

To News Editor

3 December 2013

CUHK Releases the Results of Programme for International Student Assessment 2012

The Hong Kong Centre for International Student Assessment of the Hong Kong Institute of Educational Research at The Chinese University of Hong Kong (CUHK) released the survey results of Programme for International Student Assessment 2012 (PISA 2012) today (3 December). During April to May 2012, about 5,000 students from 148 schools including government, aided and independent schools were randomly selected for the assessment of student performance in mathematics, science and reading.

The survey reveals that Hong Kong 15-year-old students again stand in the top tier among 65 countries and regions. Specifically, Hong Kong students rank third in mathematics and second in both reading and science (Figure 1 and Appendix 1). Regarding equity in education, the difference in performance between students of different socio-economic background changes little when compared with the first PISA survey in Hong Kong. The difference in student performance between schools is getting smaller but remains significant. The impact of socio-economic status (SES) aggregated at school level is considerably reduced. Taking together, these changes suggest that the basic education of Hong Kong is heading toward a quality education with equality. However, it is found that the within-school difference of student performance has increased (Figure 2), suggesting that the academic ability of students within school is more diverse. As such, how secondary school teachers should equip themselves, and what support measures the education authority should provide schools in order to take care of the increased learning diversity of students in schools would be the timely agenda.

Equality in education in terms of how students' SES, gender, and immigrant status affect their performance in schools is examined. It is found that the impact of students' SES including occupation and education level of their parents has relatively small impact on their performance (Figure 3 and Appendix 2). Yet significant gender difference is still evident in the performance of both mathematics and reading. Boys outperform girls by 15 points in mathematics and girls outperform boys by 25 points in reading (Figure 4). Both differences are statistically significant. Also, the performance of immigrant students who were born outside Hong Kong is significantly poorer than that of local-born students, with a difference up to 20 to 26 points (Figure 5). The disadvantage of immigrant students appears to reduce over time but is still significant.

Various outcomes of students' self-related cognition are also examined. Results show that students' self-efficacy and self-concept in mathematics have improved from 2003 to 2012. Yet, the self-concept in mathematics of Hong Kong students is still lower than the OECD average. Students' anxiety towards learning mathematics is still higher than the OECD average in spite of their top performance in mathematics among the 65 participating countries and regions (Figure 6).

Regarding parental factors, parents' investment, involvement and perception of school quality are found to be correlated with their children's mathematics performance. Parents' involvement in child's education at home has a positive impact on the learning outcomes. If a parent spends more time talking to their children at home (e.g. discuss current affairs, movies or television programmes, books or school life with the child), the child tends to perform better. However, parents' involvement in school such as acting as parent volunteers or attending parental programmes is found to be negatively correlated with students' performance. One possible explanation of this negative relationship could be that at the stage of secondary education, parents' contact with school or involvement in school activities are quite often initiated by students' behavioral or academic problems. In other words, parents' involvement in school is largely problem-oriented. This undesirable condition needs to be further explored for improvement (Figure 7). As an evaluator of school quality, the more parents are satisfied with their children's school, the more students tend to have better performance.

The survey has also collected data concerning other educational issues such as student motivation and school climate (Figure 8). These will be further studied and reported.

Organised by the Organisation for Economic Co-operation and Development (OECD), PISA compares and evaluates the effectiveness of education systems by assessing how well 15-year-olds approaching the end of compulsory education have acquired the knowledge and skills essential for participation in society. The assessment is conducted every three years.

Media enquiries: Ms. Belinda Pui, Communications and Public Relations Office, CUHK (Tel: 3943-8896)

Figure 1-8 and Appendix 1,2

Figure 1: Comparison of Hong Kong Students’ Performance in Mathematics, Science and Reading in PISA from 2000+ to 2012

Cycle	Mathematics		Science		Reading	
	Mean	S.E.	Mean	S.E.	Mean	S.E.
2000+ ^Δ	560	3.3	541	3.0	525	2.9
2003	550	4.5	539	4.3	510	3.7
2006	547	2.7	542	2.5	536	2.4
2009	555	2.7	549	2.8	533	2.1
2012	561#	3.2	555##	2.6	545###	2.8

indicates significant difference in Mathematics performance between 2012 and 2006.

indicates significant differences in Science performance between 2012 and 2006, 2012 and 2003, 2012 and 2000+.

indicates significant differences in Reading performance between 2012 and 2009, 2012 and 2006, 2012 and 2003, 2012 and 2000+.

Δ Note: PISA 2000+ was administered in 2002.

Figure 2: Variance in Student Performance Between and Within Schools

Cycle	Index of academic inclusion	Between-school variance	Within-school variance
2003	51.9	4806 (48.1%)	5184 (51.9%)
2012	57.6	3924 (42.4%)	5330 (57.6%)
Diff (2012-2003)	5.7	-882	146

Figure 3: Relationship between Student Performance in Mathematics and ESCS in Twelve Countries/Regions

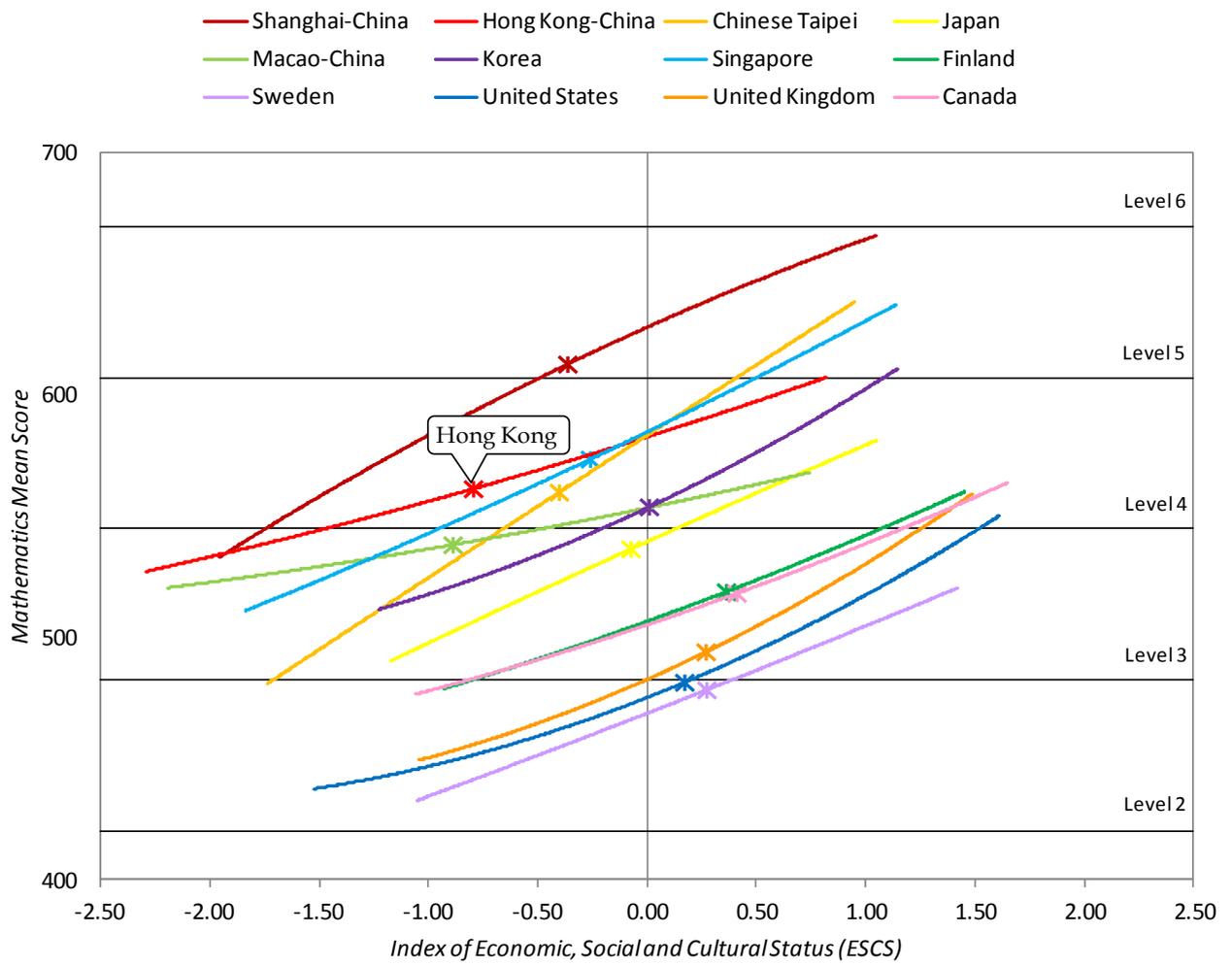


Figure 4: Gender Differences in Mathematical, Scientific and Reading Literacy in PISA in Hong Kong from 2000+ to 2012

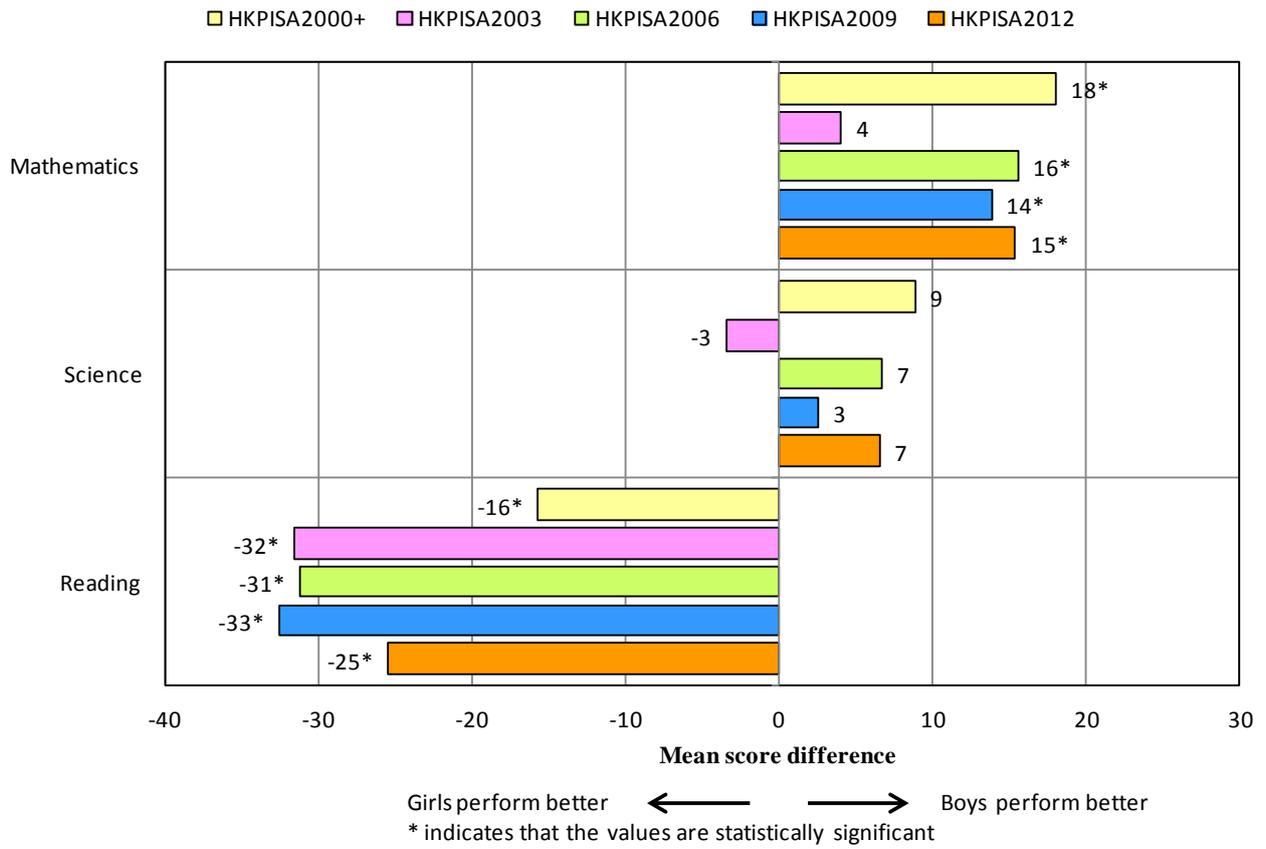
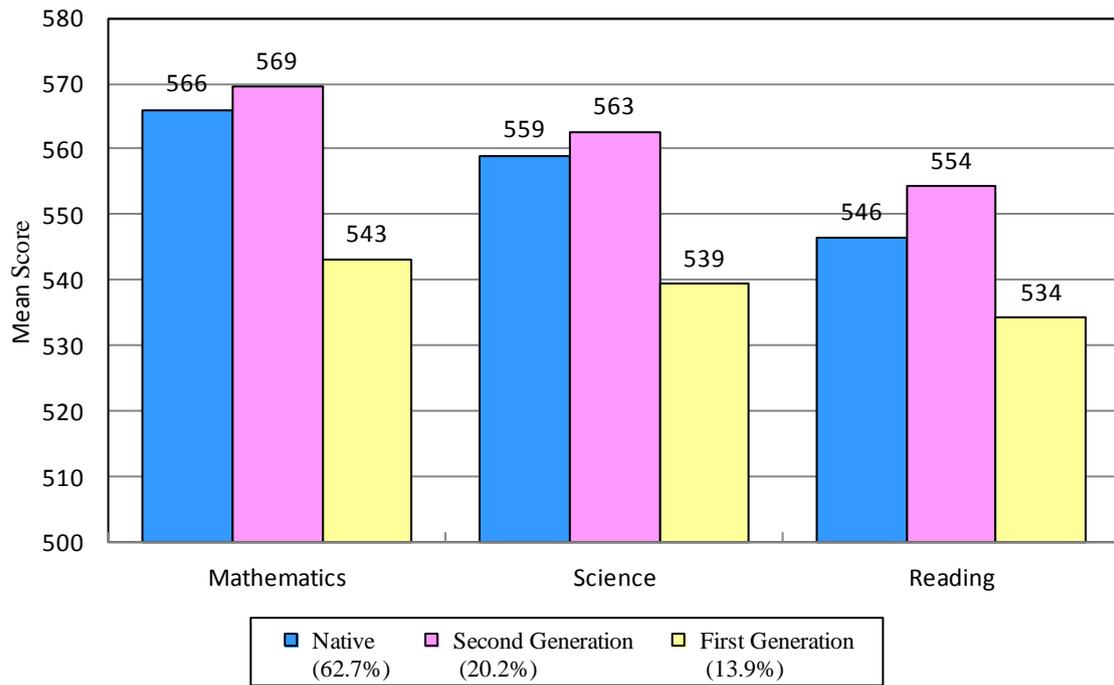
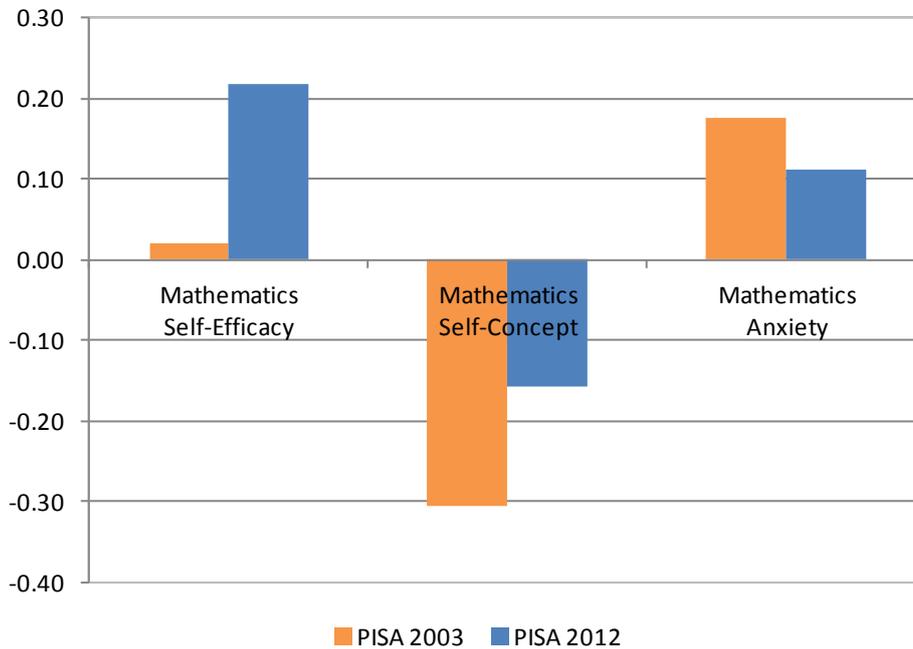


Figure 5: PISA 2012 Literacy Performance of Hong Kong Students by Immigrant Status^Δ



^Δ Note: Figures in parentheses indicate the percentages of students of different immigrant statuses.

Figure 6: Indices of Self-related Cognition of Hong Kong Students in PISA 2012



Note: OECD averages of the indices are set at 0.00.

Figure 7: Relationship between Parental Factors and Students' Mathematical Literacy Performance

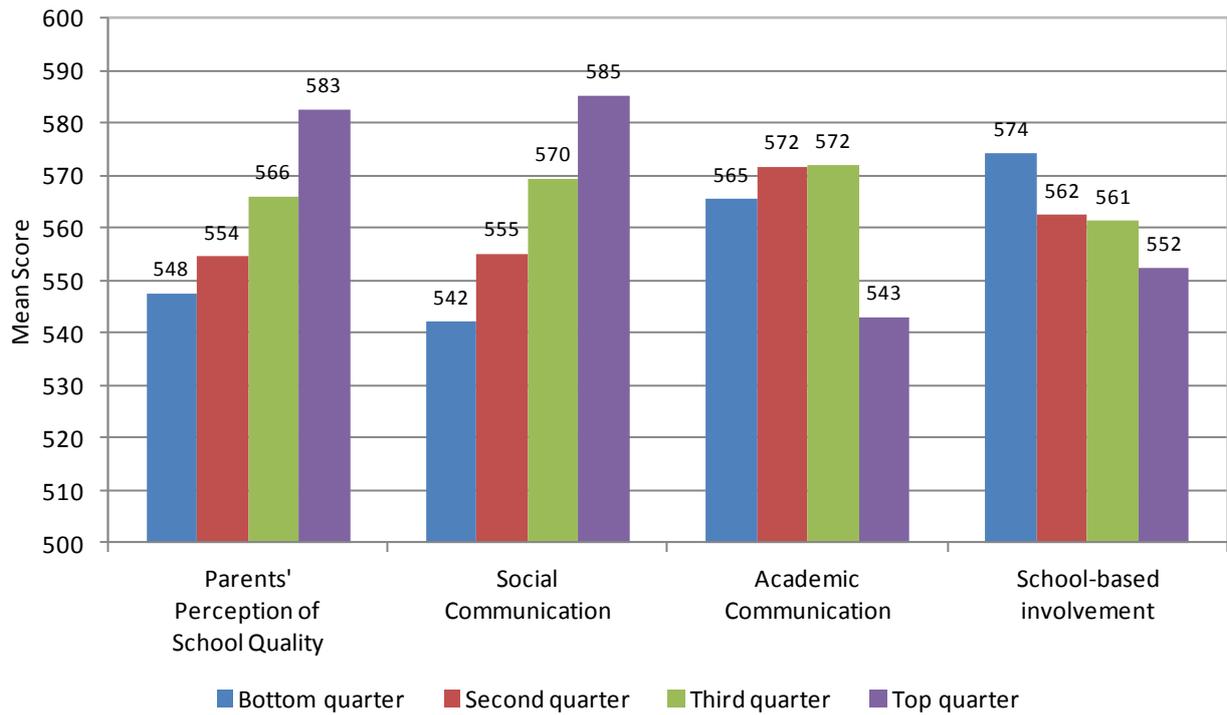
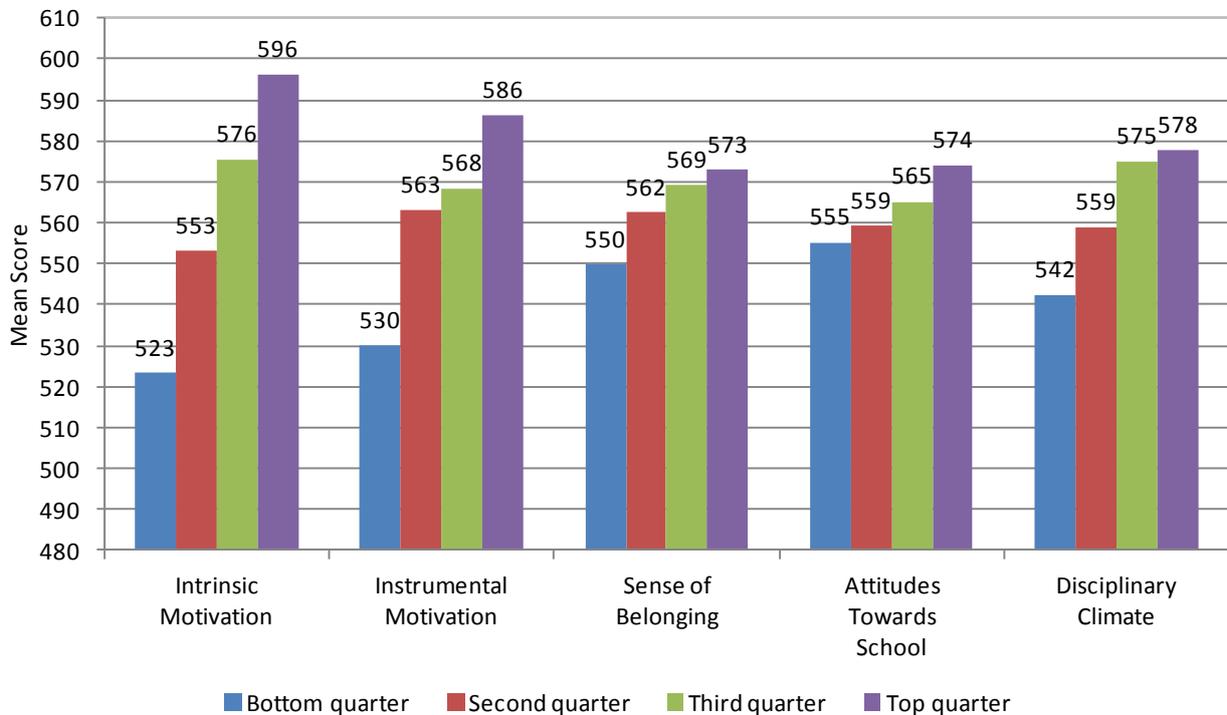


Figure 8: Relationship between Students' Motivation, School Climate and Students' Mathematical Literacy Performance



Appendix 1: Performance of 15-Year-Old Students in Mathematical, Scientific and Reading Literacy in PISA 2012

Mathematics			Science			Reading		
Countries / Regions	Mean	S.E.	Countries / Regions	Mean	S.E.	Countries / Regions	Mean	S.E.
Shanghai-China	613	(3.3)	Shanghai-China	580	(3.0)	Shanghai-China	570	(2.9)
Singapore	573	(1.3)	Hong Kong-China	555	(2.6)	Hong Kong-China	545	(2.8)
Hong Kong-China	561	(3.2)	Singapore	551	(1.5)	Singapore	542	(1.4)
Chinese Taipei	560	(3.3)	Japan	547	(3.6)	Japan	538	(3.7)
Korea	554	(4.6)	Finland	545	(2.2)	Korea	536	(3.9)
Macao-China	538	(1.0)	Estonia	541	(1.9)	Finland	524	(2.4)
Japan	536	(3.6)	Korea	538	(3.7)	Ireland	523	(2.6)
Liechtenstein	535	(4.0)	Vietnam	528	(4.3)	Chinese Taipei	523	(3.0)
Switzerland	531	(3.0)	Poland	526	(3.1)	Canada	523	(1.9)
Netherlands	523	(3.5)	Canada	525	(1.9)	Poland	518	(3.1)
Estonia	521	(2.0)	Liechtenstein	525	(3.5)	Estonia	516	(2.0)
Finland	519	(1.9)	Germany	524	(3.0)	Liechtenstein	516	(4.1)
Canada	518	(1.8)	Chinese Taipei	523	(2.3)	New Zealand	512	(2.4)
Poland	518	(3.6)	Netherlands	522	(3.5)	Australia	512	(1.6)
Belgium	515	(2.1)	Ireland	522	(2.5)	Netherlands	511	(3.5)
Germany	514	(2.9)	Australia	521	(1.8)	Belgium	509	(2.2)
Vietnam	511	(4.8)	Macao-China	521	(0.8)	Switzerland	509	(2.6)
Austria	506	(2.7)	New Zealand	516	(2.1)	Macao-China	509	(0.9)
Australia	504	(1.6)	Switzerland	515	(2.7)	Vietnam	508	(4.4)
Ireland	501	(2.2)	Slovenia	514	(1.3)	Germany	508	(2.8)
Slovenia	501	(1.2)	United Kingdom	514	(3.4)	France	505	(2.8)
Denmark	500	(2.3)	Czech Republic	508	(3.0)	Norway	504	(3.2)
New Zealand	500	(2.2)	Austria	506	(2.7)	United Kingdom	499	(3.5)
Czech Republic	499	(2.9)	Belgium	505	(2.1)	United States	498	(3.7)
France	495	(2.5)	Latvia	502	(2.8)	Denmark	496	(2.6)
United Kingdom	494	(3.3)	France	499	(2.6)	Czech Republic	493	(2.9)
Iceland	493	(1.7)	Denmark	498	(2.7)	Italy	490	(2.0)
Latvia	491	(2.8)	United States	497	(3.8)	Austria	490	(2.8)
Luxembourg	490	(1.1)	Spain	496	(1.8)	Latvia	489	(2.4)
Norway	489	(2.7)	Lithuania	496	(2.6)	Hungary	488	(3.2)
Portugal	487	(3.8)	Norway	495	(3.1)	Spain	488	(1.9)
Italy	485	(2.0)	Hungary	494	(2.9)	Luxembourg	488	(1.5)
Spain	484	(1.9)	Italy	494	(1.9)	Portugal	488	(3.8)
Russian Federation	482	(3.0)	Croatia	491	(3.1)	Israel	486	(5.0)
Slovak Republic	482	(3.4)	Luxembourg	491	(1.3)	Croatia	485	(3.3)
United States	481	(3.6)	Portugal	489	(3.7)	Sweden	483	(3.0)
Lithuania	479	(2.6)	Russian Federation	486	(2.9)	Iceland	483	(1.8)
Sweden	478	(2.3)	Sweden	485	(3.0)	Slovenia	481	(1.2)
Hungary	477	(3.2)	Iceland	478	(2.1)	Lithuania	477	(2.5)
Croatia	471	(3.5)	Slovak Republic	471	(3.6)	Greece	477	(3.3)
Israel	466	(4.7)	Israel	470	(5.0)	Turkey	475	(4.2)
Greece	453	(2.5)	Greece	467	(3.1)	Russian Federation	475	(3.0)
Serbia	449	(3.4)	Turkey	463	(3.9)	Slovak Republic	463	(4.2)
Turkey	448	(4.8)	United Arab Emirates	448	(2.8)	Cyprus	449	(1.2)
Romania	445	(3.8)	Bulgaria	446	(4.8)	Serbia	446	(3.4)
Cyprus	440	(1.1)	Chile	445	(2.9)	United Arab Emirates	442	(2.5)
Bulgaria	439	(4.0)	Serbia	445	(3.4)	Chile	441	(2.9)
United Arab Emirates	434	(2.4)	Thailand	444	(2.9)	Thailand	441	(3.1)
Kazakhstan	432	(3.0)	Romania	439	(3.3)	Costa Rica	441	(3.5)
Thailand	427	(3.4)	Cyprus	438	(1.2)	Romania	438	(4.0)
Chile	423	(3.1)	Costa Rica	429	(2.9)	Bulgaria	436	(6.0)
Malaysia	421	(3.2)	Kazakhstan	425	(3.0)	Mexico	424	(1.5)
Mexico	413	(1.4)	Malaysia	420	(3.0)	Montenegro	422	(1.2)
Montenegro	410	(1.1)	Uruguay	416	(2.8)	Uruguay	411	(3.2)
Uruguay	409	(2.8)	Mexico	415	(1.3)	Brazil	410	(2.1)
Costa Rica	407	(3.0)	Montenegro	410	(1.1)	Tunisia	404	(4.5)
Albania	394	(2.0)	Jordan	409	(3.1)	Colombia	403	(3.4)
Brazil	391	(2.1)	Argentina	406	(3.9)	Jordan	399	(3.6)
Argentina	388	(3.5)	Brazil	405	(2.1)	Malaysia	398	(3.3)
Tunisia	388	(3.9)	Colombia	399	(3.1)	Indonesia	396	(4.2)
Jordan	386	(3.1)	Tunisia	398	(3.5)	Argentina	396	(3.7)
Colombia	376	(2.9)	Albania	397	(2.4)	Albania	394	(3.2)
Qatar	376	(0.8)	Qatar	384	(0.7)	Kazakhstan	393	(2.7)
Indonesia	375	(4.0)	Indonesia	382	(3.8)	Qatar	388	(0.8)
Peru	368	(3.7)	Peru	373	(3.6)	Peru	384	(4.3)
<i>OECD average</i>	<i>494</i>	<i>(0.5)</i>	<i>OECD average</i>	<i>501</i>	<i>(0.5)</i>	<i>OECD average</i>	<i>496</i>	<i>(0.5)</i>

Note: Shaded area indicates scores significantly different from those of Hong Kong.

Appendix 2: Performance in Mathematics and the Impact of Socio-economic Background

Average performance of countries/regions on the PISA Mathematics scale and the relationship between performance and the index of economic, social and cultural status

- ◆ Strength of the relationship between performance and socio-economic status is above the OECD average
- ◇ Strength of the relationship between performance and socio-economic status is not statistically significantly different from the OECD average
- ◆ Strength of the relationship between performance and socio-economic status is below the OECD average

