[they] enjoy co-operating with peers”.



Figure V.5.1 ■ Attitudes towards collaboration

		Percentage of students who agreed/strongly agreed with the following statements							
		Items comprising the index of valuing relationships				Items comprising the index of valuing teamwork			
		I am a good listener	I enjoy seeing my classmates be successful	I take into account what others are interested in	I enjoy considering different perspectives	I prefer working as part of a team to working alone	I find that teams make better decisions than individuals	I find that teamwork raises my own efficiency	I enjoy co-operating with peers
OECD	Australia	88	92	91	91	66	74	72	89
	Austria	89	83	88	81	69	75	67	87
	Belgium	85	91	86	89	66	71	63	85
	Canada	89	90	89	90	67	72	70	87
	Chile	87	90	80	90	72	75	81	93
	Czech Republic	92	78	86	86	72	76	67	89
	Denmark	91	91	86	89	65	67	61	90
	Estonia	88	89	92	87	62	72	71	81
	Finland	91	86	92	79	63	72	60	83
	France	86	87	83	88	71	72	76	85
	Germany	90	82	89	81	66	72	65	92
	Greece	85	90	87	91	72	83	76	89
	Hungary	84	87	85	88	74	77	67	86
	Iceland	82	87	79	89	58	63	65	87
	Ireland	85	93	89	89	68	74	72	88
	Israel	92	91	88	83	64	73	64	88
	Italy	85	85	78	91	71	74	71	88
	Japan	77	86	78	67	66	80	54	89
	Korea	95	82	89	91	76	83	84	87
	Latvia	81	84	81	82	69	71	66	82
	Luxembourg	86	84	84	83	68	71	67	85
	Mexico	89	93	84	93	70	82	83	90
	Netherlands	89	91	94	81	64	63	68	84
	New Zealand	83	91	89	90	70	76	73	90
	Norway	88	88	92	89	60	66	56	84
	Poland	88	83	79	88	74	71	69	85
	Portugal	93	96	93	94	72	83	81	95
	Slovak Republic	78	78	84	83	72	74	70	81
	Slovenia	82	92	90	84	69	75	71	89
	Spain	93	90	85	92	67	75	72	93
	Sweden	87	87	90	86	58	63	67	83
	Switzerland	87	88	88	86	73	76	72	91
	Turkey	86	83	76	88	48	71	79	81
United Kingdom	87	89	88	87	68	74	72	86	
United States	90	93	86	91	69	75	74	87	
	OECD average	87	88	86	87	67	73	70	87
Partners	Brazil	84	94	84	87	71	80	83	94
	B-S-J-G (China)	87	89	89	91	87	86	89	93
	Bulgaria	88	87	80	89	67	73	74	82
	Colombia	90	93	79	84	68	83	77	94
	Costa Rica	89	95	84	94	71	82	78	93
	Croatia	93	92	77	87	76	81	79	90
	Dominican Republic	88	90	84	83	74	82	82	94
	Hong Kong (China)	90	85	90	92	71	80	77	84
	Lithuania	86	85	77	88	73	79	80	86
	Macao (China)	84	85	86	89	69	74	80	84
	Montenegro	83	95	81	84	44	76	74	90
	Peru	90	85	78	91	68	79	77	91
	Qatar	85	92	75	87	62	80	83	88
	Russia	91	78	84	82	72	68	70	80
	Singapore	92	91	92	95	73	82	80	92
	Chinese Taipei	92	91	92	93	85	84	85	91
	Thailand	90	98	93	89	83	91	87	96
	Tunisia	89	94	74	87	78	84	86	92
	United Arab Emirates	88	93	86	91	69	87	86	91
	Uruguay	84	96	82	90	70	80	75	93

Source: OECD, PISA 2015 Database, Table V.5.1.

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Students' responses to these eight statements are positively correlated to one another (Figure V.5.2). The highest correlations are observed between the statement "I find that teamwork raises my own efficiency" and the following three statements: "I prefer working as part of a team to working alone" (0.43 across OECD countries), "I find that teams make better decisions than individuals" (0.39 across OECD countries), and "I enjoy co-operating with peers" (0.39 across OECD countries).

Figure V.5.2 ■ **Correlations among attitudes towards collaboration**
OECD average

Correlation between:							
I am a good listener	I enjoy seeing my classmates be successful	I take into account what others are interested in	I find that teams make better decisions than individuals	I enjoy considering different perspectives	I find that teamwork raises my own efficiency	I enjoy co-operating with peers	...and...
0.04	0.11	0.09	0.33	0.09	0.43	0.38	I prefer working as part of a team to working alone
	0.20	0.20	0.07	0.19	0.09	0.12	I am a good listener
		0.31	0.16	0.21	0.16	0.23	I enjoy seeing my classmates be successful
			0.16	0.25	0.14	0.19	I take into account what others are interested in
				0.16	0.39	0.31	I find that teams make better decisions than individuals
					0.18	0.19	I enjoy considering different perspectives
						0.39	I find that teamwork raises my own efficiency

Source: OECD, PISA 2015 Database, Table V.5.11.

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Responses to these eight statements are combined into two indices of co-operation, as shown in Figure V.5.3, that reflect the valuing of relationships and teamwork.¹ The four statements that comprise the index of valuing relationships are related to altruistic interactions, when the student engages in collaborative activities not for his or her own benefit: "I am a good listener"; "I enjoy seeing my classmates be successful"; "I take into account what others are interested in"; and "I enjoy considering different perspectives". By contrast, three of the four statements that comprise the index of valuing teamwork are related to what teamwork, as opposed to working alone, can produce: "I prefer working as part of a team to working alone"; "I find that teams make better decisions than individuals"; and "I find that teamwork raises my own efficiency" (Figure V.5.3).

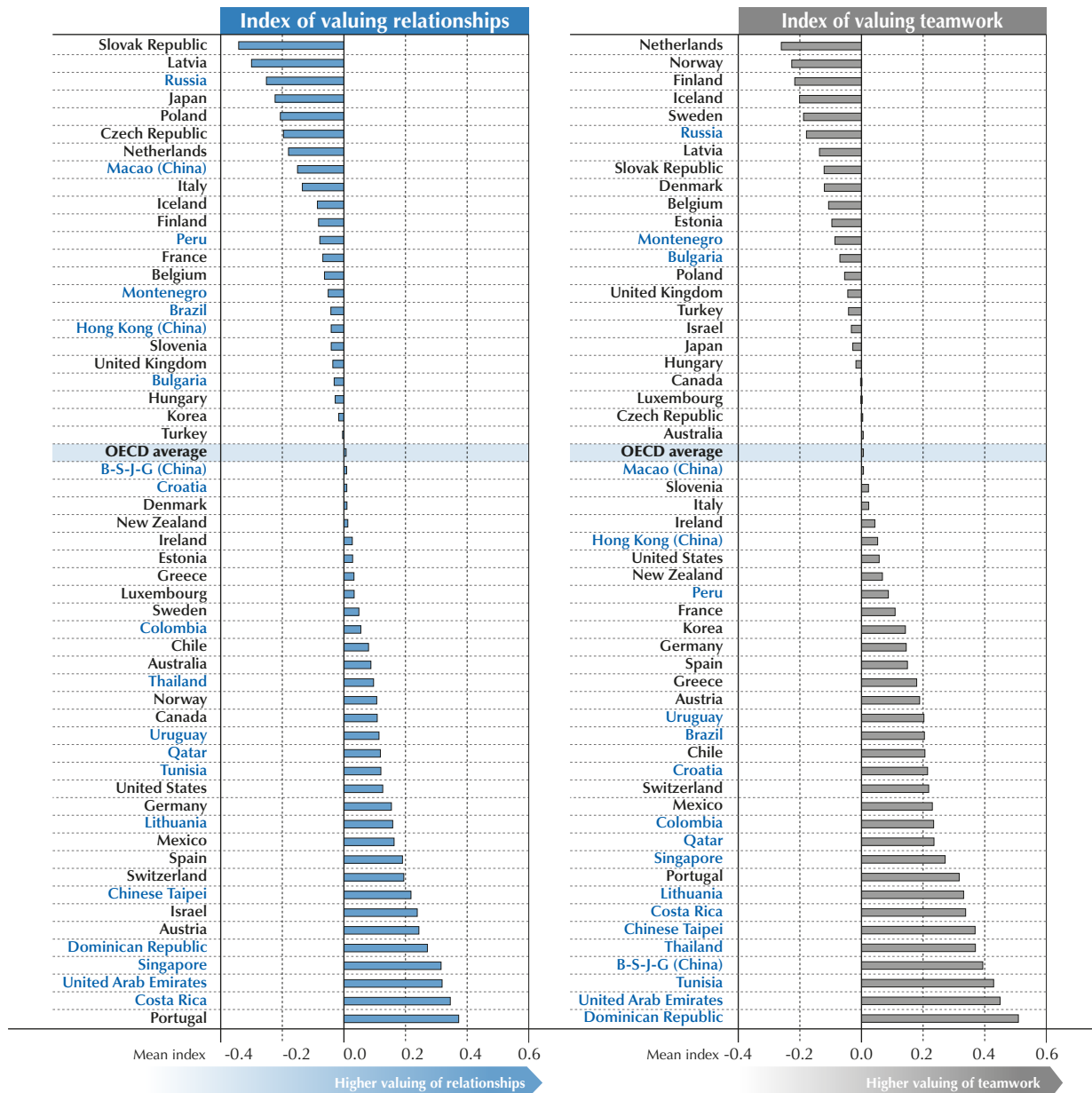
Each index is standardised to have a mean of 0 and a standard deviation of 1 across OECD countries. Students in Portugal have the highest index of valuing relationships (0.37) among all OECD and partner countries and economies, followed by Costa Rica, the United Arab Emirates and Singapore, all three of which have average indices of valuing relationships greater than 0.30 (Figure V.5.4). Students in Portugal also have the highest index of valuing teamwork (0.32) among OECD countries; however, the average student in the Dominican Republic has an index of valuing teamwork of 0.51 – over half a standard deviation above the average student in OECD countries. On average across OECD countries, the correlation between the indices of valuing relationships and teamwork is 0.41 (Table V.5.12). The correlation between the mean indices of valuing relationships and teamwork at the country level among OECD countries is 0.58: countries with a high mean value on one index also tend to have a high mean value of the other index.

Figure V.5.3 ■ **Indices of co-operation**

Index of valuing relationships	Index of valuing teamwork
I am a good listener	I prefer working as part of a team to working alone
I enjoy seeing my classmates be successful	I find that teams make better decisions than individuals
I take into account what others are interested in	I find that teamwork raises my own efficiency
I enjoy considering different perspectives	I enjoy co-operating with peers



Figure V.5.4 ■ Indices of valuing relationships and valuing teamwork



Countries and economies are ranked in ascending order of each index.

Source: OECD, PISA 2015 Database, Table V.5.1.

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WITHIN-COUNTRY DIFFERENCES IN ATTITUDES TOWARDS COLLABORATION

Table V.5.3 shows a breakdown of the variation in attitudes towards collaboration in the countries and economies that participated in the PISA 2015 collaborative problem-solving assessment. Some 97% and 98%, respectively, of the variation in the indices of valuing relationships and valuing teamwork lie within schools. In other words, differences across schools account for only 3% of the differences in the index of valuing relationships and only 2% of the differences in the index of valuing teamwork. Student-level variation, not school-level variation, thus explains most of the observed differences in attitudes towards collaboration. This may reflect that students' frame of reference in reporting their attitudes lies within the familiar environment of their schools. Variation related to student demographics is examined next, while variation related to student behaviours and activities, and school policies and practices, is explored in Chapter 6.



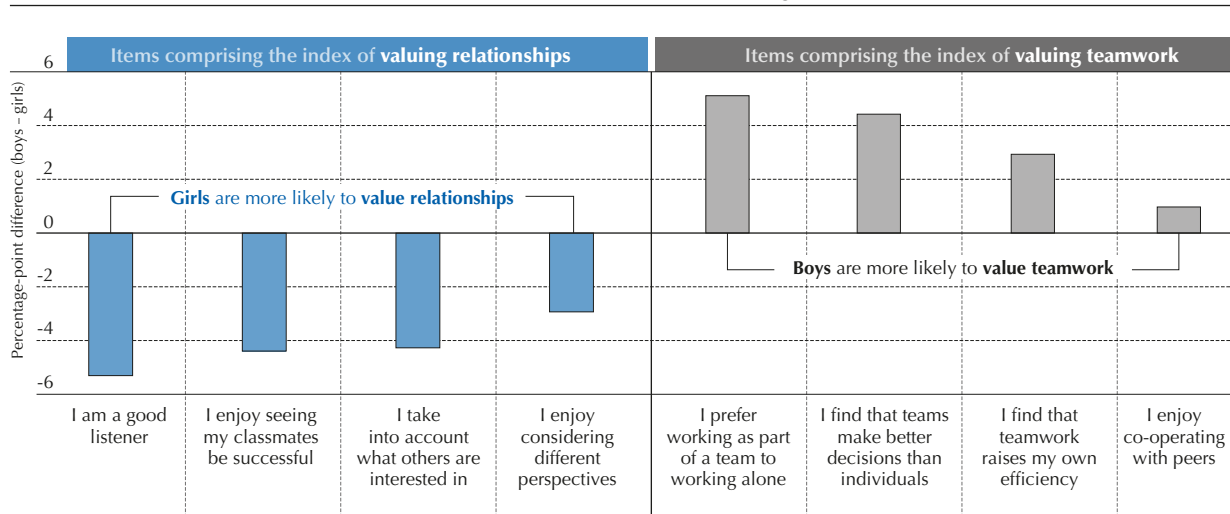
Gender differences in attitudes towards collaboration

Cross-country comparisons of attitudes towards collaboration are difficult to interpret given the cultural differences between countries and economies. Such cultural differences are, to a certain extent, eliminated when examining differences in students' attitudes within countries.^{2,3}

One such within-country comparison is between boys and girls. Girls were significantly more likely than boys to agree or strongly agree with the four statements that comprise the index of valuing relationships. For example, on average across OECD countries, girls were 5.3 percentage points more likely than boys to report that they agree or strongly agree that "[they] are a good listener" (Figure V.5.5). Moreover, this difference is significant and in favour of girls in 54 of the 56⁴ countries that conducted the collaborative problem-solving assessment; in the two other countries, the difference is not significant. Gender differences are most pronounced in Italy and Latvia, where there is a 10 percentage-point gap (Table V.5.4a).

By contrast, boys were significantly more likely than girls to report that they agree or strongly agree with the four statements that comprise the index of valuing teamwork (Figure V.5.5).⁵ The difference is most pronounced for the statement "I prefer working as part of a team to working alone", with which boys were 5.1 percentage points more likely than girls to agree or strongly agree. This difference is significant and in favour of boys in 38 of 56 countries; it is significant and in favour of girls in only one country: Beijing-Shanghai-Jiangsu-Guangdong (China) (a 4.1 percentage-point gap). The gender gap is widest in Canada, Iceland and Sweden, where it exceeds 10 percentage points (Table V.5.4b).

Figure V.5.5 ■ **Gender differences in attitudes towards collaboration**
Difference in the percentage of boys and girls who agreed/strongly agreed with the following statements about collaboration, OECD average



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

Source: OECD, PISA 2015 Database, Tables V.5.4a and V.5.4b.

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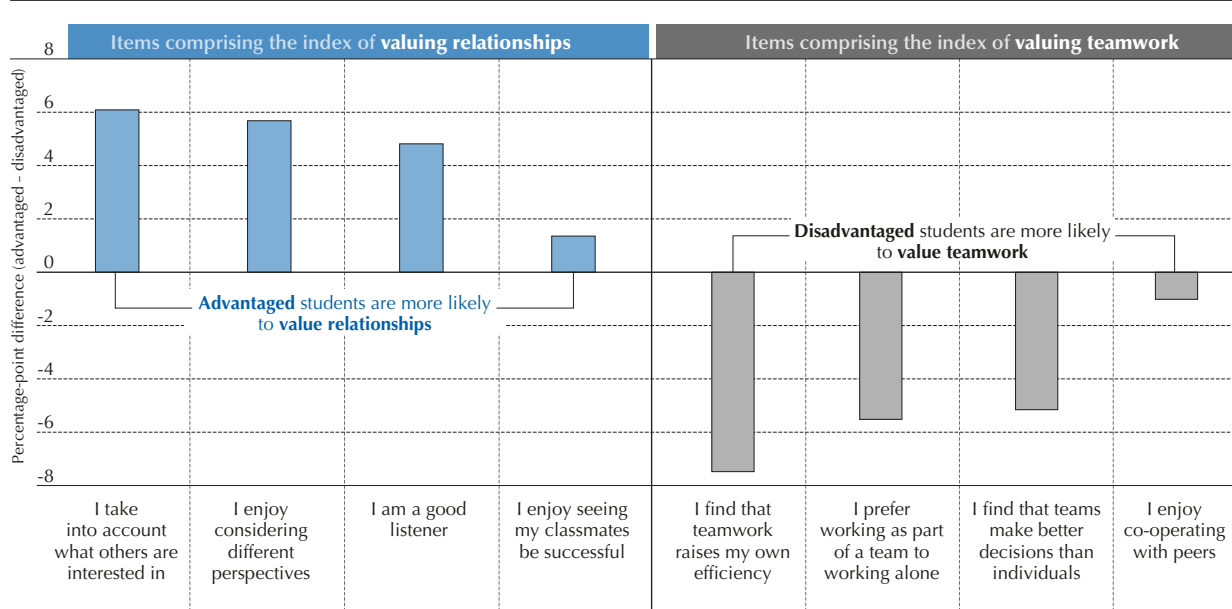
The consistent cross-country gender differences observed in responses to these eight statements differ from Wang et al. (2009), who find no significant gender differences in teamwork (whether reported by students themselves, by teachers, or through responses to hypothetical situations) in a United States high school.

Differences in attitudes towards collaboration, by socio-economic status

Figure V.5.6 shows differences in attitudes towards collaboration related to socio-economic status across OECD countries. The figure plots the difference in the percentage of students in the top national quarter of socio-economic status, as measured by the PISA index of economic, social and cultural status, and the percentage of students in the bottom national quarter of socio-economic status who reported that they either agree or strongly agree with each statement. Students in the top quarter of socio-economic status are referred to as advantaged students, while students in the bottom quarter are referred to as disadvantaged students.



Figure V.5.6 ■ **Socio-economic differences in attitudes towards collaboration**
 Difference in the percentage of advantaged and disadvantaged students who agreed/strongly agreed with the following statements about collaboration, OECD average



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

A socio-economically disadvantaged (advantaged) student is a student in the bottom (top) quarter of the PISA index of economic, social and cultural status (ESCS) in their country/economy.

Source: OECD, PISA 2015 Database, Table V.5.6a.

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Significant differences related to socio-economic status in the propensity to agree or strongly agree with each statement are observed. Across all OECD countries, advantaged students were 6.1 percentage points more likely than disadvantaged students to report that they agree or strongly agree with the statement “I take into account what others are interested in”; 5.7 percentage points more likely to agree or strongly agree with the statement “I enjoy considering different perspectives”; 4.8 percentage points more likely to agree or strongly agree with the statement “I am a good listener”; and 1.4 percentage points more likely to agree with the statement “I enjoy seeing my classmates be successful” (Figure V.5.6 and Table V.5.6a). These four statements comprise the index of valuing relationships.

These results are consistent with some recent literature, which shows that those of higher socio-economic status tend to self-report higher levels of empathy (Varnum et al., 2015), which might be related to valuing relationships with others, and a variety of other positive traits, including honesty, sense of humour and friendliness (Varnum, 2015). However, most of the literature seems to suggest that it is students of lower socio-economic status who more commonly exhibit behaviour consistent with co-operation and consideration of others (Pitt and Robinson, 2017). For example, in the United States, university students who were the first in their family to attend university were more likely to be other-focused (as opposed to self-oriented) than university students whose parents had also attended university. These first-generation university students performed worse academically when universities were portrayed as an independent environment where everyone had to make his or her own way, but performed as well as other students when universities were portrayed as an interdependent environment or a community (Stephens et al., 2012). Intriguingly, brain scans show that those of higher socio-economic status actually display reduced neural responses of empathy (Varnum et al., 2015). It appears that those of higher socio-economic status might overstate the degree to which they display certain positive attributes, with the same outcome as if they displayed higher levels of social desirability.

By contrast, disadvantaged students were 7.5 percentage points more likely than advantaged students to agree or strongly agree with the statement “I find that teamwork raises my own efficiency”; 5.5 percentage points more likely to agree or strongly agree with the statement “I prefer working as part of a team to working alone”; 5.2 percentage points more likely to agree or strongly agree with the statement “I find that teams make better decisions than individuals”; and 1.0 percentage point more likely to agree or strongly agree with the statement “I enjoy co-operating with peers” (Figure V.5.6 and Table V.5.6a). These four statements comprise the index of valuing teamwork.



The data indicate that advantaged students were more likely to report that they agree or strongly agree that they engage in co-operative activities that do not directly involve personal gain, while disadvantaged students were more likely to report that they agree or strongly agree that teamwork brings benefits.⁶ A similar dichotomy is observed between girls and boys.

THE RELATIONSHIP BETWEEN ATTITUDES TOWARDS COLLABORATION AND OTHER ATTITUDES

PISA 2015 Results (Volume III): Students' Well-Being (OECD, 2017) analyses a variety of well-being indicators based on data from the student questionnaire. What is the relationship between such well-being indicators and attitudes towards collaboration? Are students who have a greater sense of well-being also predisposed to co-operating and collaborating with others?

There is a weak but positive correlation between the indices of valuing relationships and valuing teamwork with the self-reported degree of life satisfaction and the index of achievement motivation (Table V.5.12). These latter two measures of well-being are both positive measures: a higher value in each index is associated with a greater sense of well-being.

In particular, 15-year-old students across OECD countries were significantly more likely to report that they agree or strongly agree with almost all of the statements regarding collaboration described above if they also agreed or strongly agreed with the statements regarding their motivation to achieve. For instance, students in every country and economy were more likely to report that they agree with each of the statements that comprise the index of valuing relationships if they reported that they agree or strongly agree that they “want to be able to select from among the best opportunities available when [they] graduate”⁷ (Table V.5.13b). On average across OECD countries, there is a gap of over 13 percentage points in responses to each of the items that comprise the index of valuing relationships between students who agreed or strongly agreed with and students who disagreed or strongly disagreed with the statement “I want to be able to select from among the best opportunities available when I graduate”.

The only exception observed is that students were at least one percentage point less likely to report that they agree or strongly agree that they “prefer working as part of a team to working alone” if they agree or strongly agree that they “want to be one of the best students in [their] class” (Table V.5.13b).

Likewise, both indices are weakly but positively correlated with the index of sense of belonging at school and weakly but negatively correlated with the index of exposure to bullying. The former is another positive measure of well-being, while the latter is a negative measure of well-being, where a higher value is considered to be a weaker sense of well-being (Table V.5.12). Hence it appears that a greater disposition towards collaboration goes hand-in-hand with indicators of social well-being.

However, both indices are weakly but positively correlated with the index of schoolwork-related anxiety, which is another negative measure (Table V.5.12). This might be related to the positive correlation between, for example, achievement motivation and anxiety, as discussed in *PISA 2015 Results (Volume III): Students' Well-Being* (OECD, 2017). Hewitt and Flett (1991) define self-oriented perfectionists as those who set high standards for themselves and frequently evaluate their own behaviour and performance. Such self-oriented perfectionists have been found to score higher in some measures of anxiety, such as worry, but lower in other measures of anxiety, such as lack of confidence or being distracted and preoccupied by other thoughts (Stoeber, Feast and Hayward, 2009). They have also been found to show high levels of social connection, as measured through trust and empathy, and low levels of hostility towards others (Stoeber et al., 2017). These self-oriented perfectionists might therefore tend to have more positive attitudes towards co-operation yet at the same time higher levels of anxiety.

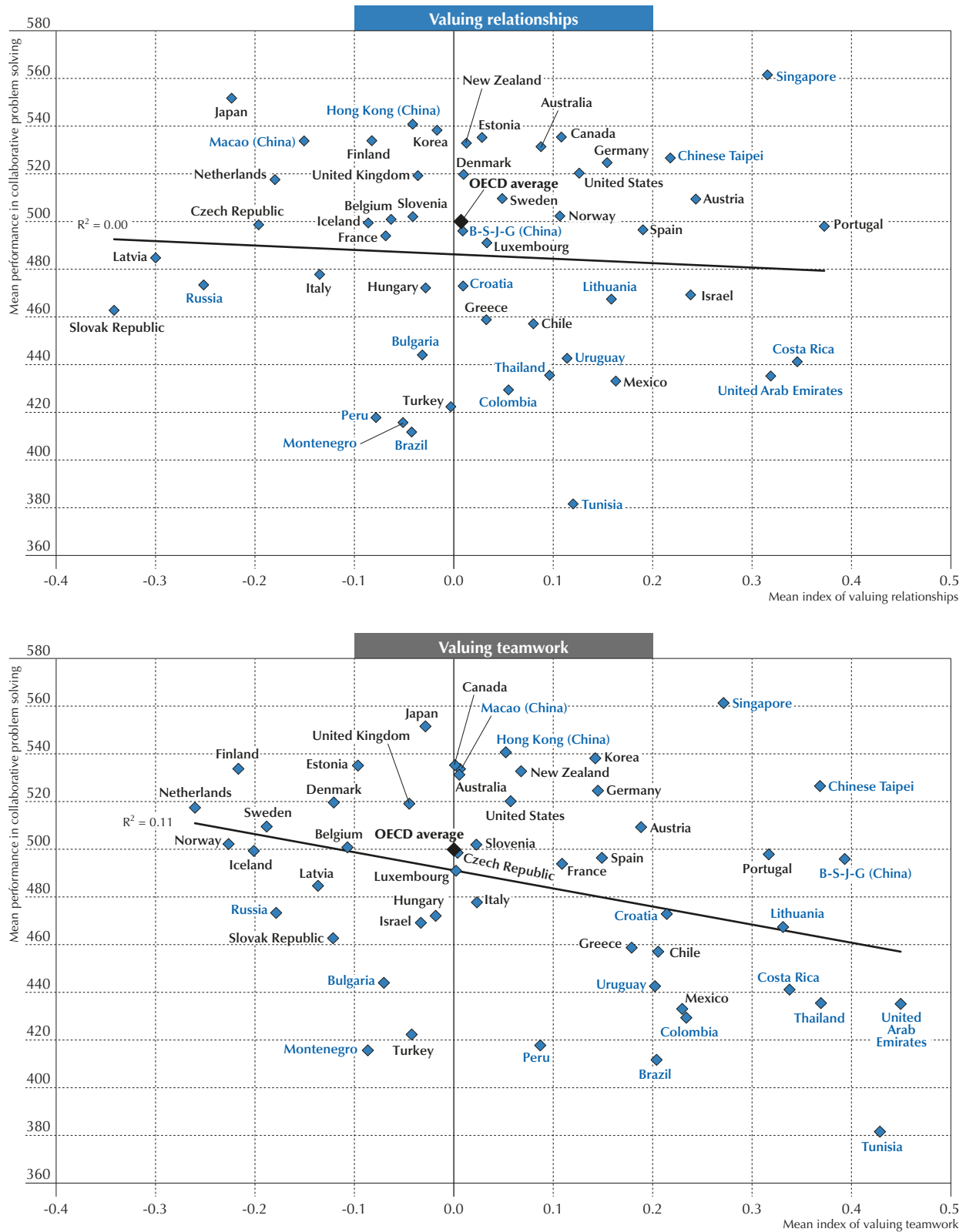
THE RELATIONSHIP BETWEEN ATTITUDES TOWARDS COLLABORATION AND COLLABORATIVE PROBLEM-SOLVING PERFORMANCE

Previous chapters present student performance in the PISA 2015 collaborative problem-solving assessment, while this chapter presents student-reported attitudes towards collaboration. Is there a relationship between the two? Are students who have more positive attitudes towards collaboration also better able to solve problems collaboratively?

Figure V.5.7 plots a country or economy's mean score in collaborative problem solving against its mean index of valuing relationships or valuing teamwork. No correlation was observed between performance and the index of valuing relationships ($r^2 = 0.00$). However, a slight negative correlation (with $r^2 = 0.11$) was observed between performance and the index of valuing teamwork. Due to cross-cultural differences in how students report their attitudes towards collaboration, it is difficult to interpret the relationship between indices of collaboration and collaborative problem-solving performance at the mean country/economy level.



Figure V.5.7 ■ Performance in collaborative problem solving and the indices of valuing relationships and valuing teamwork



Source: OECD, PISA 2015 Database, Tables V.3.2 and V.5.1.

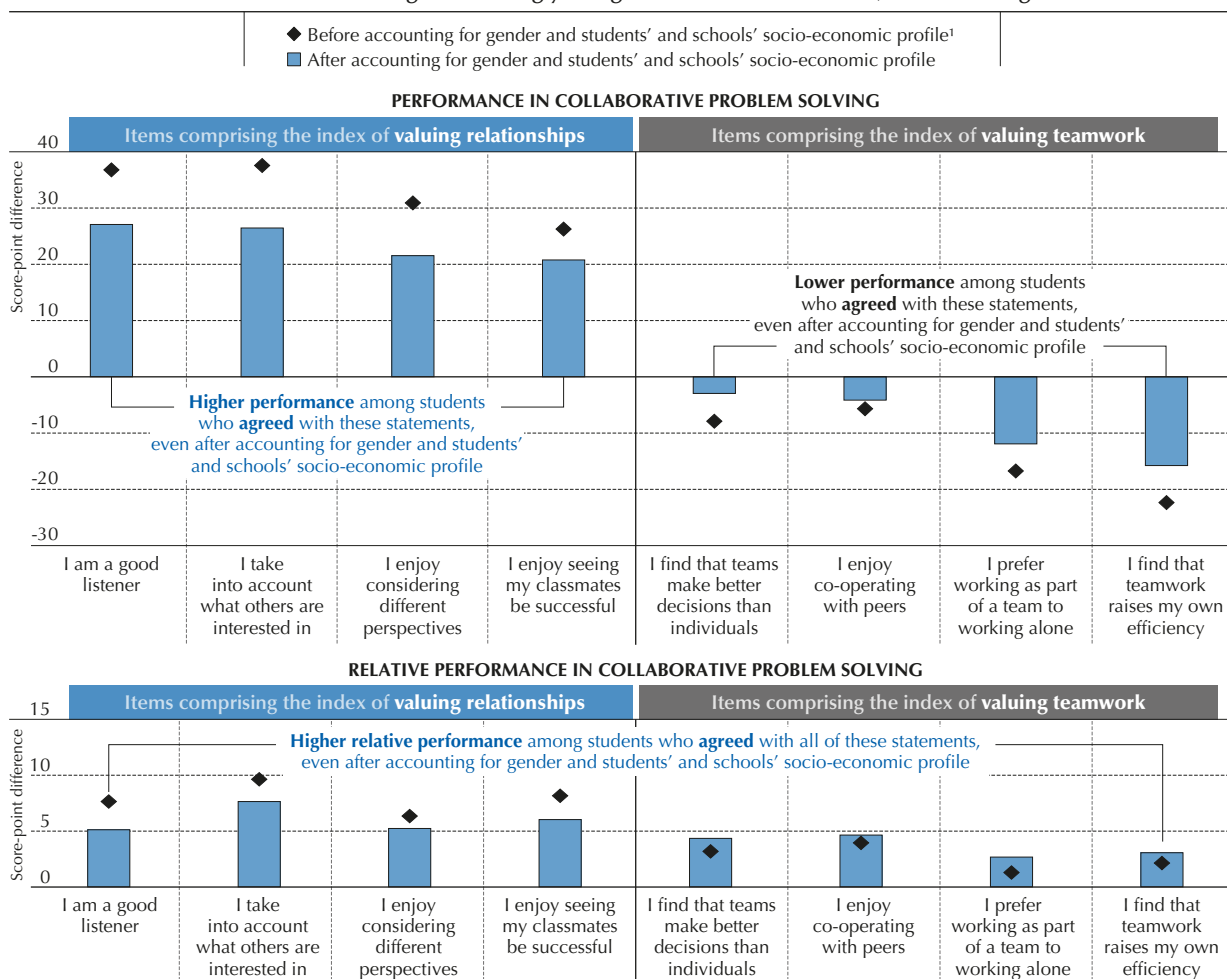
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On the other hand, significant relationships can be found when examining within-country differences in student performance related to self-reported attitudes towards collaboration. On average across OECD countries, students who reported that they agree or strongly agree with the statements that comprise the index of valuing relationships score better than those who reported that they disagree or strongly disagree with those statements. The performance gap varies from 38 points for the statement "I take into account what others are interested in" to 26 points for "I enjoy seeing my classmates be successful" (Figure V.5.8).

By contrast, students who reported that they agree or strongly agree with the statements that comprise the index of valuing teamwork score below students who reported that they disagree or strongly disagree with those statements, on average across OECD countries. For example, the performance gap related to the statement "I find that teamwork raises my own efficiency" is 22 points, while the gap related to the statement "I prefer working as part of a team to working alone" is 17 points (Figure V.5.8). The direction of the performance gaps related to each statement is also remarkably consistent across countries and economies (Tables V.5.2a to V.5.2h).

Figure V.5.8 ■ **Attitudes towards collaboration and performance in collaborative problem solving**
Score-point difference in performance between those who agreed/strongly agreed with each statement and those who disagreed/strongly disagreed with the statement, OECD average



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

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

Relative performance refers to the residual performance, attributable to purely "collaborative problem-solving" competencies, after accounting for performance in science, reading and mathematics in a regression performed across students internationally.

Statements about attitudes towards collaboration are ranked in descending order of the score-point difference in collaborative problem solving between students who agreed/strongly agreed with and those who disagreed/strongly disagreed with the above statements.

Source: OECD, PISA 2015 Database, Tables V.5.2a-h.

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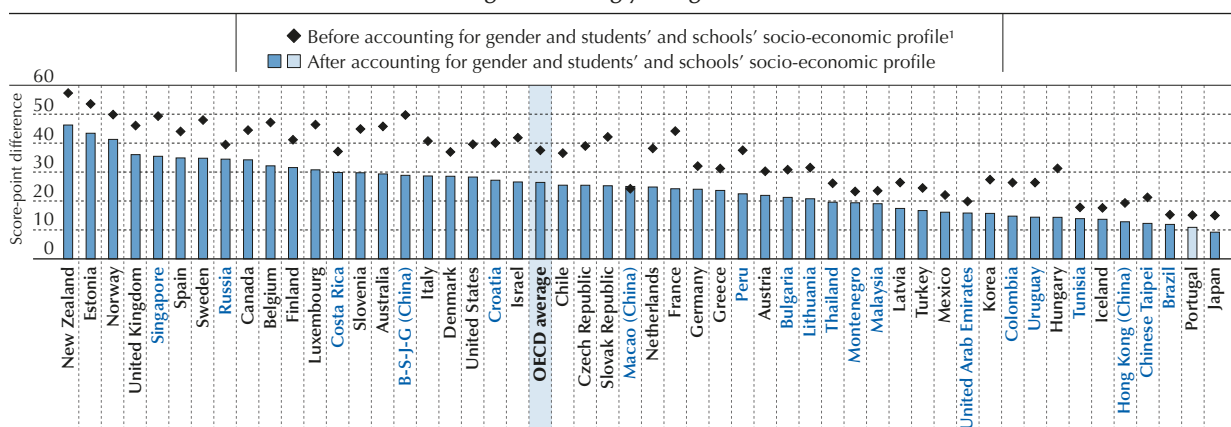
Accounting for gender and both students' and schools' socio-economic profile tends to reduce the performance gap for all statements, although it does not change the direction of the gap: students who agreed or strongly agreed with the statements in the index of valuing relationships, and students who disagreed or strongly disagreed with the statements in the index of valuing teamwork still perform better in collaborative problem solving (Figure V.5.8). The reduction in the performance gap is somewhat to be expected, given the relationships in performance, attitudes, and gender and socio-economic profile. For example, girls tend to perform better than boys in the collaborative problem-solving assessment and tended to agree or strongly agree more often to the statements comprising the index of valuing relationships. Since students who agreed or strongly agreed with these statements also perform better in the collaborative problem-solving assessment, accounting for gender should reduce the score-point difference associated with agreeing to these statements.

But other patterns are observed after accounting for performance in the three core PISA subjects (science, reading and mathematics). There is a positive association between agreeing or strongly agreeing with any of the items related to attitudes towards collaboration – both the items that comprise the index of valuing relationships and those that comprise the index of valuing teamwork – and relative performance in collaborative problem solving (Figure V.5.8).⁸ These positive associations persist after accounting for gender, and students' and schools' socio-economic profile. On average across OECD countries, students who agree or strongly agree with the statements in the index of valuing relationships perform between five and eight points higher in collaborative problem solving after accounting for performance in the three core PISA subjects, gender, and students' and schools' socio-economic profile, while they perform between two and five points higher if they agree or strongly agree with the statements in the index of valuing teamwork.

The direction of the performance gaps between students who responded that they agree or strongly agree and students who responded that they disagree or strongly disagree with each statement was fairly consistent across countries and economies. For example, the strongest positive association is observed with the statement "I take into account what others are interested in" (Figure V.5.8). After accounting for performance in the three core PISA subjects, gender, and students' and schools' socio-economic profile, students who reported that they agree or strongly agree with this statement score eight points higher than those who reported that they disagree or strongly disagree with the statement. This difference is significant and in favour of students who reported that they agree or strongly agree in 20 of the 52 countries that participated in the PISA 2015 collaborative problem-solving assessment, and is over 20 points⁹ in Estonia and New Zealand. Only in Colombia is the difference significant and in favour of students who reported that they disagree or strongly disagree with the statement "I take into account what others are interested in" (Figure V.5.9 and Table V.5.2d). Similar results are seen for the other items in the index of valuing relationships.

Figure V.5.9 ■ **Taking into account others' interests and performance in collaborative problem solving**

Difference in collaborative problem-solving performance between students who agreed/strongly agreed with the statement "I take into account what others are interested in" and those who disagreed/strongly disagreed with that statement



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

Note: Statistically significant differences are shown in a darker tone. All differences before accounting for gender and students' and schools' socio-economic profile are statistically significant (see Annex A3).

Countries and economies are ranked in descending order of the score-point difference between students who agreed/strongly agreed with the statement above and students who disagreed/strongly disagreed, after accounting for gender and students' and schools' socio-economic profile.

Source: OECD, PISA 2015 Database, Table V.5.2d.

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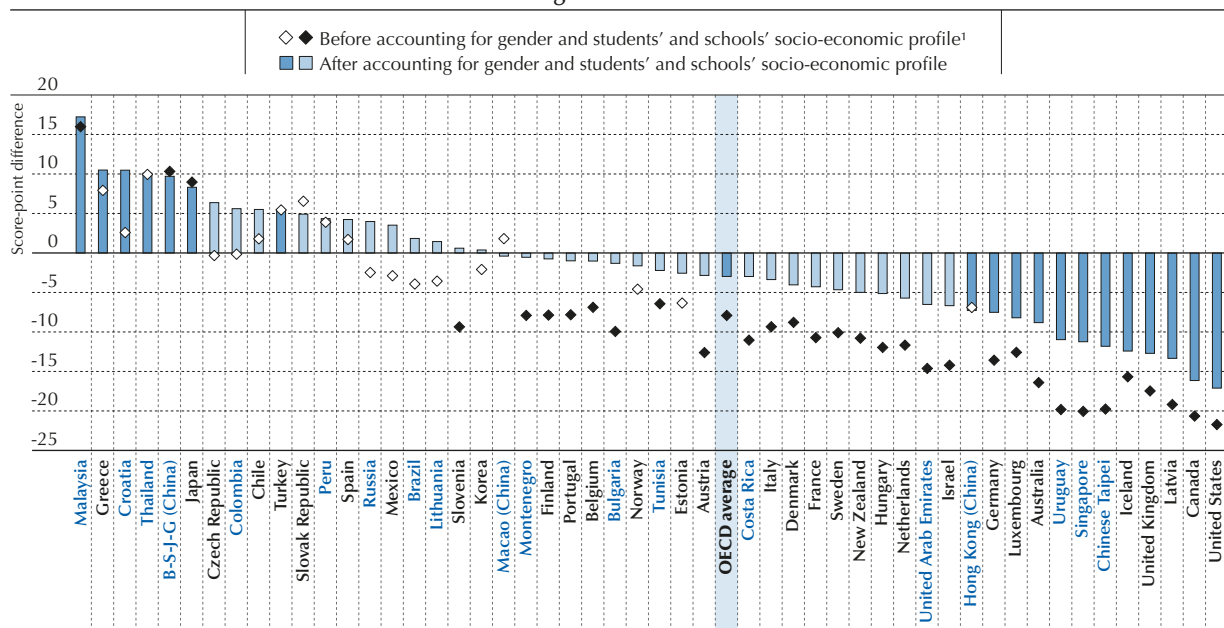
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Performance gaps related to items in the index of valuing teamwork are also fairly consistent across countries. As one example, students in 20 out of 52 countries who reported that they agree or strongly agree that “[they] find that teams make better decisions than individuals” perform better in the collaborative problem-solving assessment, after accounting for performance in the three core PISA subjects, gender, and students’ and schools’ socio-economic profile. The gap is 4 score points, on average across OECD countries, and more than 10 score points in Croatia and Portugal. Only in Tunisia is this difference significant and in favour of students who reported that they disagree or strongly disagree with this statement (Figure V.5.10 and Table V.5.2e).

Hence, it appears that positive attitudes towards collaboration – whether for altruistic reasons or for the benefit of one’s own success in a collaborative project – are associated with the distinctive aspects of solving problems collaboratively. Students who perform at lower levels of proficiency are more likely to recognise the effectiveness of collaboration. However, a positive disposition towards collaboration, even if it is for the benefits to oneself that collaboration can bring, is still associated with better performance in collaborative problem solving when comparing students with similar performance in science, reading and mathematics.

Figure V.5.10 ■ **Finding that teams make better decisions and performance in collaborative problem solving**

Difference in collaborative problem-solving performance between students who agreed/strongly agreed with the statement “I find that teams make better decisions than individuals” and those who disagreed/strongly disagreed with that statement, after accounting for performance in science, reading and mathematics



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

Note: Statistically significant differences are shown in a darker tone (see Annex A3).

Countries and economies are ranked in descending order of the score-point difference between students who agreed/strongly agreed with the statement above and students who disagreed/strongly disagreed, after accounting for gender and students’ and schools’ socio-economic profile.

Source: OECD, PISA 2015 Database, Table V.5.2e.

StatLink  <http://dx.doi.org/10.1787/888933616313>



Notes

1. The four highly-correlated items described in the previous paragraph are indeed the constituent components of the index of valuing teamwork.
2. Examining differences within countries/economies allows for the elimination of country/economy-specific response patterns common across all subgroups in the country/economy. For example, if all students in Country A with a certain latent trait (e.g. a certain actual “level” of valuing relationships) *report* a higher index of valuing relationships than students in Country B with the same latent trait, comparisons of the reported trait are biased. However, within-country differences between subgroups in Country A and Country B may still be meaningful.

However, subgroups in each country/economy may also respond differently. For example, boys and girls may be socialised differently, leading to boys systematically reporting a higher or lower index than girls when their latent traits are actually identical. There is no way to determine the extent of such systematic differences from PISA data. If the systematic differences are common across countries, though, international comparisons can still be made.
3. Cross-country comparisons of attitudes are difficult due to cultural differences. As these cultural differences may still exist between non-immigrant and immigrant students who reside in the same country or economy, this chapter will not discuss immigrant-related differences in attitudes. Data on these differences are available in Tables V.5.8a to V.5.8d.
4. Although 57 countries and economies participated in the computer-based assessment in 2015, the coverage of data from Malaysia on attitudes was too small to ensure comparability.
5. Although girls are significantly likelier to agree or strongly agree with the statements that comprise the index of valuing relationships, and boys are significantly likelier to agree or strongly agree with the statements that comprise the index of valuing teamwork, it is still possible for responses to all eight statements to be positively correlated. Both boys and girls who value relationships are more likely to value teamwork; the difference lies in their average proclivity to agree to each statement.
6. Separate analyses, not presented in the text, show that the relationship between various measures of school-level diversity in socio-economic status and attitudes towards collaboration is generally not significant, both on average across the OECD and in individual countries/economies.
7. There are two exceptions: in Korea and Portugal, students who agree or strongly agree that they “want to be able to select from among the best opportunities available when they graduate” and those who disagree or strongly disagree to this statement are statistically as likely to agree or strongly agree that they “enjoy seeing [their] classmates be successful”.
8. Relative collaborative problem-solving performance is calculated by an ordinary least squares regression of collaborative problem-solving performance over performance in science, reading and mathematics. In Chapter 3, the regression is performed at the international level in order to rank countries and economies. In Chapters 4, 5, 6 and 7, the regression is performed at the individual country or economy level, as the focus is on factors related to differences in performance within each country/economy. This results in an average residual of 0 for each country/economy.
9. Differences in relative performance in collaborative problem solving are typically smaller than differences in raw (actual) performance in collaborative problem solving as much of the variation in the former set of scores is eliminated after accounting for performance in the three core PISA subjects.

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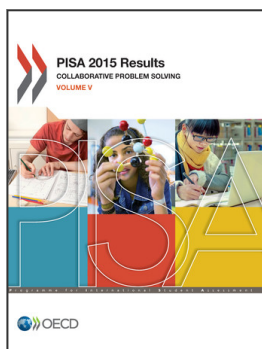
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