Accomplishments and Challenges

Results from HKPISA 2006

Esther Sui-chu HO

Director, HKPISA Centre

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1

Overview

- Overall Performance
- Performance Disparity among subgroups
    - high vs low SES
    - boys vs girls
    - immigrants vs local
- Factors related to performance
- Policy concerns
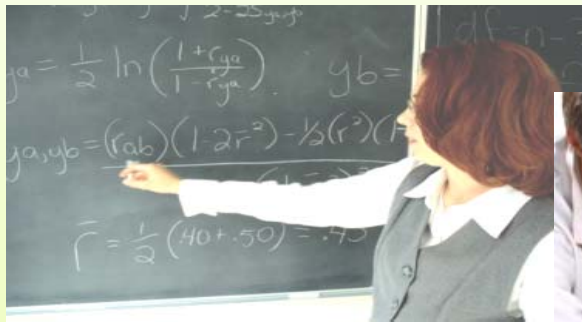- Concluding Remarks
    – accomplishments and challenges

Basic Background

- Tests competencies for real-life situations *and* not constrained by the common denominator of national curricula

- Three Domains:

Reading

Mathematics

Science

OECD/PISA Project 2006

Countries participating in the OECD PISA Project 2006:

Western Europe	Asia/Pacific Rim	Eastern Europe	Americas & others
Austria	Australia	Bulgaria	Argentina
Belgium	Hong Kong - China	Czech Republic	Brazil
Denmark	Indonesia	Croatia	Canada
Finland	Japan	Estonia	Chile
France	Korea	Greece	Colombia
Germany	Macao - China	Hungary	Israel
Iceland	New Zealand	Jordan	Mexico
Ireland	Chinese Taipei	Latvia	United States
Italy	Thailand	Lithuania	Uruguay
Luxembourg		Poland	Tunisia
Netherlands		Russian Federation	
Norway		Serbia – Montenegro	
Portugal		Slovak Republic	
Spain		Slovenia	
Sweden		Turkey	
Switzerland			
United Kingdom			

OECD
PISA

OECD Programme for International Student Assessment
Monitoring Knowledge and Skills in the New Millennium

OCED/PISA 2006

Explicit Strata	Implicit Strata	Total Number of Schools	Number of Schools sampled by OECD	Number of Schools Accepted by OECD
Government	High Ability	17	6	**6**
	Medium Ability	7	2	**2**
	Low Ability	10	3	**3**
	N/A	2	0	**0**
Aided	High Ability	128	48	**46**
	Medium Ability	125	47	**46**
	Low Ability	126	37	**35**
	N/A	1	0	**0**
Independent#	Local (DSS*)	43	8	**7**
	International	27	5	**1**
Total		486	156	**146**

OECD/PISA 2006

Table 4.2 Distribution of Students Participating in the Main Study of HKPISA 2006

	Number of Participating Students	Proportion (%)
Graded/Form		
7/S1	107	2.3
8/S2	421	9.1
9/S3	1134	24.4
10/S4	2978	64.1
11/S5	5	0.1
Total	**4645**	**100**
Sex		
Female	2351	50.6
Male	2294	49.4
Total	**4645**	**100**

TOP Ten Countries/ Regions in PISA2006 (Figure 1)

Science			Mathematics			Reading		
Countries	*Mean*	*S.E.*	*Countries*	*Mean*	*S.E.*	*Countries*	*Mean*	*S.E.*
Finland	563	(2.0)	Chinese Taipei	549	(4.1)	Korea	556	(3.8)
Hong Kong	542	(2.5)	Finland	548	(2.3)	Finland	547	(2.1)
Canada	534	(2.0)	Hong Kong	547	(2.7)	Hong Kong	536	(2.4)
Chinese Taipei	532	(3.6)	Korea	547	(3.8)	Canada	527	(2.4)
Estonia	531	(2.5)	Netherlands	531	(2.6)	New Zealand	521	(3.0)
Japan	531	(3.4)	Switzerland	530	(3.2)	Ireland	517	(3.5)
New Zealand	530	(2.7)	Canada	527	(2.0)	Australia	513	(2.1)
Australia	527	(2.3)	Macao-China	525	(1.3)	Liechtenstein	510	(3.9)
Netherlands	525	(2.7)	Liechtenstein	525	(4.2)	Poland	508	(2.8)
Liechtenstein	522	(4.1)	Japan	523	(3.3)	Sweden	507	(3.4)
OECD average	500	(0.5)	OECD average	498	(0.5)	OECD average	492	(0.6)

7

Change from PISA2000+, 2003 to 2006

Table 5.2.1 Mean Scores Comparisons in Science, Mathematics and Reading from PISA2000+, 2003 to 2006

	Science		Mathematics		Reading	
Year	Mean	S.E.	Mean	S.E.	Mean	S.E.
2000+	(541)	3.0	(560)	3.3	525	2.9
2003	(539)	4.3	550	4.5	510	3.7
2006	542	2.5	547	2.7	536**	2.4

** Reading Performance Improved substantially in 2006 indicate significant differences between performance in 2006 vs 2003 and 2000+

Change In Reading

Table 5.2.2 Percentile comparison of reading in 2000+, 2003 and 2006

Percentile	2000+		2003		2006		2006-2000	2006-2003
	Mean	SE	Mean	SE	Mean	SE	Difference	Difference
5th	369	8.9	355	9.8	390	6	**21**	**35**
10th	413	7.2	396	7	426	5.7	13	**30**
25th	477	3.6	461	5.2	484	3.8	7	**23**
50th	534	2.7	519	3.4	543	2.6	9	**24**
75th	584	2.8	569	2.7	594	2.4	10	**25**
90th	624	3.1	608	2.8	636	2.7	**12**	**28**
95th	646	4.1	630	3	660	2.5	**14**	**30**
Average	525	2.9	510	3.7	536	2.4	**11**	**26**

* Difference that at statistically significant at 95 percent confidence level are indicated in bold

Proficiency Levels in Science

Table 5.4.1 Summary Descriptions for Six Levels of Overall Scientific Literacy

Level	Scores[1]	(OECD average % of students able to perform tasks at each level or above)
6	above 707.93	1.3%
5	633.33 to 707.93	9.0%
4	558.73 to 633.33	29.3%
3	484.14 to 558.73	56.7%
2	409.54 to 484.14	80.8%
1	334.94 to 409.54	94.8%

At Level 6, students can consistently identify, explain and apply scientific knowledge and knowledge about science in a variety of complex life situations.

Level 2 is the baseline level, at which students begin to demonstrate the science competencies that will enable them to participate actively in life situation related to science and technology

At Level 1, students have such a limited scientific knowledge that it can only be applied to a few, familiar situations. They can present scientific explanations that are obvious and follow explicitly from given evidence.

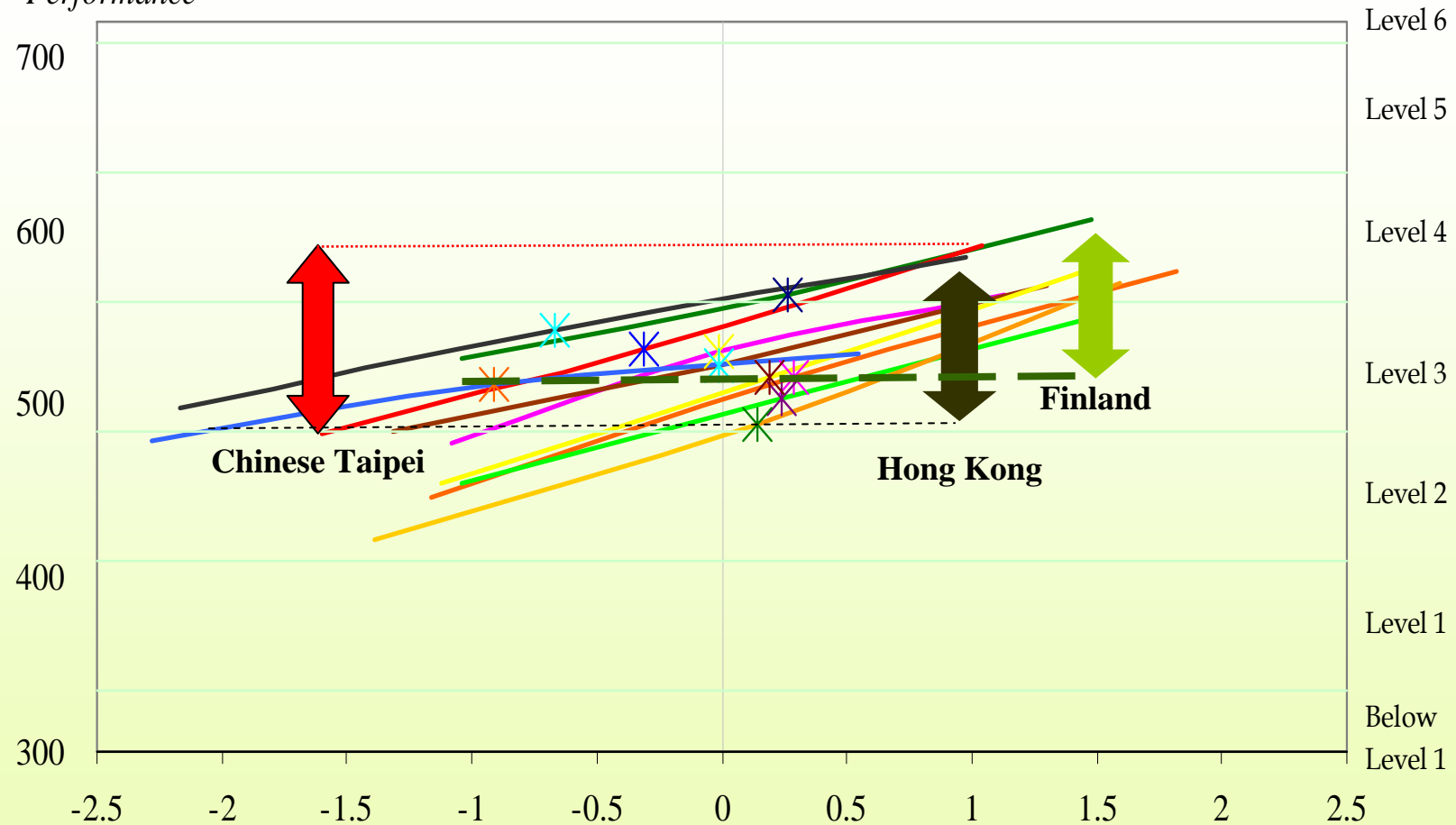# Science Proficiency Levels among Asian Societies
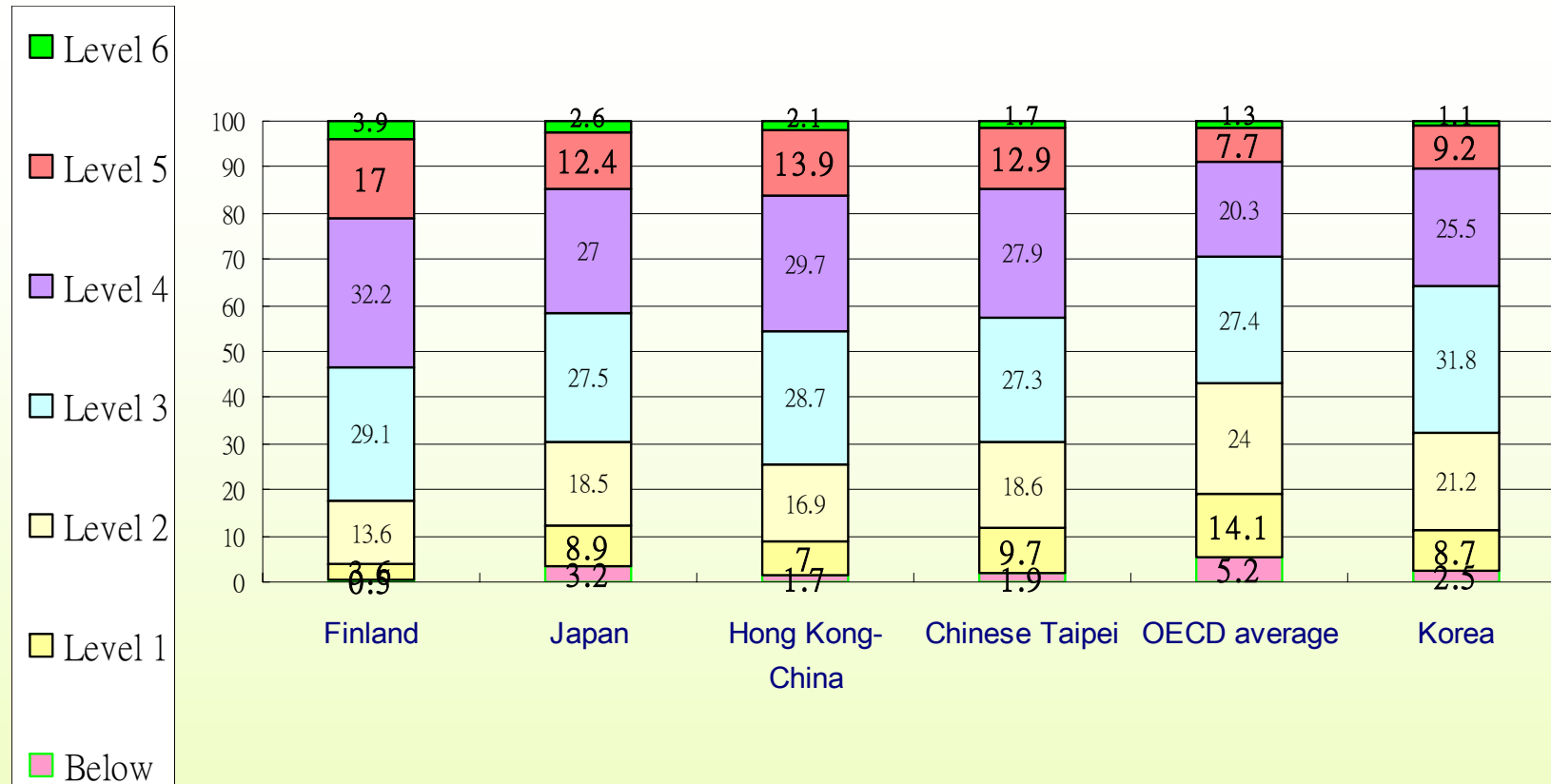
Hong Kong has 16% of students reach level 5 or above which is higher than other Asian Societies (Japan 15%; Chinese Taipei, 14.6%; Korea, 10.3%)

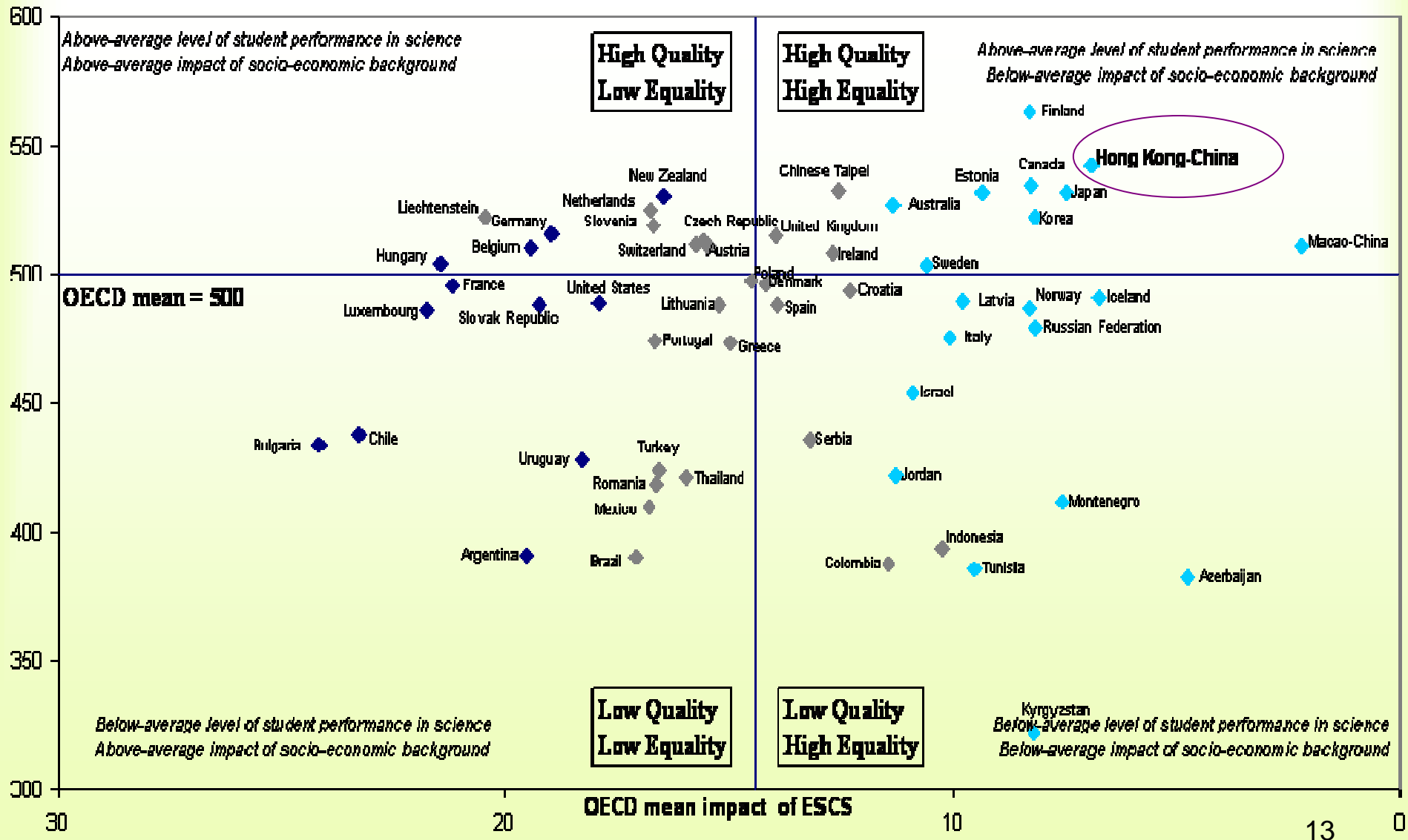# Quality and Equality of Hong Kong Secondary School System (PISA 2006)

Finland ── Germany ── Japan ── Korea ── Sweden ── UK ── USA ── Taipei ── Hong Kong ── Macao

Performance

Index of Economic, Social and Cultural Status (ESCS)

Chinese Taipei

Hong Kong

Finland

12

Figure 2. Quality and Equality

13

Figure 3. Disparity between Boys and Girls

Significant Gender Difference in Reading and Mathematics

	HKPISA 2000+	HKPISA 2003	HKPISA 2006
Science	9	-3	7
Reading	-16*	-32*	-31*
Mathematics	18*	4	16*
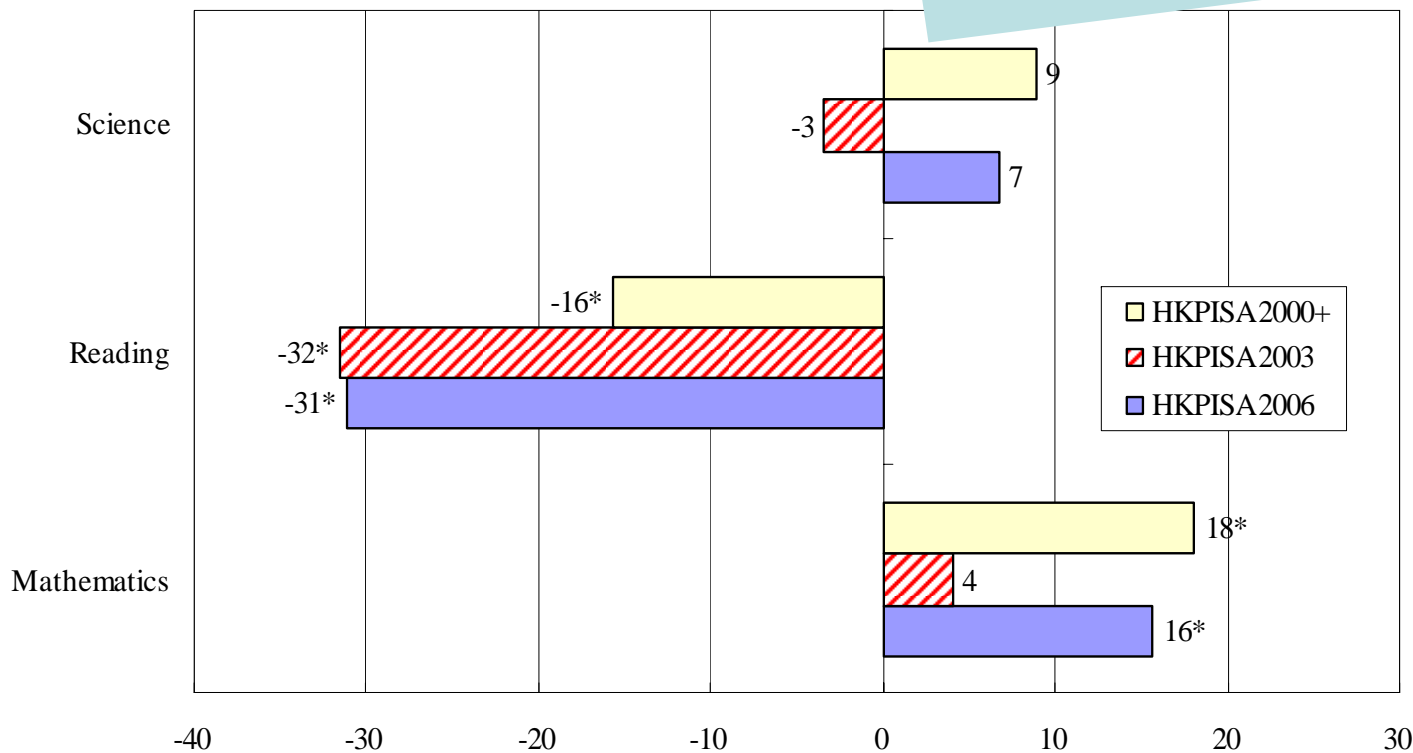
Females Perform Better ←→ Males Perform Better

* Note: Values that are statistically significant are indicated in **bold**

14

Immigrant Students in Hong Kong

- **Native Students**: Students born in the country/ with at least one parent born in the country (55%)

- **Second Generation**: Students born in the country with foreign-born parents (24.4%)

- **First Generation (foreign born)**: Students born outside of the country with foreign-born parents (18.7%)

Disparity between immigrants and local students (Hong Kong vs OECD)

Hong Kong	Native		Second Generation		First Generation	
	Mean	SE	Mean	SE	Mean	SE
Science	547	3.0	551	3.6	521	4.9
Mathematics	554	3.1	555	3.9	521	4.8
Reading	539	2.8	547	3.2	516	4.5
OECD average	Mean	SE	Mean	SE	Mean	SE
Science	506	0.5	466	2.2	453	2.1
Mathematics	503	0.5	473	2.1	457	1.9
Reading	498	0.6	457	3.2	448	2.3

# Figure 4. Performance of Students by Immigrant Status

First generation students perform significantly lower than the second generation and native students in all the three domains)
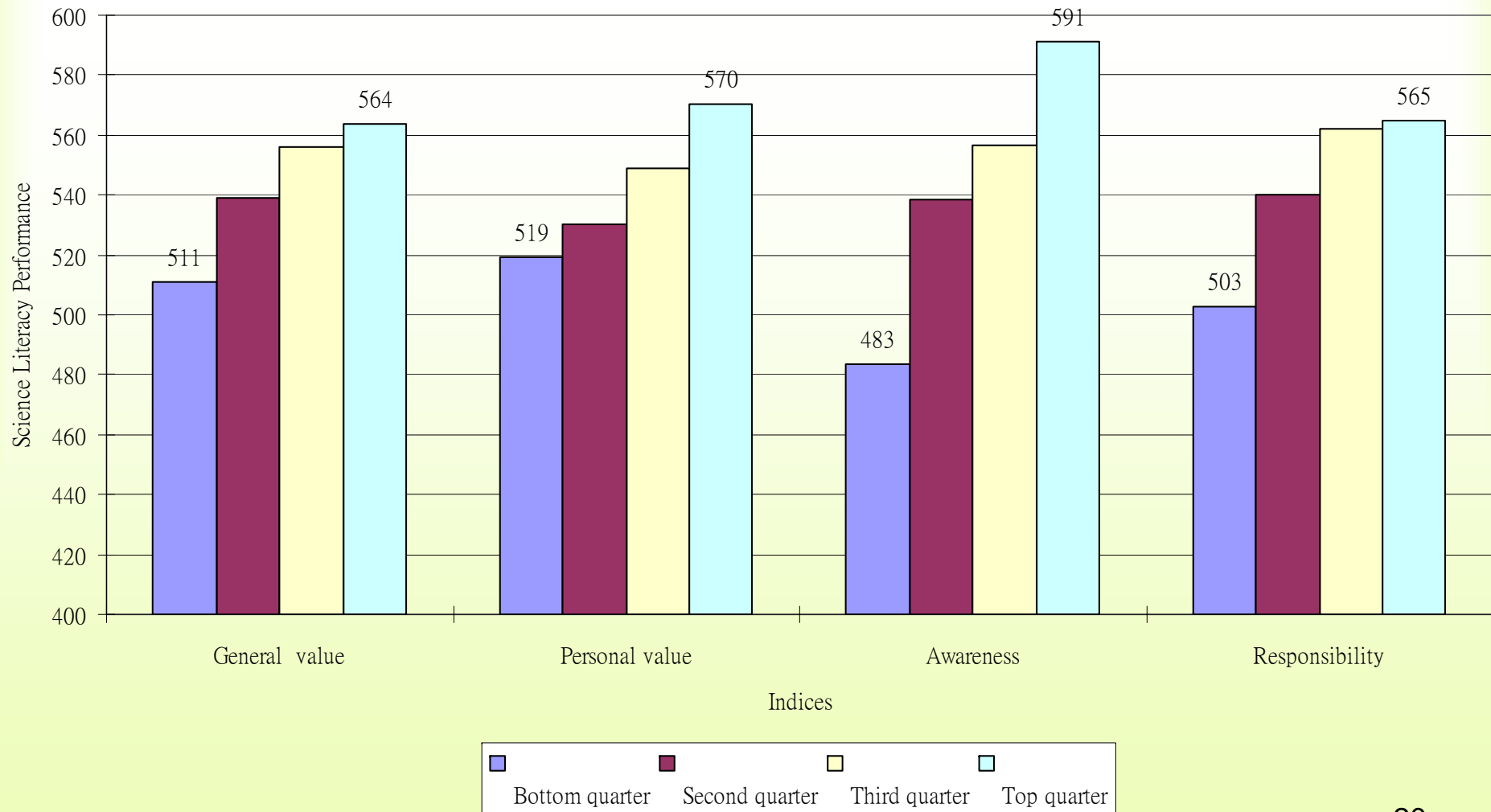

17
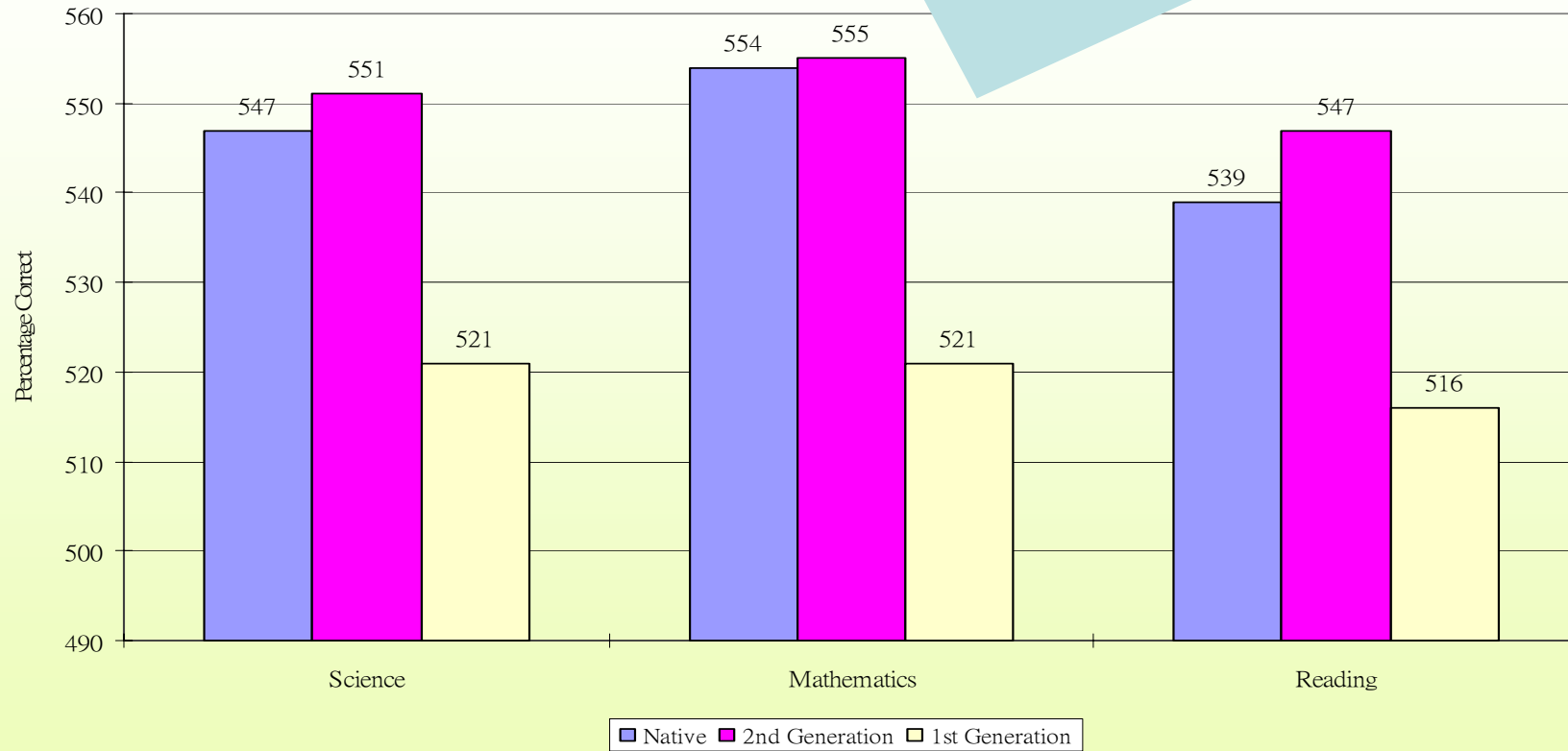
Percentage of Immigrant students by Grade

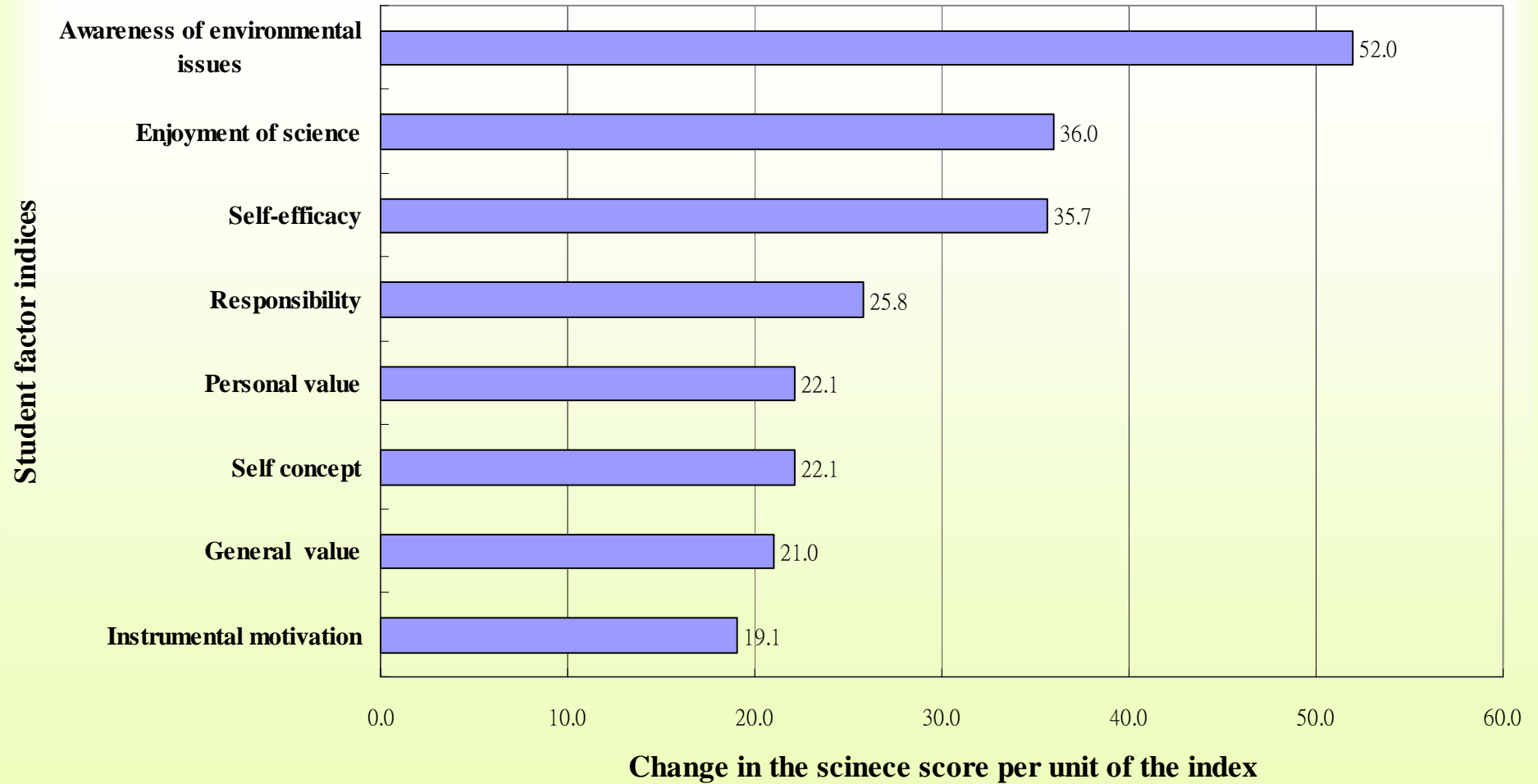| Grade		Native Students	Second-Generation Students	First-Generation Students
7	Number of student	14	3	89
	% within Grade	13%	3%	84%
8	Number of student	93	41	281
	% within Grade	22%	10%	68%
9	Number of student	552	253	319
	% within Grade	49%	23%	28%
10	Number of student	1933	848	185
	% within Grade	65%	29%	6%
11	Number of student	3	1	1
	% within Grade	60%	20%	20%
Total	Number of student	2595	1146	875
	% within Grade	56%	25%	19%

Figure 5. Self-belief and Motivation & Science Performance
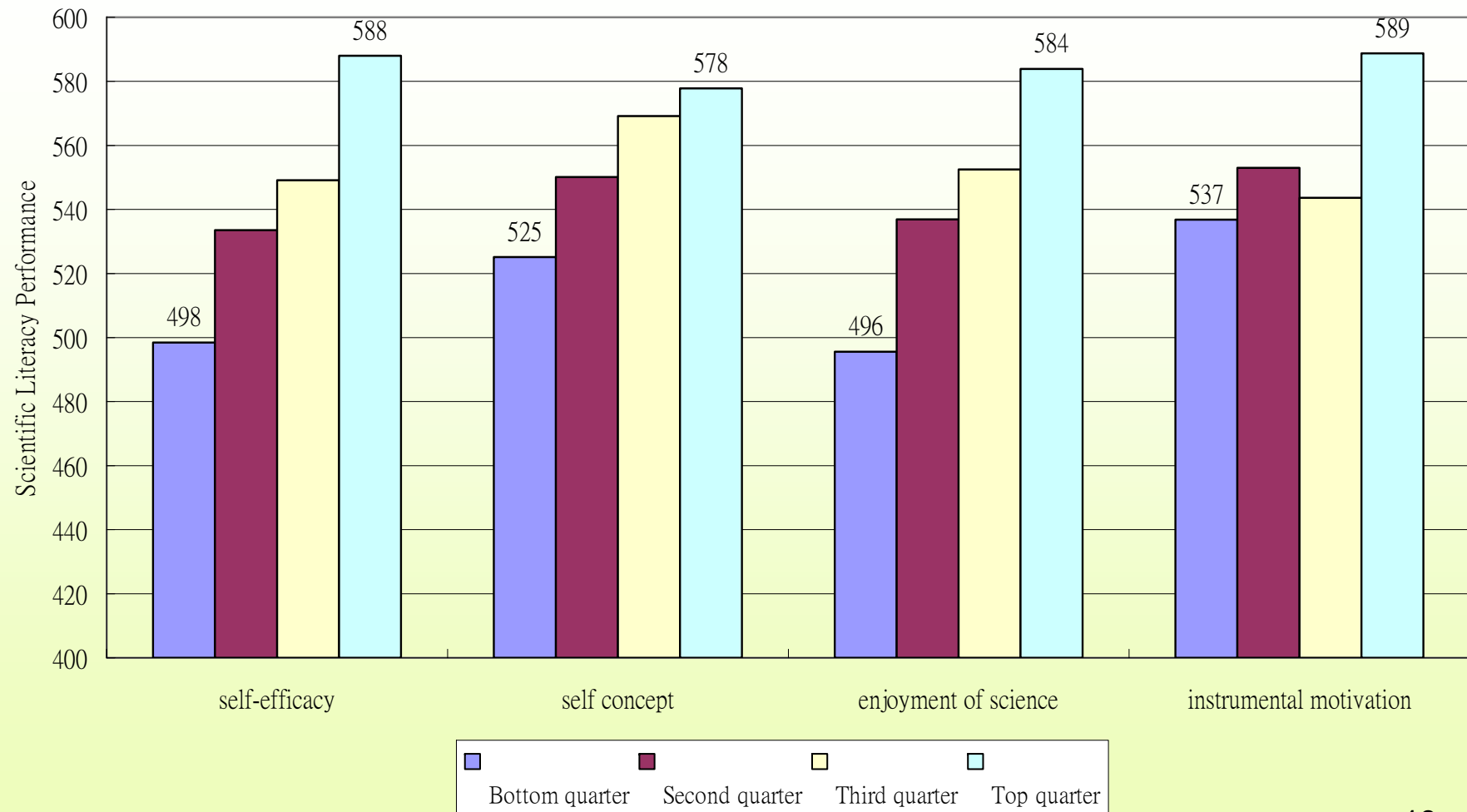
Figure 6. Value of Science and Concern on Environmental Issues

Relative Effect of Student Factors

Chart showing change in the science score per unit of the index for various student factor indices:

- Awareness of environmental issues: 52.0
- Enjoyment of science: 36.0
- Self-efficacy: 35.7
- Responsibility: 25.8
- Personal value: 22.1
- Self concept: 22.1
- General value: 21.0
- Instrumental motivation: 19.1
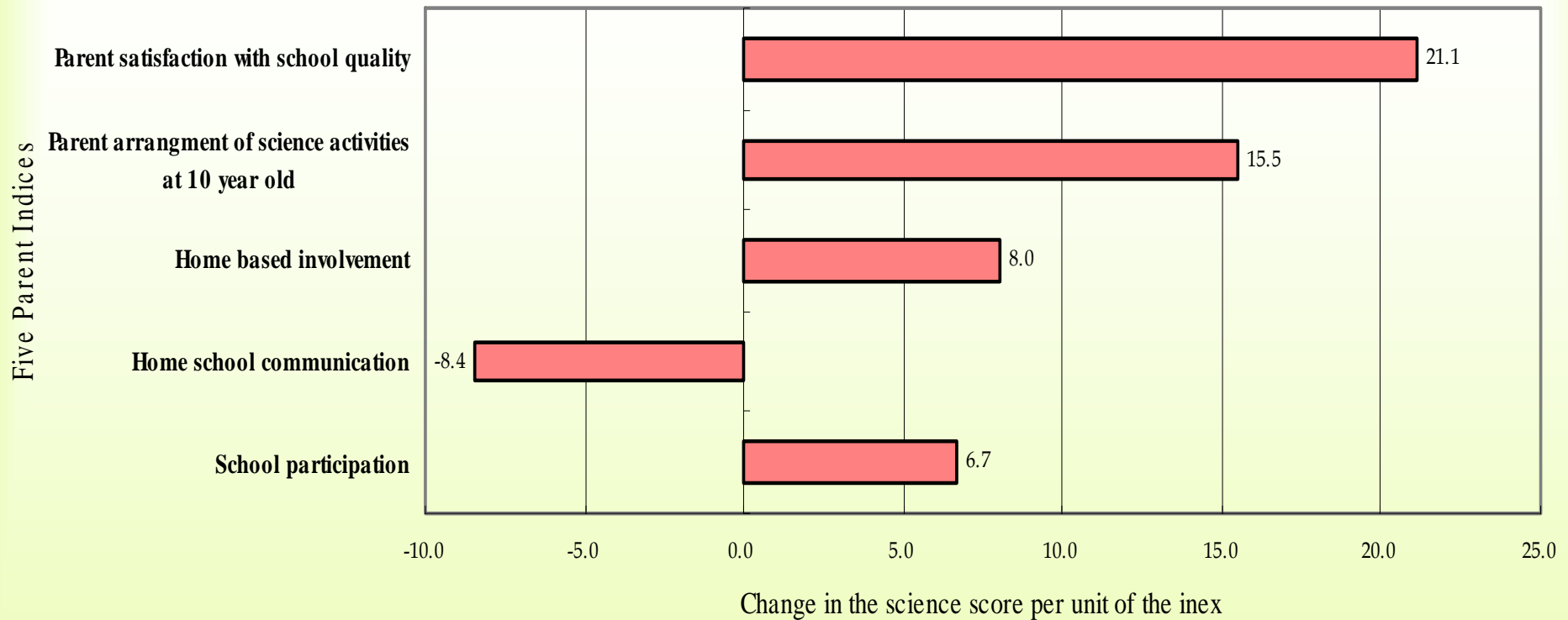
X-axis: Change in the scinece score per unit of the index
Y-axis: Student factor indices

Figure 7. Parent Factors and Science Performance
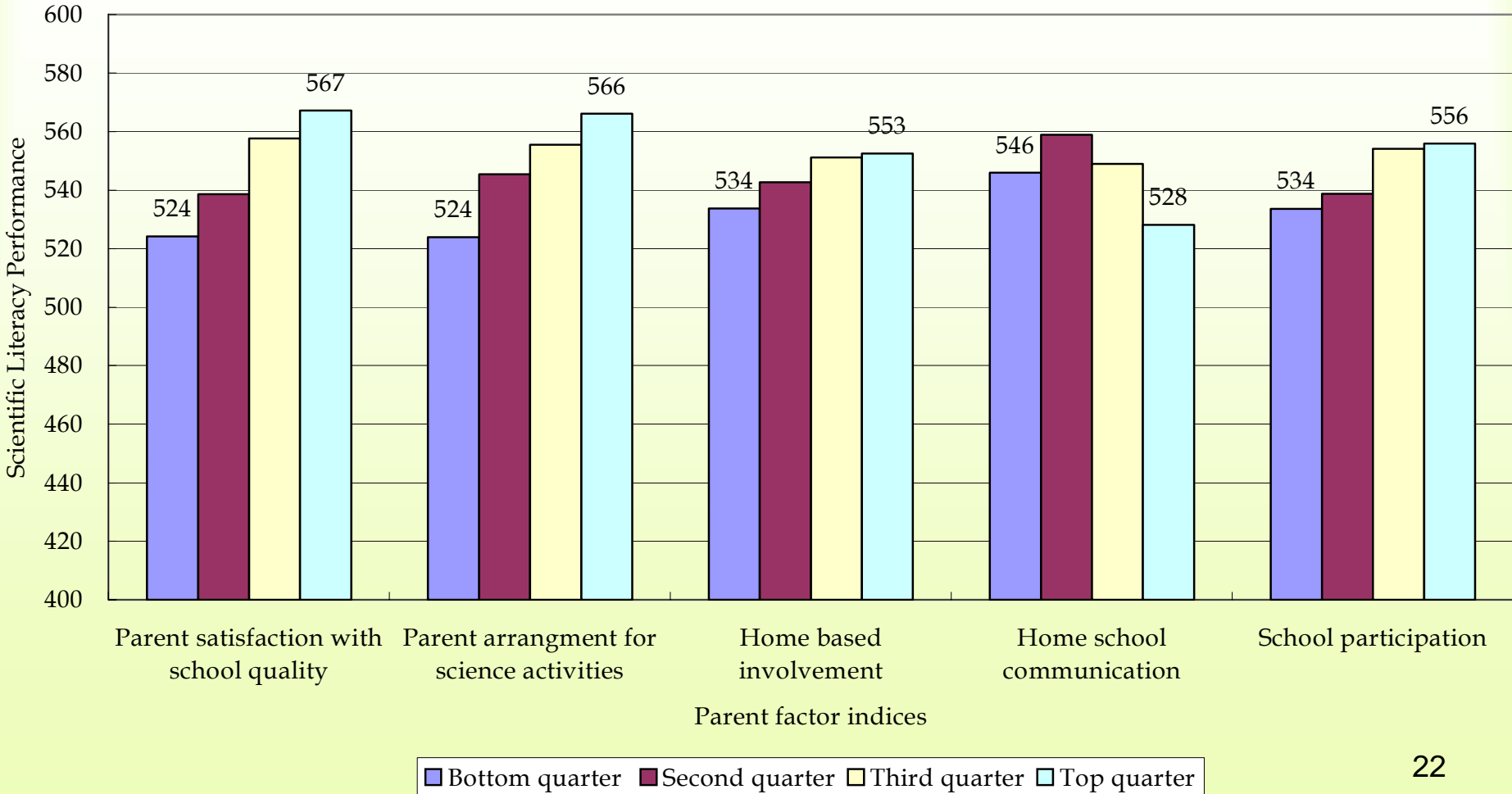
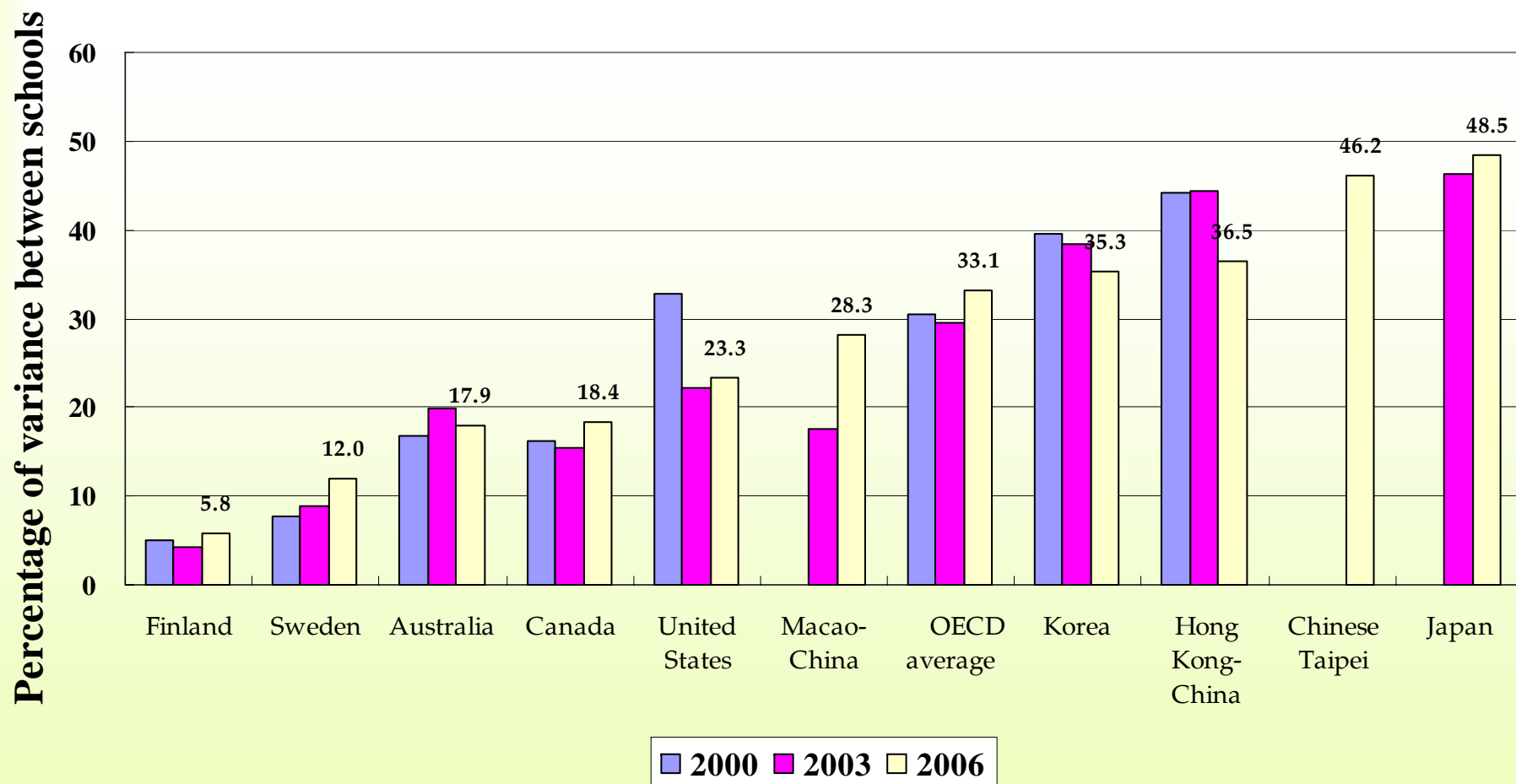# Relative Effect of Parent Factors

Policy Concern

- School Academic Segregation
- Educational Expenditure
- Medium of Instruction

Figure 8. School Academic Segregation over Three Cycles

Possible explanation -
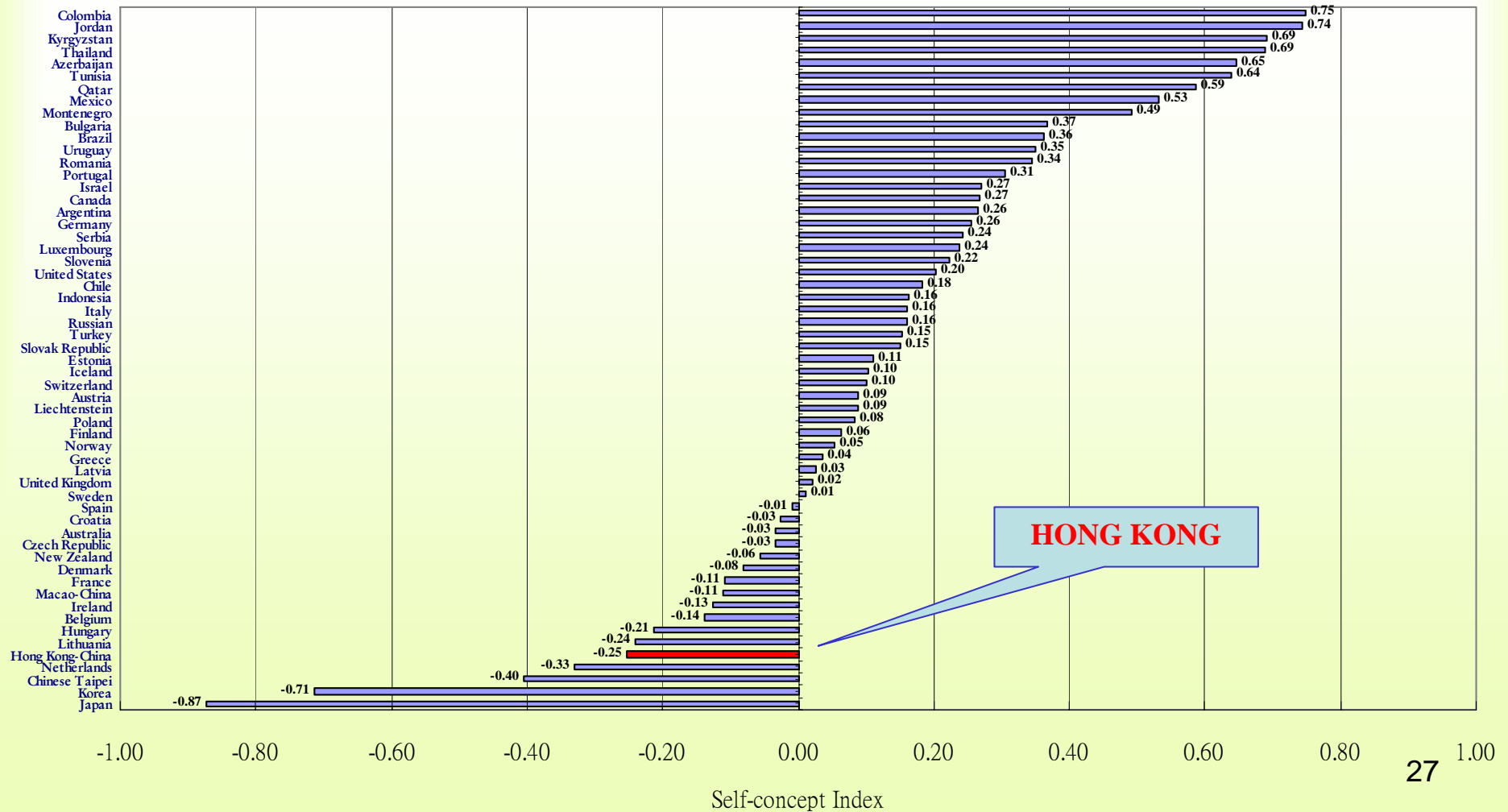# between school variance

- Difference in student academic intake:

  Evidence : between school variance in AAI= (129/129+76)= 63%

- Both student AAI and school mean AAI have significant associations with Science performance

- AAI at the two level explained 89.8% of the between school variance.

- School Intake have the strongest impact on the variation of science performance between schools.

Possible Impact-
Self-concept in Science

Self-concept in Science

Education Expenditure – Creation of Human Capital

Science performance vs Cumulative expenditure (US$ converted using PPPs)

($64519, Score 563)

($43105, Score 542)

Hong Kong

Finland

Japan

New Zealand Australia

Korea Germany Netherlands

Czech Republic United Kingdom Switzerland

Belgium Austria

Ireland

Hungary Sweden

Poland France Denmark United States

Slovak Republic Spain Iceland

Greece Portugal Italy Norway

Turkey

Mexico

y = 0.0006x + 462
R² = 0.1904

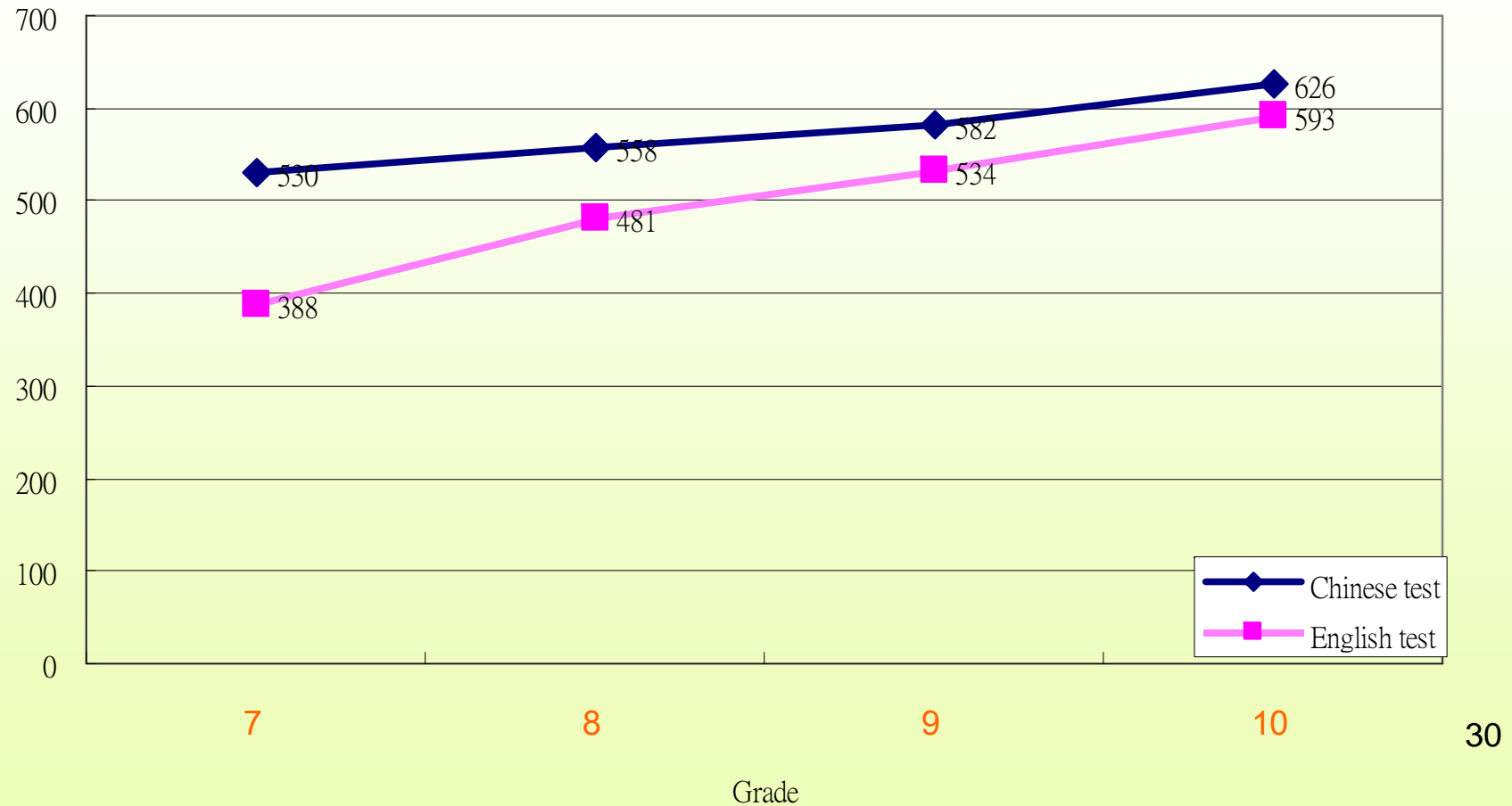Cumulative expenditure (US$ converted using PPPs) 28

Science Performance by Test Language (34 EMI schools)

PISA2006 Science Performance by Test Language
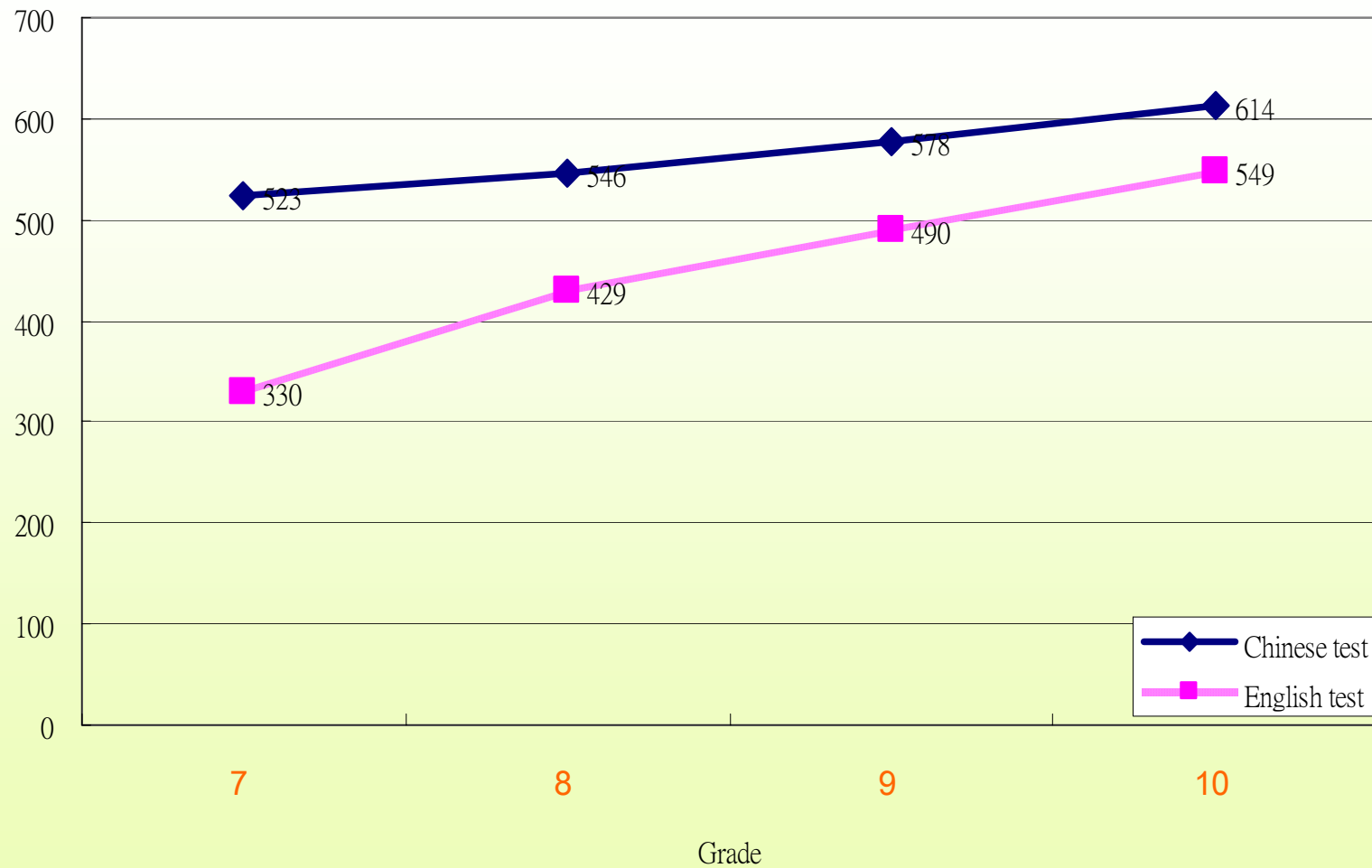
Math Performance by Test Language (34 EMI schools)

PISA2006 Mathematics Performance by Test Language

Reading Performance by Test Language (34 EMI schools)

PISA2006 Reading Performance by Test Language
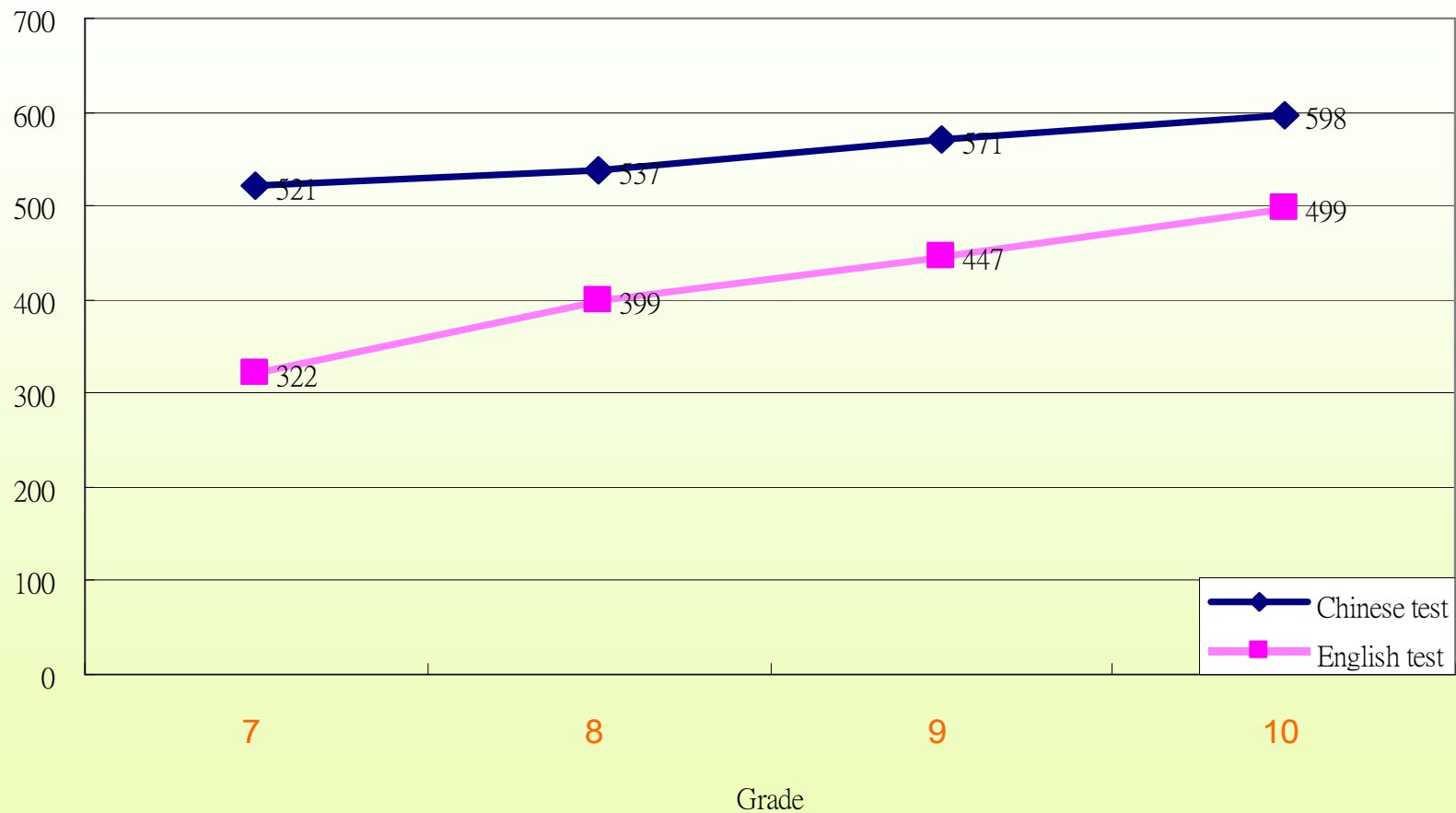
Comparison for 34 EMI schools

PISA2006 - Test Lanuguage comparision for 34 schools

Domains	Chinese test > English test	No Sign Difference
Science	31/34 schools	3/34 schools
Reading	29/34 schools	5/34 schools
Math	14/34 schools	20/34 schools

Conclusion

- Quality: Consistent High Achievement but
  Low Self-concept towards learning
- Equality
  - Class (Gentle Social Gradient)
  - Gender (Boys disadvantage in Reading,
    Girls disadvantage in Math),
  - Immigrant students (Disadvantage of first generation)
- Factors related to performance:
  - Student self-belief. motivation, value of science and engagement in environmental issues
  - Parental Involvement at home and in school
- Policy Concern
  - Academic segregation between schools
  - Educational expenditure (Investment for creation of human capital)
  - Achievement gap between the two test languages (Chinese & English)
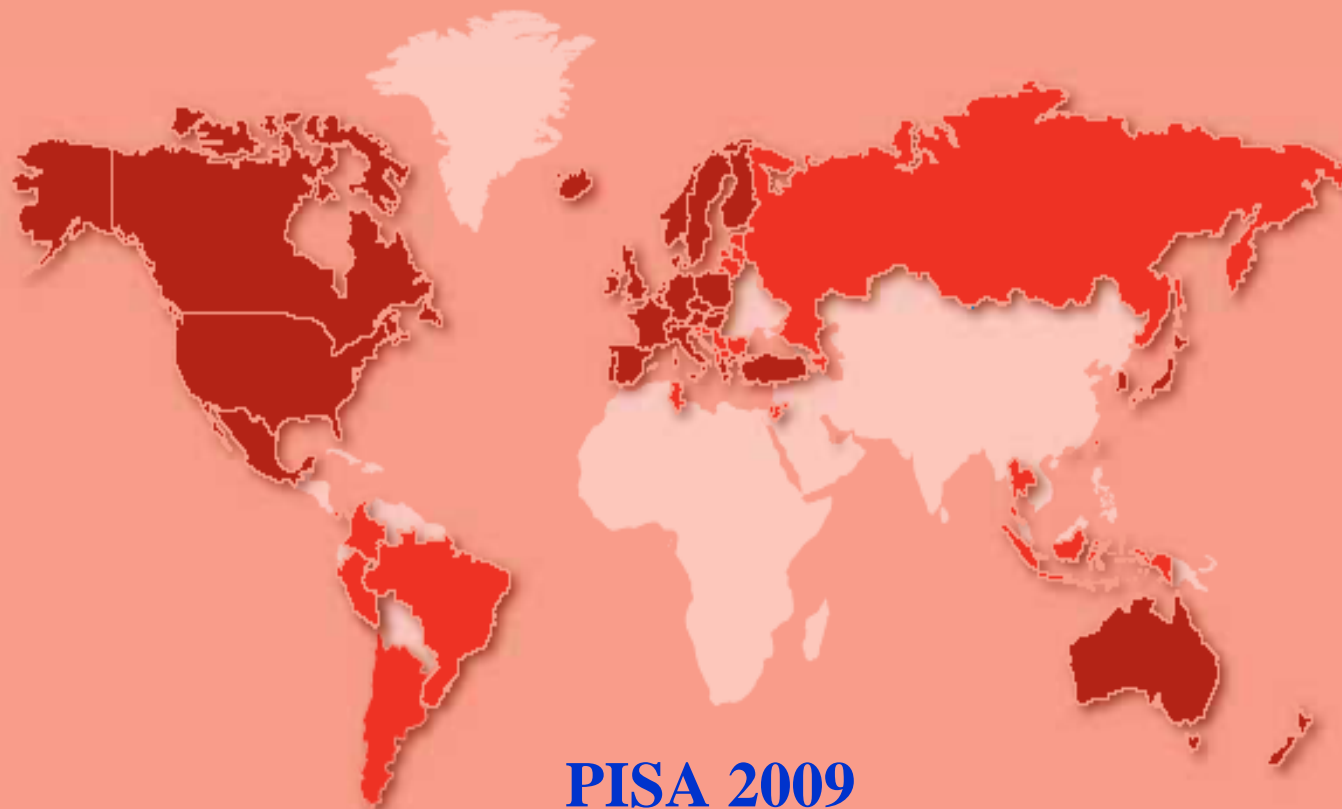
PISA 2009

OECD countries

Australia	Hungary	Norway
Austria	Iceland	Poland
Belgium	Ireland	Portugal
Canada	Italy	Slovak Republic
Czech Republic	Japan	Spain
Denmark	Korea	Sweden
Finland	Luxembourg	Switzerland
France	Mexico	Turkey
Germany	Netherlands	United Kingdom
Greece	New Zealand	United States

PISA partner countries

Albania	Hong Kong-China	Peru
Argentina	Indonesia	Qatar
Azerbaijan	Israel	Republic of Montenegro
Brazil	Jordan	Republic of Serbia
Bulgaria	Kyrgyz Republic	Romania
Chile	Latvia	Russian Federation
China (Shanghai)	Liechtenstein	Singapore
Chinese Taipei	Lithuania	Slovenia
Colombia	Macao-China	Thailand
Croatia	Macedonia	Tunisia
Estonia	Panama	Uruguay

Looking forward…

- **Future PISA assessments**

  Fourth Cycle - PISA2009: Reading + Electronic version , Mathematics, Science

- Future international collaboration

  OECD, Mainland China, Macao & Asian Societies

  Norway for Regional and International Conference

- Future local collaboration

  Workshops and Seminars for Teachers and Researchers
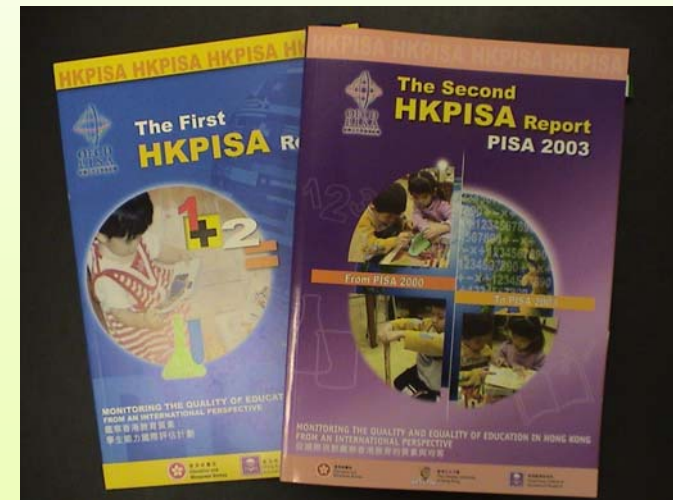
Acknowledgement

- The success of HKPISA 2006 is the result of joint effort and support from school principals, teachers (in particular, the PISA School Coordinators), students and their parents, and Education Bureau of the HKSAR Government.

- Our deepest gratitude to the schools participated in HKPISA 2006!
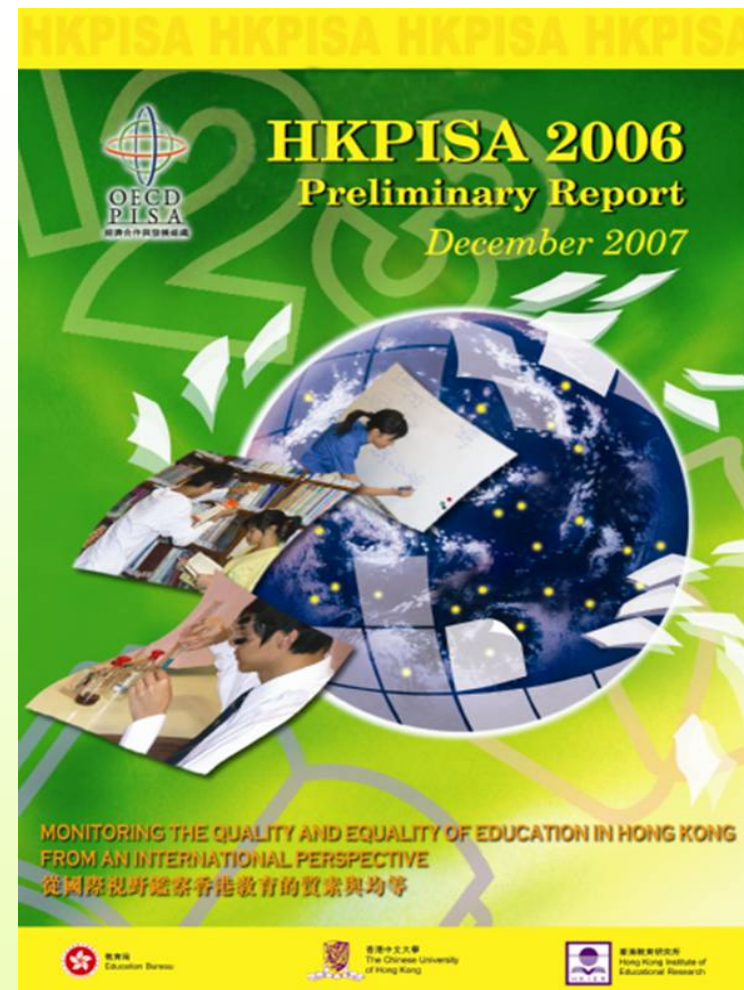
Thank you !

HKPISA

Further information
estherho@cuhk.edu.hk
Tel: (852) 26037216
Fax: (852) 26035336

Visit the websites:
OECD-PISA ：www.pisa.oecd.org
HK-PISA: www.fed.cuhk.edu.hk/~hkpisa

PISA 2006

Disadvantage of First-generation Immigrant Students in Hong Kong

Disadvantage of first generation: Parent factors

Non-Native students tend to have less home resources and parental involvement
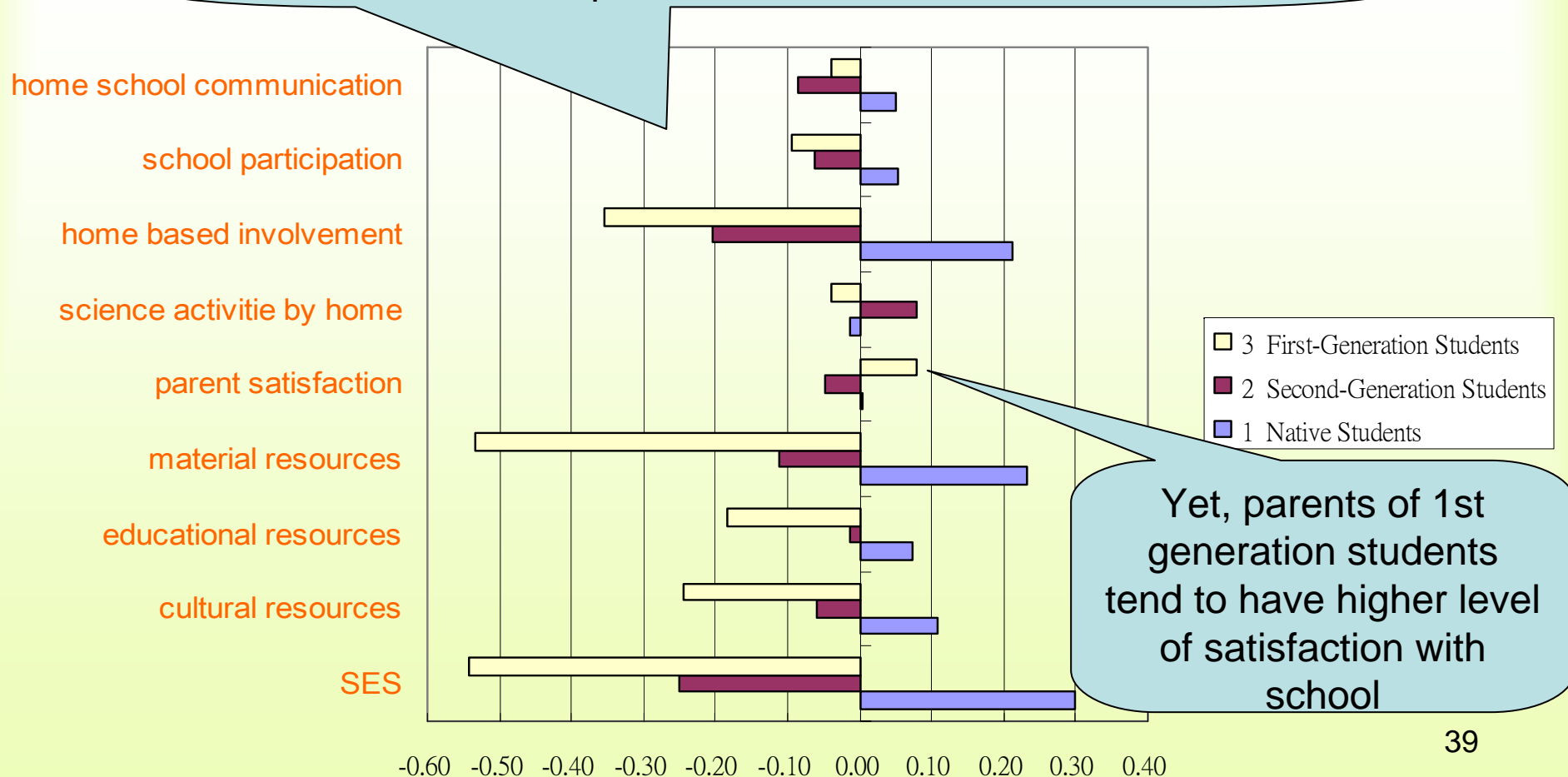
Yet, parents of 1st generation students tend to have higher level of satisfaction with school

home school communication
school participation
home based involvement
science activitie by home
parent satisfaction
material resources
educational resources
cultural resources
SES

☐ 3 First-Generation Students
■ 2 Second-Generation Students
☐ 1 Native Students

-0.60 -0.50 -0.40 -0.30 -0.20 -0.10 0.00 0.10 0.20 0.30 0.40

39

Performance by First Generation by Years arrived HK

Performance by Years Arrived HK for First Generation Students
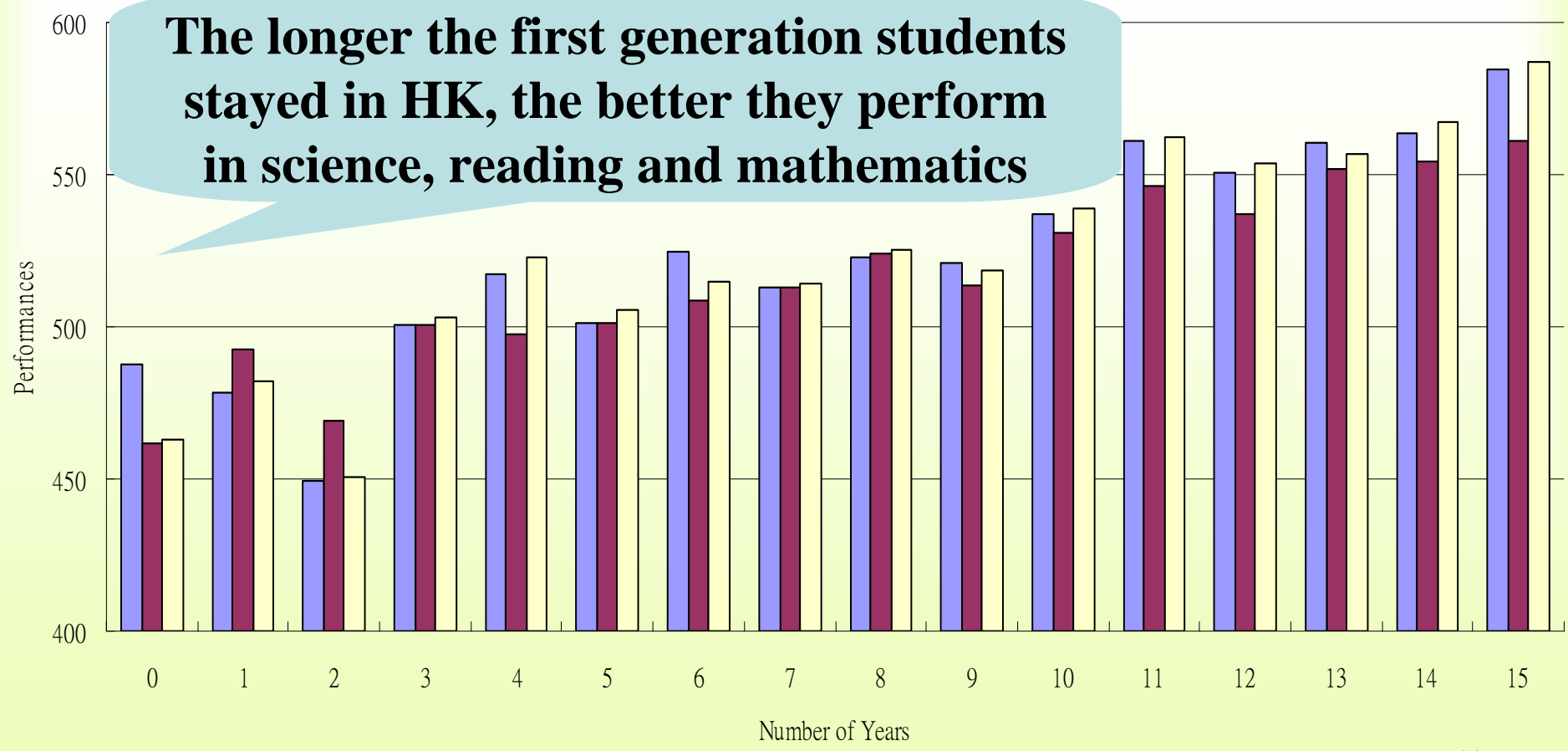
Backup slides

Top and bottom performers in science

42
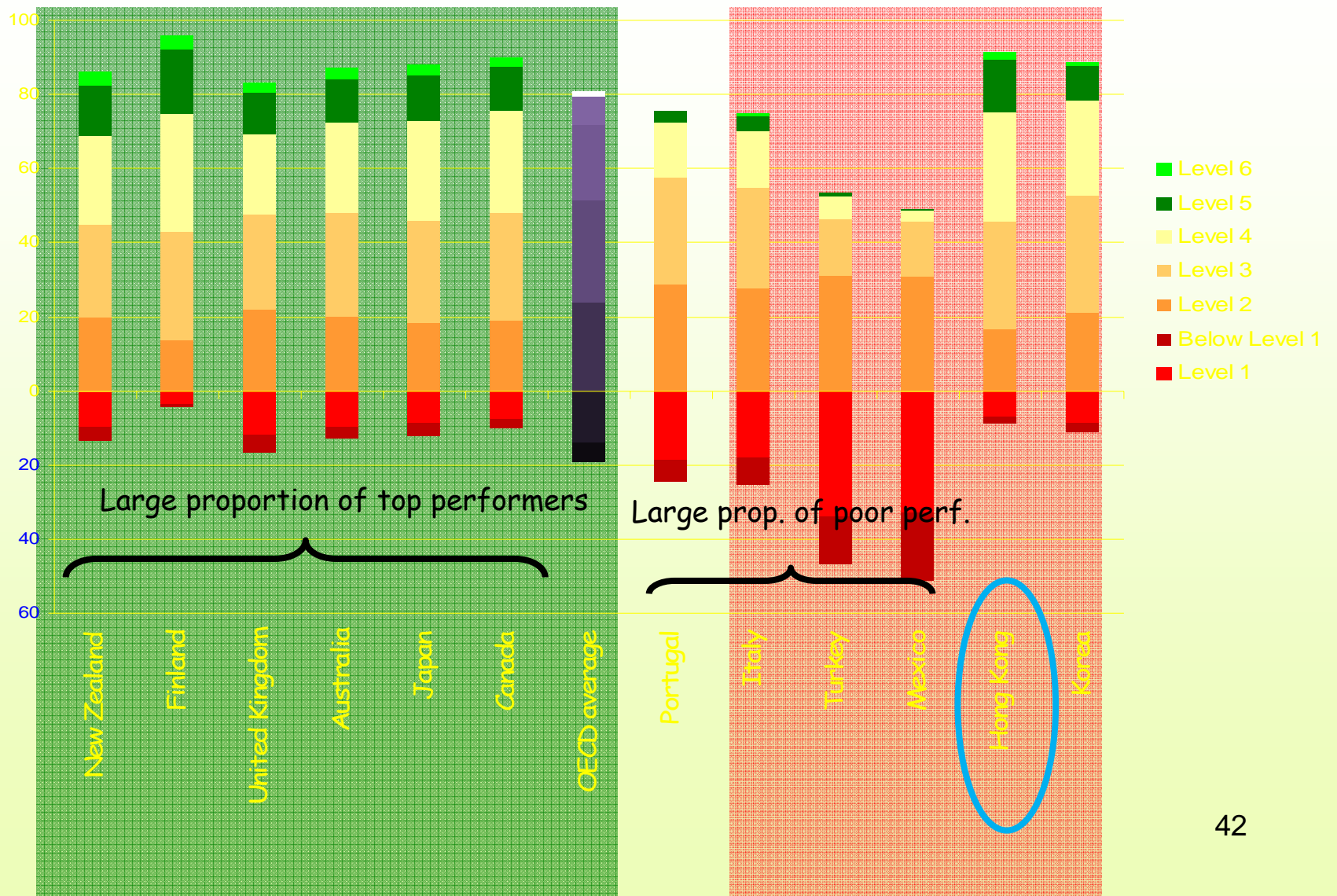
Strengths and Weaknesses of Hong Kong in science
relative to their overall performance

Overall science score
Hong Kong=542

Science competencies

Explaining phenomena scientifically

Using scientific evidence

Knowledge about science

Science knowledge

Earth and space

Living systems

Physical systems

-35   -25   -15   -5   5   15   25   35

43

OECD (2007), *PISA 2006 – Science Competencies for Tomorrow's World,* Figure 2.13
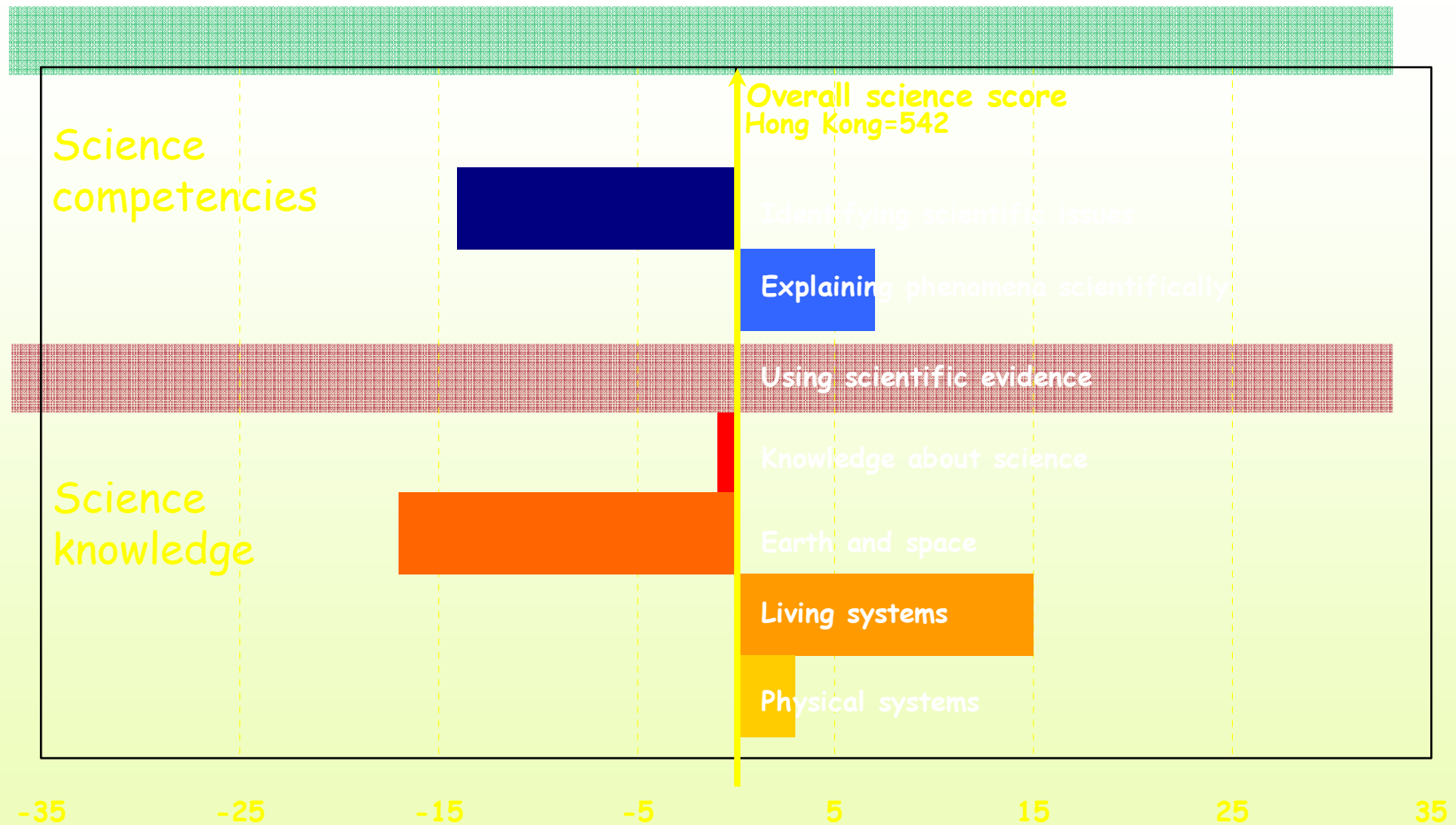
Gender differences in science performance

■ Hong Kong   ■ OECD average

Overall

Girls do better   Boys do better

Identifying scientific issues

Explaining phenomena scientifically

Using scientific evidence scale

Knowledge about science scale

Earth and space systems scale

Living systems scale

Physical systems scale

-35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35

PISA score points

44
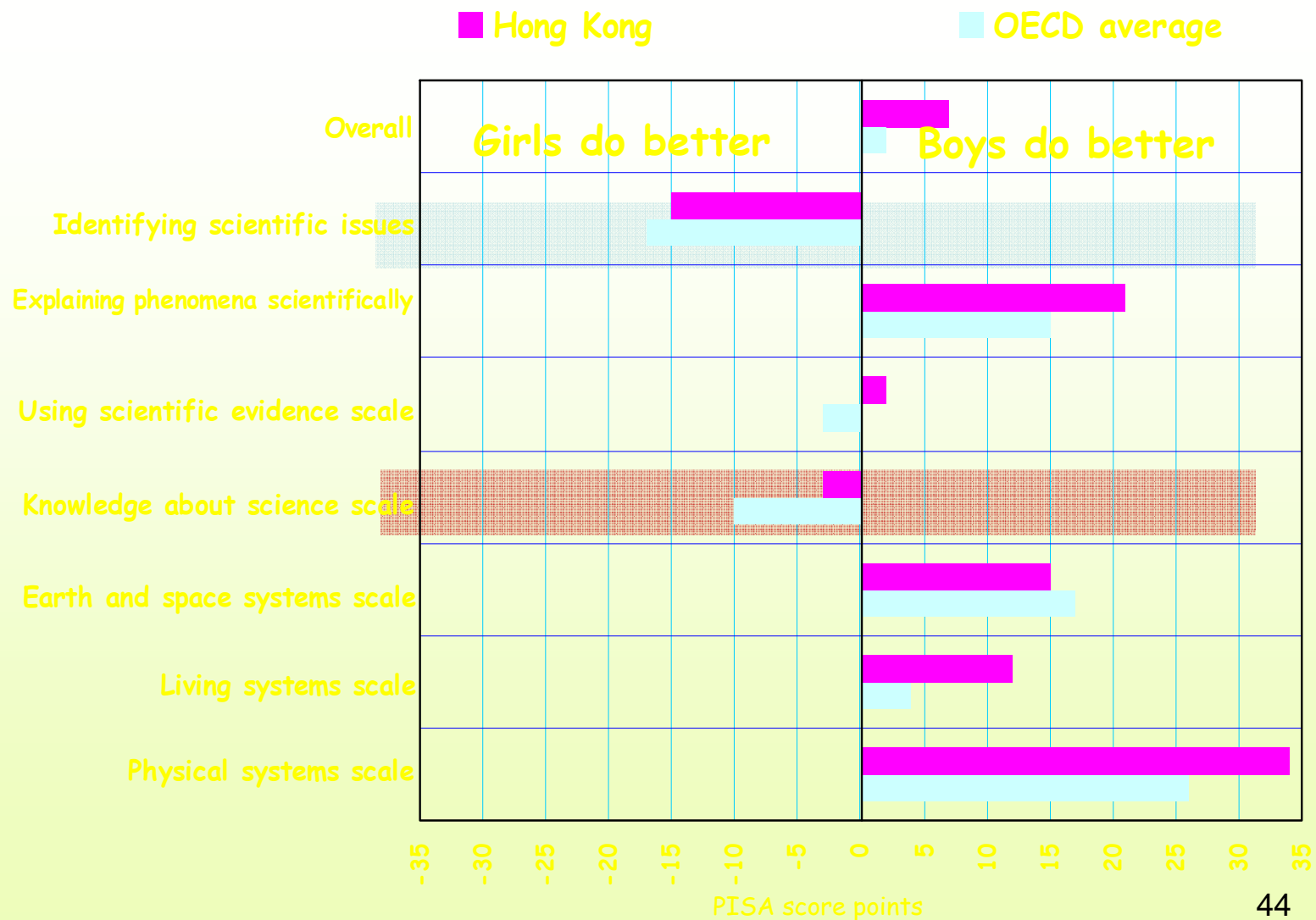
Reading and Mathematics Proficiency levels

Reading Proficiency Levels
Hong Kong vs OECD

Comparison of the Proportion of Students at each Proficiency Level between Hong Kong and OECD Average in PISA 2006

	Hong Kong	OECD Average	Difference (HK - OECD)
Level 5	12.8%	8.6%	4.3% *
Level 4	32.0%	20.7%	11.2% *
Level 3	31.5%	27.8%	3.7% *
Level 2	16.5%	22.7%	-6.2% *
Level 1	5.9%	12.7%	-6.9% *
Below Level 1	1.3%	7.4%	-6.1% *

* Significant at the 0.05 level.

Improvement in Reading
Hong Kong- From 2000+, 2003 & 2006

Proportion of Hong Kong Students at each Proficiency Level in PISA 2006, PISA 2003 and PISA+

	PISA 2006	PISA 2003	PISA2000+	Difference	
				2006-2003	2006-2000+[#]
Level 5	12.8%	5.7%	9.5%	7.1% *	3.3% *
Level 4	32.0%	27.1%	31.3%	4.9% *	0.7%
Level 3	31.5%	35.1%	33.1%	-3.6% *	-1.6%
Level 2	16.5%	20.0%	17.1%	-3.5% *	-0.6%
Level 1	5.9%	8.6%	6.5%	-2.7% *	-0.6%
Below Level 1	1.3%	3.4%	2.6%	-2.2% *	-1.3% *

* Significant at the 0.05 level.

The implementation of PISA+ was in February 2002

HK reading performance

Hong Kong have higher % of students reached level 3,4,5 & lower % of students reached level 2 or below than that of OECD avearge

Level 5
Level 4
Level 3
Level 2
Below Level 1
Level 1

OECD 2006
Hong Kong 2006

8.6
20.7
27.8

12.8
32.0
31.5

5.7
27.1
35.1

9.5
31.3
33.1
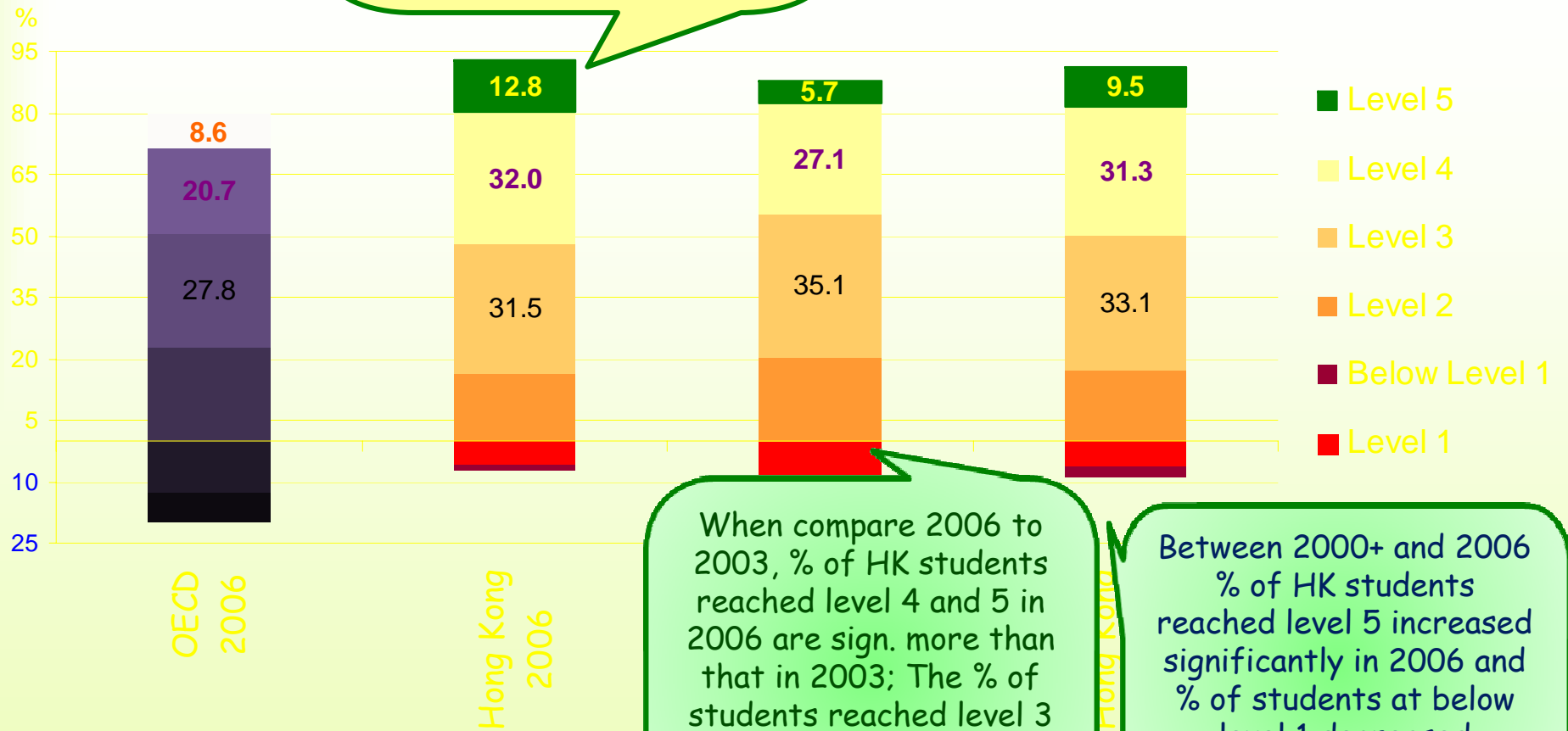
When compare 2006 to 2003, % of HK students reached level 4 and 5 in 2006 are sign. more than that in 2003; The % of students reached level 3 or below in 2006 is sign. Less than thatat 2003

Between 2000+ and 2006 % of HK students reached level 5 increased significantly in 2006 and % of students at below level 1 decreased significantly

48

OECD (2007), *Learning for tomorrow's world: First results from PISA 2006*, Table 6.1a

Math Proficiency Levels -Hong Kong vs OECD

Comparison of the Proportion of Students at each Mathematical Proficiency Level between Hong Kong and OECD Average in PISA 2006

	Hong Kong	OECD Average	Difference (HK - OECD)
Level 6	9.0%	3.3%	5.7% **
Level 5	18.7%	10.0%	8.7% **
Level 4	25.6%	19.1%	6.5% **
Level 3	22.7%	24.3%	-1.6%
Level 2	14.4%	21.9%	-7.5% **
Level 1	6.6%	13.6%	-7.0% **
Below Level 1	2.9%	7.7%	-4.8% **

** Significant at the 0.01 level.

Math Proficiency Levels
of Hong Kong – 2003 vs 2006

Proportion of Hong Kong Students at each Mathematical Proficiency Level in PISA 2006 and PISA 2003

	PISA 2006	PISA 2003	Difference 2006-2003
Level 6	9.0%	10.5%	-1.5%
Level 5	18.7%	20.2%	-1.4%
Level 4	25.6%	25.0%	0.6%
Level 3	22.7%	20.0%	2.8%
Level 2	14.4%	13.9%	0.5%
Level 1	6.6%	6.5%	0.1%
Below Level 1	2.9%	3.9%	-1.0%

*NO significant differences at all levels between 2006 vs 2003 in Math

Quality and Equality in Reading (2000+) and Mathematics (2003)

Quality and Equality of Hong Kong Secondary School System (PISA2000+)
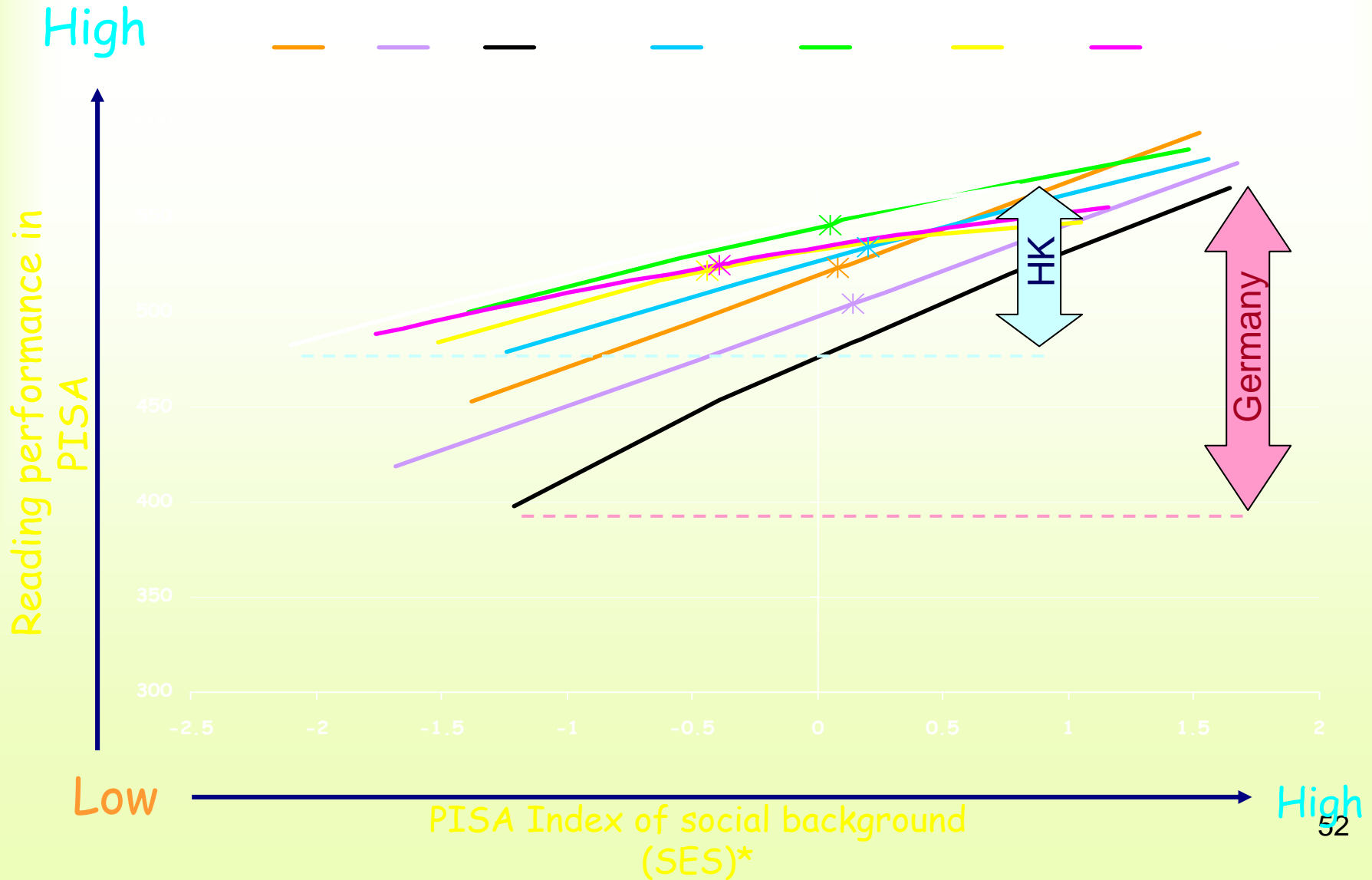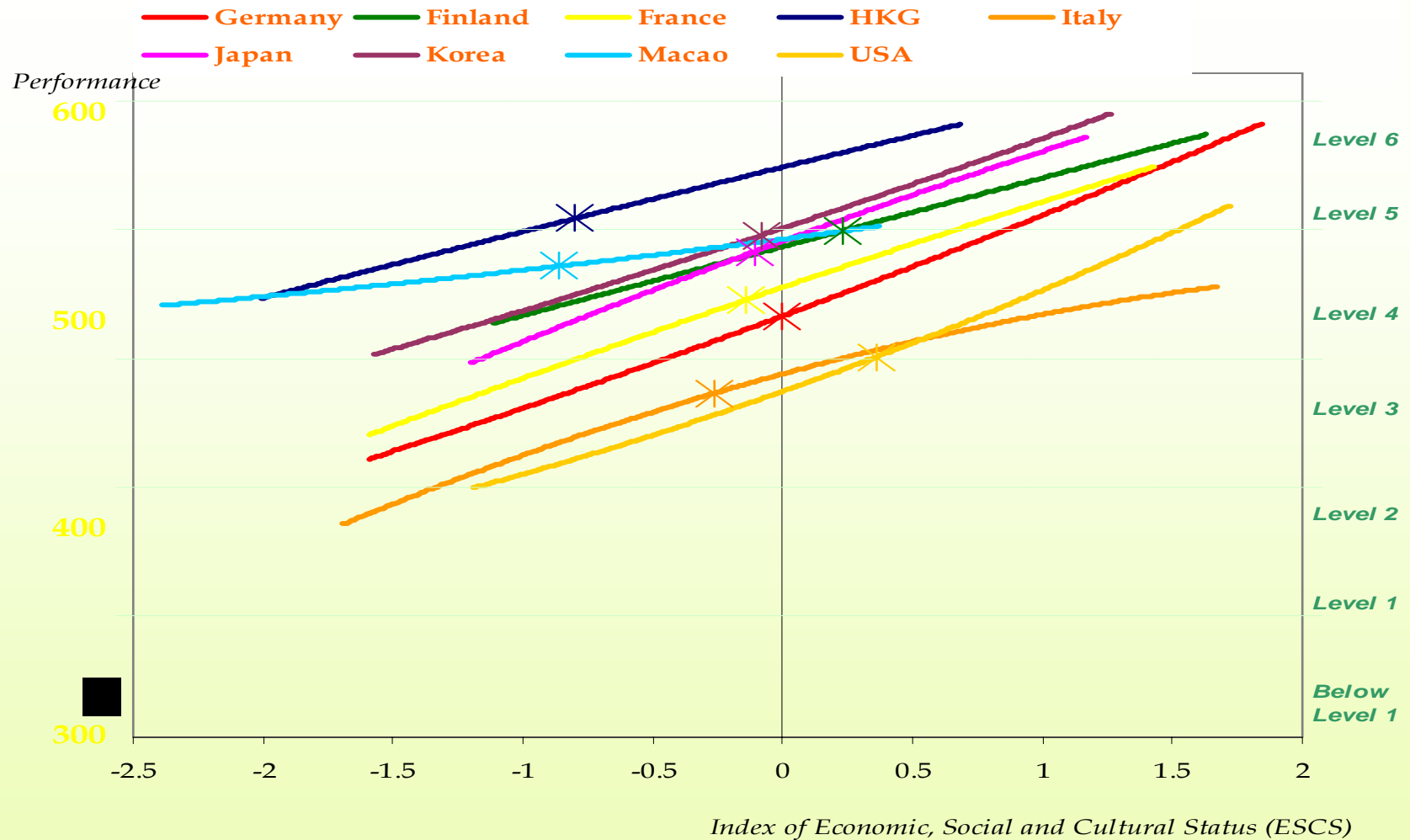
High

Reading performance in PISA

HK

Germany

500

450

400

350

300

-2.5   -2   -1.5   -1   -0.5   0   0.5   1   1.5   2

Low

High

PISA Index of social background (SES)*

Quality and Equality of Hong Kong Secondary School System (PISA 2003)

High science performance

560

— Finland

High average performance

High average performance

Large socio-economic disparities

High social equity

Hong Kong-China—

540

Chinese Taipei —
— New Zealand

Estonai —
— Australia

— Canada
— Japan

— Netherlands

Liechtenstein —

— Slovenia

520

— Korea

Germany —
Czech Republic —

United Kingdom —
Switzerland

Macao-China

Belgium —

Austria
Ireland —

Strong socio-
economic impact on
student performance

— Hungary

Sweden —

Socially equitable
distribution of learning
opportunities

500

— Poland
— Denmark

— France

— Croatia
Latvia —

Iceland—

United States
Slovak Republic—

— Lithuania

— Spain

— Norway

Luxembourg —

480

Russian Federation—

— Italy

Portugal—

- - Greece

460

—Israel

Low average performance

Low average performance

Large socio-economic disparities

High social equity

440

22

12

2

Low science performance
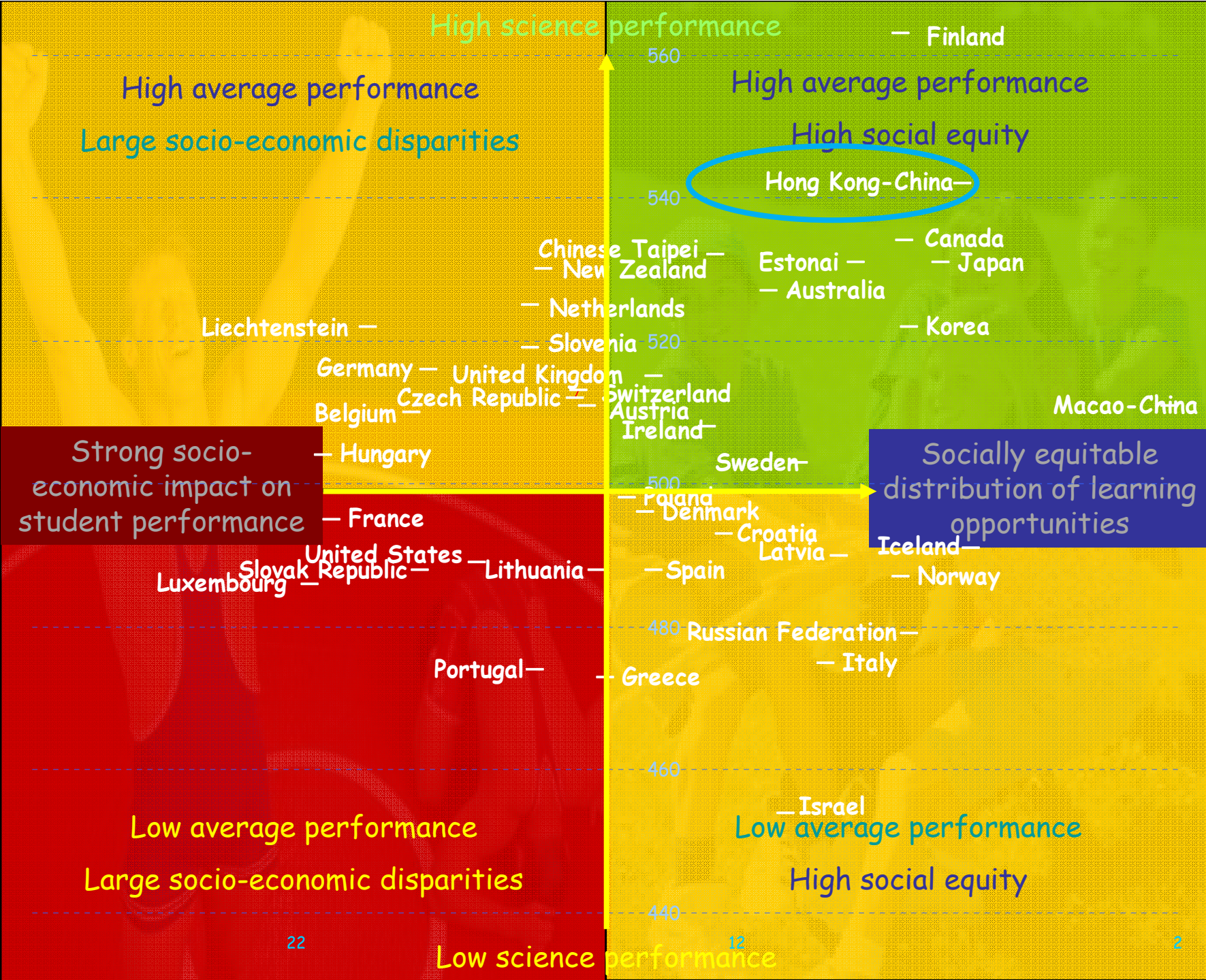
Disparity of High and Low Achievers in Science, Reading and Mathematics

Disparity of High and Low Achievers in Science

	All students		5thPercentile		95thPercentile		Difference
	Mean	S.E.	Score	S.E.	Score	S.E.	(95th-5th)
Israel	454	(3.7)	275	(5.7)	636	(5.5)	361
New Zealand	530	(2.7)	347	(5.2)	699	(3.1)	352
United Kingdom	515	(2.3)	337	(5.4)	685	(3.5)	348
United States	489	(4.2)	318	(4.5)	662	(4.8)	344
Japan	531	(3.4)	356	(6.1)	685	(3.6)	328
OECD average	500	(0.5)	340	(1.0)	652	(0.8)	311
Canada	534	(2.0)	372	(4.7)	681	(2.8)	309
Sweden	503	(2.4)	347	(3.8)	654	(3.4)	308
Chinese Taipei	532	(3.6)	369	(4.5)	676	(3.4)	307
Hong Kong-China	542	(2.5)	380	(6.2)	682	(3.1)	301
Korea	522	(3.4)	367	(8.4)	662	(5.9)	296
Macao-China	511	(1.1)	378	(3.6)	635	(2.6)	257
Azerbaijan	382	(2.8)	300	(3.1)	485	(7.3)	185

Disparity of High and Low Achievers in Mathematics

	Mean score		5th Percentile		95th Percentile		Difference
	Mean	S.E.	Score	S.E.	Score	S.E.	(95th-5th)
Israel	442	(4.3)	266	(11.2)	615	(4.7)	350
Hong Kong	547	(2.7)	386	(6.1)	692	(4.8)	306
New Zealand	522	(2.4)	368	(3.6)	674	(3.6)	306
Korea	547	(3.8)	392	(7.1)	694	(8.2)	302
OECD average	498	(0.5)	346	(1.1)	645	(0.9)	300
Japan	523	(3.3)	370	(6.4)	668	(4.2)	298
United States	474	(4.0)	328	(7.6)	625	(4.8)	297
United Kingdom	495	(2.1)	351	(5.0)	643	(3.8)	292
Canada	527	(2.0)	383	(4.0)	664	(3.3)	281
Macao-China	525	(1.3)	384	(3.6)	660	(3.3)	276
Finland	548	(2.3)	411	(5.0)	678	(3.0)	266
Azerbaijan	476	(2.3)	403	(2.4)	556	(5.2)	153

58

Disparity of High and Low Achievers in Reading

	All Students		5th Percentiles		95th Percentiles		Difference
	Mean	S.E.	Score	S.E.	Score	S.E.	(95th-5th)
Argentina	374	(7.2)	155	(14.8)	560	(5.9)	406
Uruguay	413	(3.4)	204	(7.8)	604	(5.7)	400
Israel	439	(4.6)	237	(10.1)	626	(5.0)	389
Japan	498	(3.6)	317	(6.8)	654	(3.8)	337
United Kingdom	495	(2.3)	318	(5.2)	653	(3.6)	335
OECD average	492	(0.6)	317	(1.4)	642	(0.8)	324
Canada	527	(2.4)	357	(4.8)	674	(3.9)	316
Korea	556	(3.8)	399	(9.7)	688	(5.0)	289
Chinese Taipei	496	(3.4)	346	(5.8)	624	(4.0)	278
Hong Kong-China	536	(2.4)	390	(6.2)	660	(2.7)	270
Finland	547	(2.1)	410	(4.8)	675	(2.8)	265
Macao-China	492	(1.1)	359	(4.3)	610	(2.4)	250
Azerbaijan	353	(3.1)	243	(4.4)	472	(6.0)	229

HLM analysis for
Between school Variance

HLM-Null model

- **The outcome variables are: PV1SCIE, PV2SCIE, PV3SCIE, PV4SCIE, PV5SCIE**

- **Final estimation of fixed effects**
- **(with robust standard errors)**
- **--**

Fixed Effect	Coefficient	Standard Error	T-ratio	Approx. d.f.	P-value
For INTRCPT1, B0					
INTRCPT2, G00	540.591344	4.717349	114.596	132	0.000

- **Final estimation of variance components:**

Random Effect	Standard Deviation	Variance Component	df	Chi-square	P-value
INTRCPT1, U0	**51.85763**	**2689.21336**	**132**	**2060.26438**	**0.000**
level-1, R	**75.94195**	**5767.17988**			

61

HLM-Control for AAI and mean AAI

- The outcome variables are: PV1SCIE, PV2SCIE, PV3SCIE, PV4SCIE, PV5SCIE

- Final estimation of fixed effects
- (with robust standard errors)
- --

Fixed Effect	Coefficient	Standard Error	T-ratio	Approx. d.f.	P-value
For INTRCPT1, B0					
INTRCPT2, G00	544.833759	1.865119	292.117	131	0.000
AAI_MEAN, G01	0.736150	0.297319	2.476	131	0.015
For AAI slope, B1					
INTRCPT2, G10	3.581657	0.231437	15.476	1816	0.000

- --
- Final estimation of variance components:
- --

Random Effect	Standard Deviation	Variance Component	df	Chi-square	P-value
INTRCPT1, U0	16.59981	**275.55373**	131	379.03159	0.000
level-1, R	68.73785	4724.89238			

- --

- **Between school variance reduced from 2689 to 275**
- **% of between school variance explained by AASI and mean AAI is**
- **(2689-275)/2689 = 89.8%**

Education Expenditure and Performance

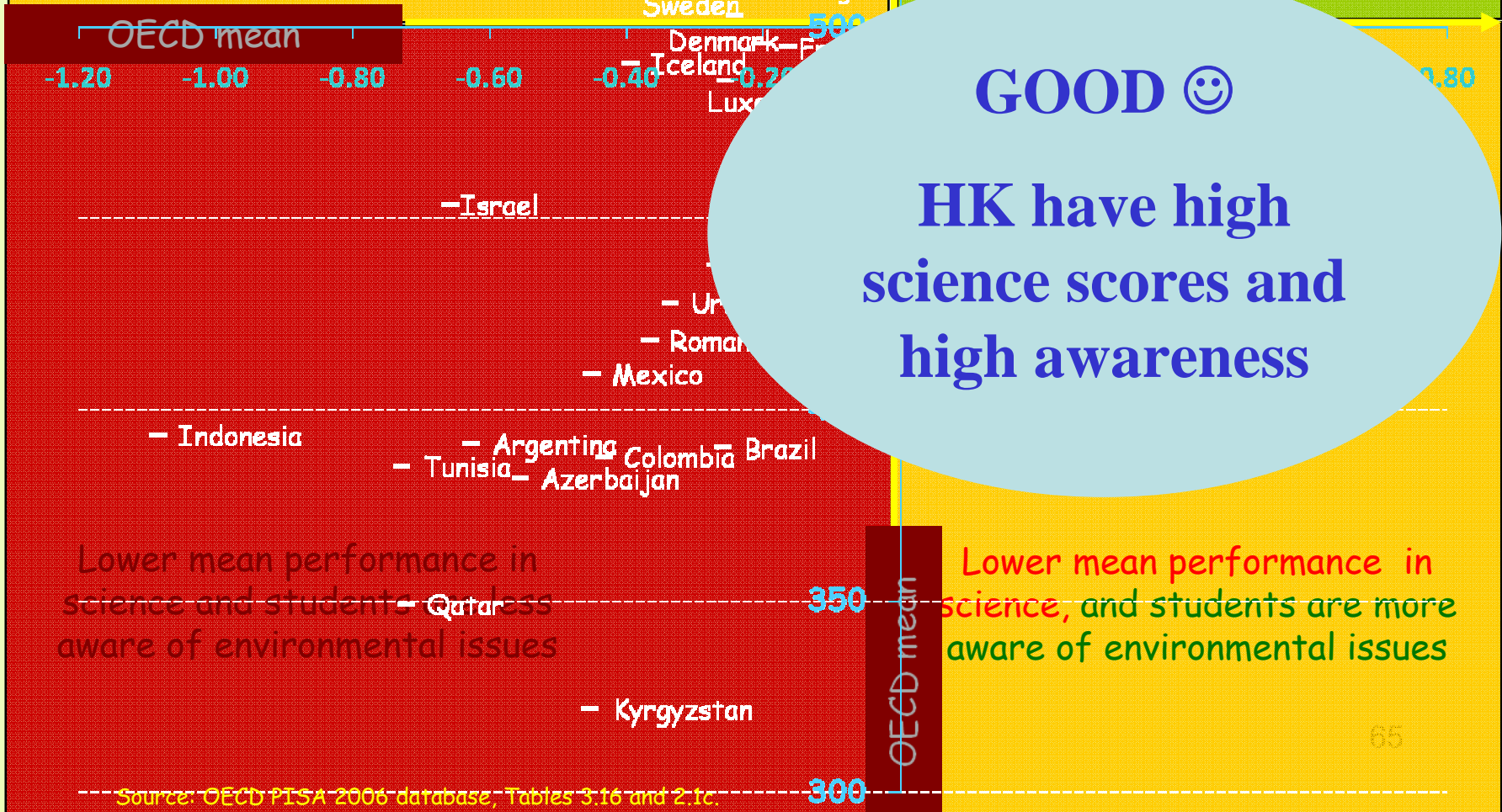|	Science scores	GDP per capita (US $, PPP) EAG2004	as a % of GDP	Cumulative expenditure per student between 6 and 15 years (US$, PPP)
Australia	527	30875	4.8	63675
Austria	511	33235	5.4	86473
Belgium	510	31975	6.0	70818
Canada	534	32413	m	m
Czech Republic	513	19426	4.4	37822
Denmark	496	32335	8.4	78479
Finland	563	29833	6.4	64519
France	495	29006	5.8	66640
Germany	516	29916	4.6	56283
Hong Kong	542	30822	4.7	43105
Greece	473	27691	3.3	48423
Hungary	504	16519	5.4	37295
Iceland	491	33271	7.6	83893
Ireland	508	36536	4.7	57263
Italy	475	27744	4.6	75864
Japan	531	28930	3.6	69165
Korea	522	20723	4.6	52598
Luxembourg	486	w	m	m
Mexico	410	10145	5.4	17535
Netherlands	525	33571	5.2	67302
New Zealand	530	24834	6.5	52475
Norway	487	41880	7.6	88157
Poland	498	13089	5.4	31295
Portugal	474	19324	5.3	53126
Slovak Republic	488	14651	4.2	23392
Spain	488	26018	4.3	56591
Sweden	503	31072	7.4	72743
Switzerland	512	34740	6.0	94377
Turkey	424	7212	4.0	12576
United Kingdom	515	31780	5.3	64007
United States	489	39660	5.3	91770

Science Performance, Environment Awareness, and Career Aspiration in Science

Figure 3.18. Performance in science and awareness of environmental issues

Higher mean performance in science, but students are less aware of environmental issues

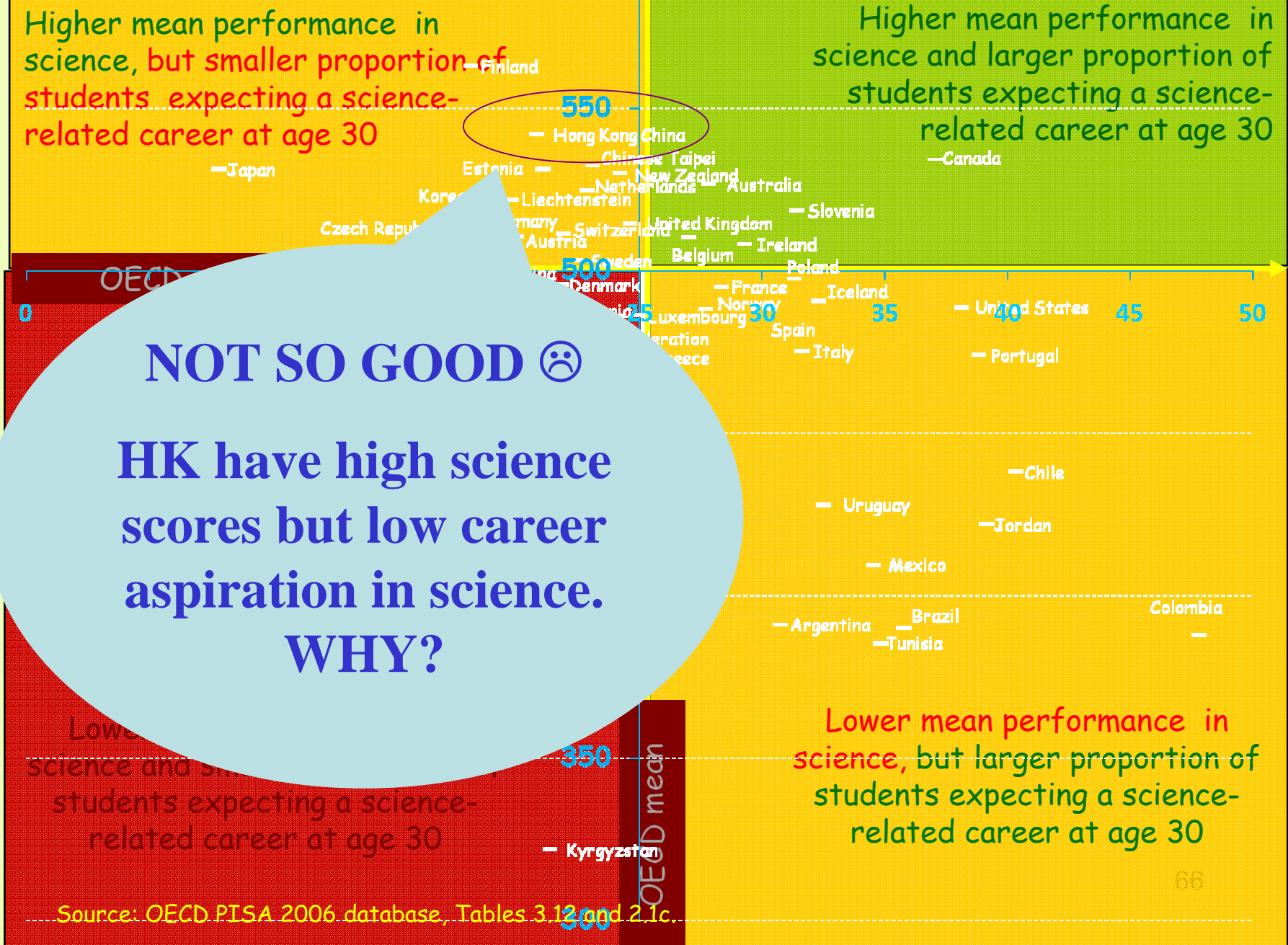Higher mean performance in science and students are more aware of environmental issues

OECD mean

-1.20   -1.00   -0.80   -0.60   -0.40   -0.20   0.80

600

550

500

350

300

Finland

Hong Kong-China

Japan   New Zealand Estonia   Canada
        Netherlands Australia   Chinese Taipei
Korea   Liechtenstein
Switzerland Czech Republic   Kingdom
Belgium
Sweden

Denmark
Iceland
Luxe

Israel

Ur
Roman
Mexico

Indonesia
        Argentina Colombia Brazil
    Tunisia Azerbaijan

Lower mean performance in science and student Qatar less aware of environmental issues

Lower mean performance in science, and students are more aware of environmental issues

Kyrgyzstan

OECD mean

GOOD ☺

HK have high science scores and high awareness

65

Source: OECD PISA 2006 database, Tables 3.16 and 2.1c.

Figure 3.15. Performance in science and proportions of students expecting a science-related career at age 30

Top performers matter: Excellence in education and countries' research intensity