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Ten-year Trend in SES Effects on Reading Achievement at School and Individual Levels: A Cross-Country Comparison .

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presented at *the International Conference of Improving Education 2009*,
Stockholm, Sweden



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Background (I)

In the past decades, a trend towards decentralization and deregulation of schooling was observed internationally (e.g., Beare & Boyd, 1993; Hanson, 1997; Whitty, Power, & Halpin, 1998).

- Implementation of decentralized school finance;
- Increased local autonomy, even down to school and teacher levels;
- Introduction of voucher system & free school choice;
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Evaluation studies indicated that the recent school reforms and policy changes have great impact on achievement differences among students and schools, and strengthened the educational inequality (e.g., Gewirtz et al., 1996; Levin, 1998; McEwan, 2000).





Background (II)

Even though there is a such global trend, countries differ however, in the degree of decentralization and deregulation. They have rather different approach to implement such reforms.

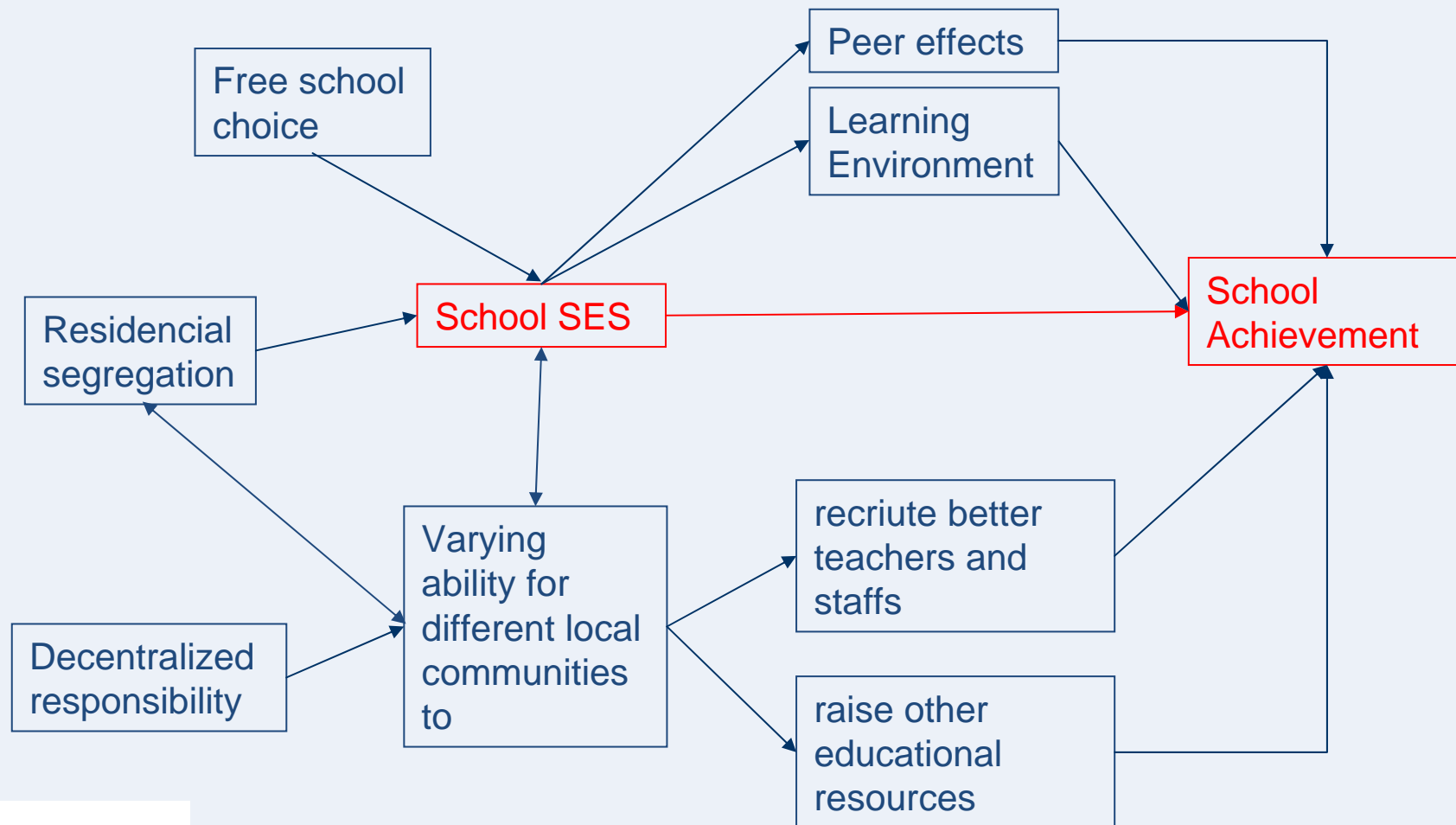
Also, the country's particular social, economic and cultural circumstances will reinforce or constraint the effects of school reforms.

Thus, we may expect cross-country differences in the consequences of the educational reforms, for example, in educational equality.





A Conceptual Model





Aims of the study

Against these background, the current study is to examine cross-country differences of the changes in Educational inequality during the decade between 1991 and 2001 in a multiple group comparison.

The trend study in IEA PIRLS 2001 makes the cross-country over-time comparison possible. Nine countries participated.

Two aspects of educational inequality are focused, namely:

- Effect of Socioeconomic status on reading achievement at student and school levels;
- Variations in reading achievement at student and school levels.





Process of analysis

- Step1: to estimate factor score of SES;
- Step2: to examine the changes in variance components of reading achievement at student- and school- levels;
- Step3: to examine the changes in SES effect on reading achievement at student- and school- levels.





Data used in this study is from the Ten-Year Trend Study in IEA PIRLS 2001 and the IEA Reading Literacy Study 1991 (RLS 2001 and RLS 1991).

Country	RLS 1991			RLS 2001		
	Grade	Students	Schools	Grade	Students	Schools
Greece	4	3516	175	4	1109	68
Hungary	3	3009	144	3	4707	216
Iceland	3	3961	179	4	1797	65
Italy	4	2221	154	4	1590	92
New Zealand	5	3016	176	4	1188	73
Singapore	3	7326	206	3	3601	98
Slovenia	3	3297	140	3	1502	75
Sweden	3	4301	123	3	5361	148
USA	4	6433	164	4	1826	85





Indicators

10-year trend study in PIRLS 2001 was conducted to obtain information about changes in Reading achievement and possible explanations to the changes:

- To measure the dimensionality of reading achievement:
 - the 14 reading passage scores;
- Measures of socioeconomic status were from Student Questionnaire :
 - HOMEPI: derived from 10 home possession items;
 - STUDP: derived from 8 students' own possessions;
 - Books: number of books at home;
 - News: newspaper at home.
 - Country specific variable: e.g., Piano, Encyclopedia, etc.





Analytical Methods

- Factor score approach;
- Two-level two-group structural equation models with weight;
- Missing data analysis;
- Chi-square difference test.





Step1: Estimating SES factor score (1)

One factor model was fitted to each Trend country.

Country	χ^2	Df	RMSEA
Greece	14.27	2	.037
Hungary	4.44	2	.013
Iceland	53.71	2	.067
Italy	17.70	2	.045
New Zealand	5.22	2	.020
Singapore	12.61	5	.012
Slovenia	34.42	2	.058
Sweden	228.13	9	.051
USA	79.94	2	.069





Estimating SES factor score (2)

Standardized factor loadings in the one-factor measurement model of SES in the 9 trend countries

Indicators	Standardized Factor Loading								
	GRC	HUN	ICE	ITA	NZL	SGP	SVN	SWE	USA
HOMEPI	.75	.72	.57	.69	.67	.68	.69	.42	.57
STUDPI	.69	.57	.52	.50	.52	.47	.57	.42	.96
BOOKS	.44	.40	.15	.31	.40	.44	.33	.44	.34
NEWSP	.20	-.12	.16	.23	.16	.25	.26	.29	.12
PIANO						.49		.36	
ENCYC								.39	

GRC = Greece, HUN = Hungary, ICE = Iceland, ITA = Italy, NZL = New Zealand, SGP = Singapore, SVN = Slovenia, SWE = Sweden, USA = the United States.



Estimating SES factor score (3)

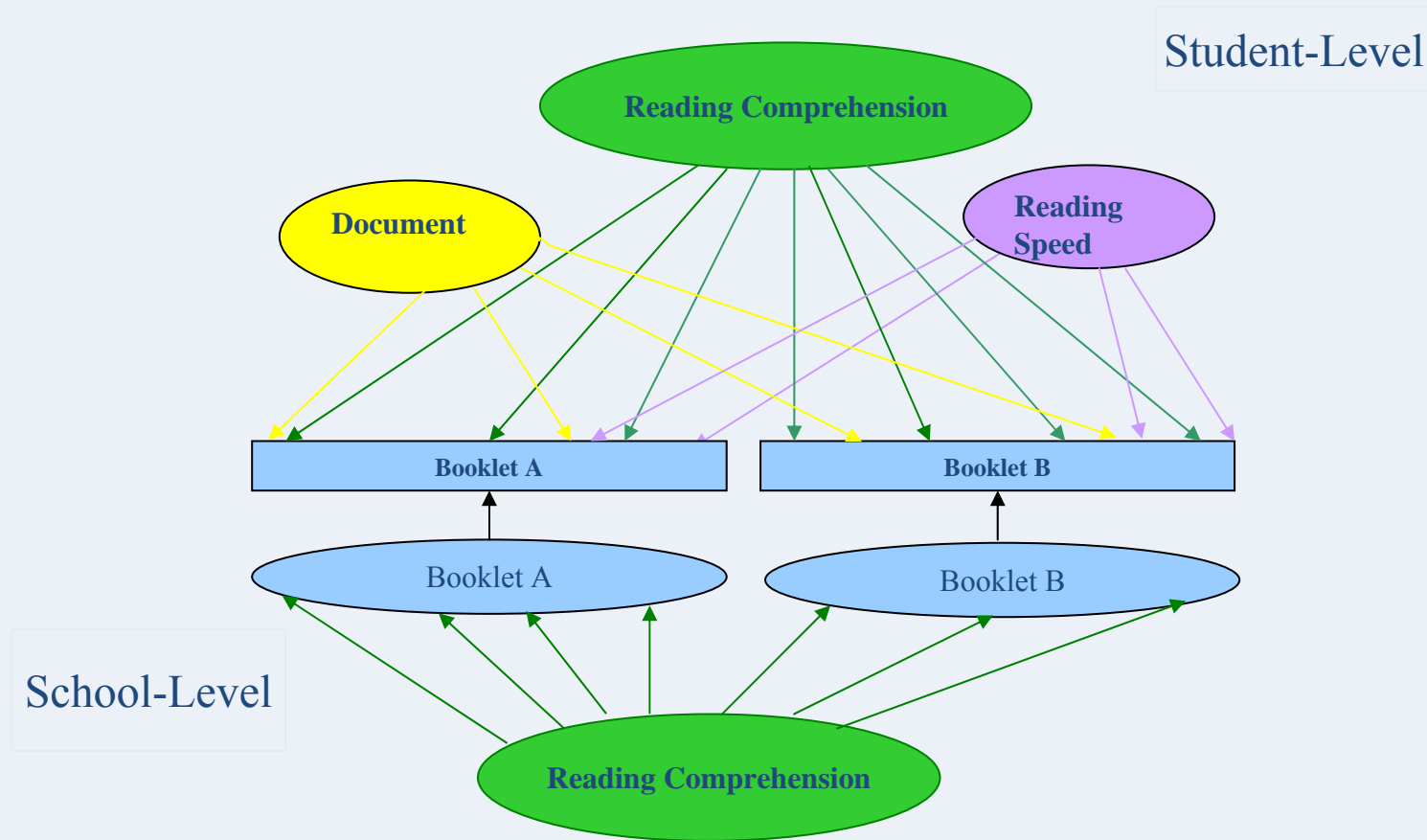
Average factor score determinacy for the general SES factor in comparison with Cronbach Alpha

Country	Average factor score determinacy	Cronbach Alpha
Greece	.69	.57
Hungary	.70	.46
Iceland	.54	.35
Italy	.59	.44
New Zealand	.60	.48
Singapore	.67	.53
Slovenia	.68	.50
Sweden	.64	.43
USA	.71	.58



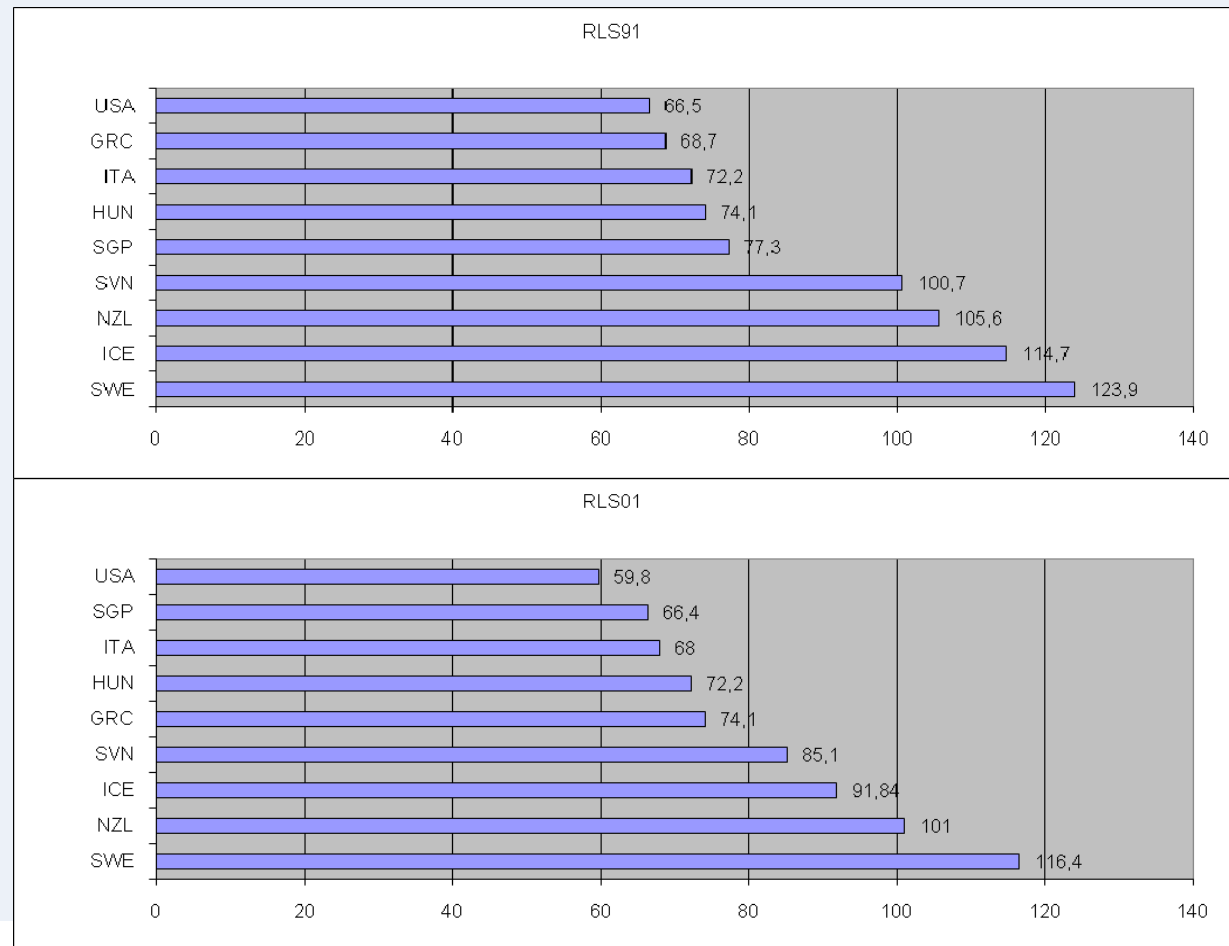


Step2: Measurement Structure of reading achievement



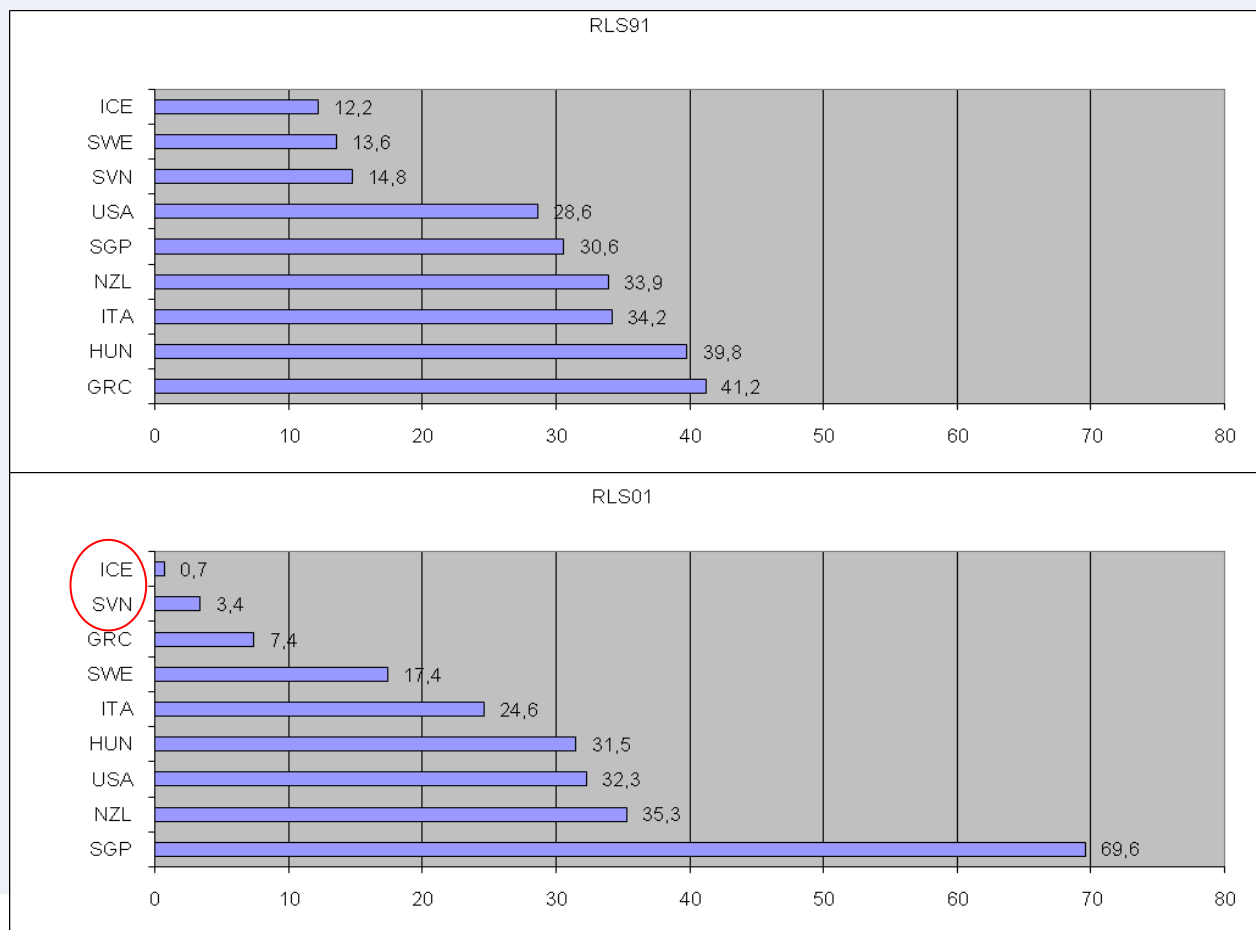


Cross-country differences in variation of reading achievement among students



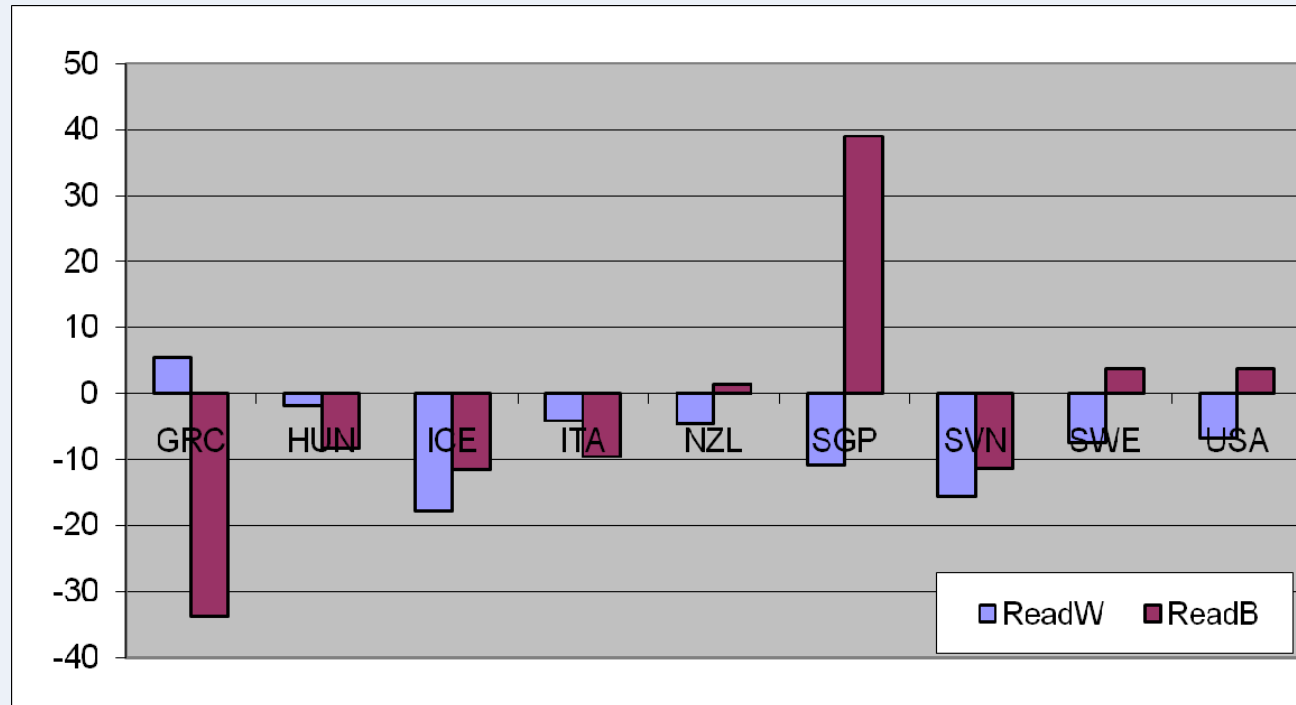


Cross-country differences in variation of reading achievement between schools





Changes in reading achievement differences at student and school levels in each trend country between RLS91 and RLS01





Chi-Square Difference test for RLS 2001 and RLS 1991 Populations of the Relationship between SES and Reading Achievement factor at School Level

Country	χ^2_{diff}	Df _{diff}
Greece	3.02	1
Hungary	1.29	1
Italy	5.83	1
New Zealand	1.94	1
Singapore	33.08	1
Sweden	.47	1
USA	16.13	1





Effects of Socio-economic Status on Reading Dimensions at Individual and School levels in RLS 1991 and 2001 Trend Countries.

Country	2SES → ReadB RLS2001	2SES → ReadB RLS1991
Greece	.25	.74
Hungary	.86	.87
Italy	.53	.18
New Zealand	.84	.77
Singapore	.89	.66
Sweden	.63	.67
USA	.93	.84

Note: beta coefficients in *Italic* are statistically non-significant.





Conclusion (1)

Factor score approach have several advantages:

- Obtain consistency and comparability of factor;
- Efficiently use available data;
- Increase measurement quality and reliability;
- Reduce model complexity in the later step of analysis.





Conclusion (2)

Two-level two-group model of reading achievement showed:

- Significant differences in measurement properties of reading achievement between RLS 1991 and RLS 2001 in all trend countries except for New Zealand;
- The hypothesis of increasing between school reading variation got support from Greece, USA, and Sweden;
- A special case was found: Singapore





Conclusion (3)

- The relationship between school SES and reading achievement showed:
 - Results from USA, Greece, Italy, and Singapore support the hypothesis;
 - Why the current hypotheses were only partly supported?
- Lack of statistic power;
- Inefficient SES indicators.





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Thank you for your attention!

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Yang Hansen, K. (2008). Ten-year trend in SES effects on reading achievement at school and individual levels: a cross-country comparison. *Educational Research and Evaluation*, 14(6), 521–537.



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