UNIVERSITY OF GOTHENBURG

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School Characteristics and Equity

Evidence from 50 countries in TIMSS 2011

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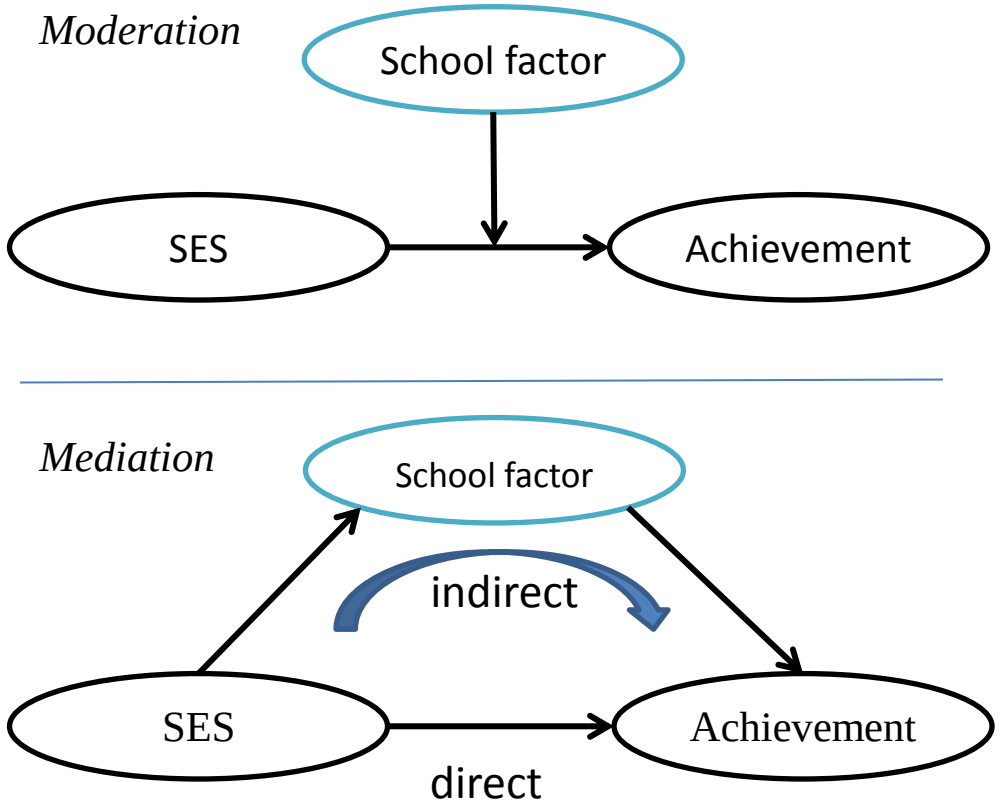
How to promote equity

- Equity a priority in educational policy
- Yet the strong relation SES → achievement persists, as does high dispersion of student achievement
- Important to identify ***school factors*** that may reduce the strength of SES

Previous research:
Controlling for selection bias vs. mechanism behind SES → achievement

- Mostly to control for selection bias
- Mechanisms: mostly mediation studies
  (e.g. Schmidt et al. 2015; Rjosk et al., 2015)



Previous research

New wave of studies investigating school factors and SES using data from international large-scale studies of educational achievement (e.g. Liu, et al., 2015; Willms, 2010; Schmidt et al., 2015; Burger, 2016)

Findings:

- quantity and quality of instruction
- opportunity to learn
- school climate
- school SES

Research questions

For all countries that participated with Grade 8 in TIMSS 2011:

1. To what extent can differences in within-school SES-achievement slopes be accounted for by school characteristics (reflecting quality and quantity of instruction, school climate, and school SES)?
2. How do country-level differences in equity relate to level and dispersion of mathematics achievement?

Sample

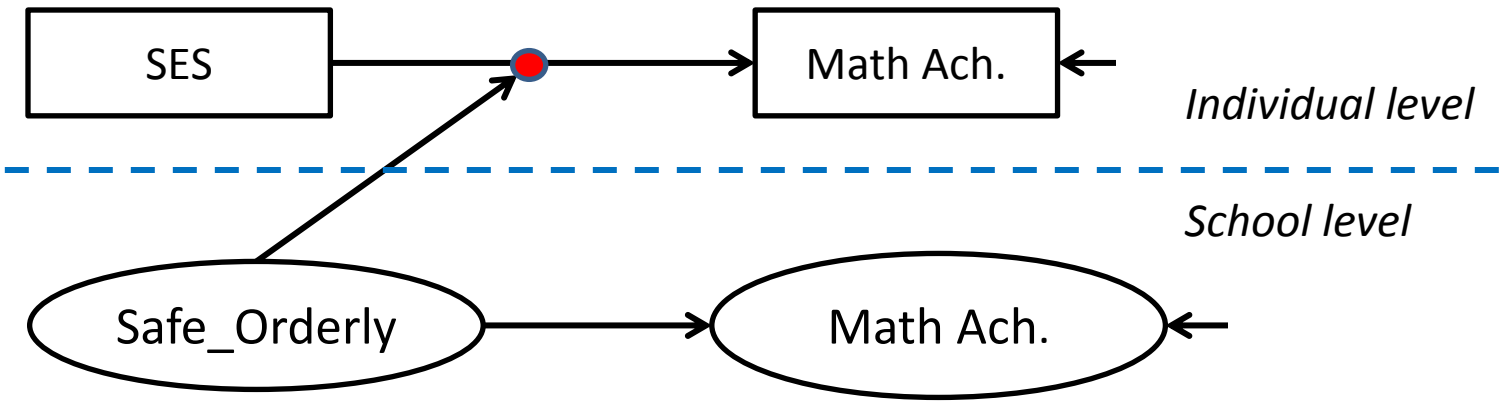
Sample:

- Grade 8
- All countries that participated in TIMSS 2011 (N=50 countries, N= 9203 schools, N= 287 382 students)

Constructs

- Home Educational Resources Scale (SES)
- Yearly hours of instruction (Hours)
- Student assessment of instructional quality (InQua)
- School emphasis on academic success (SEAS)
- Safe and orderly school (Order)
- School SES

Method of analysis

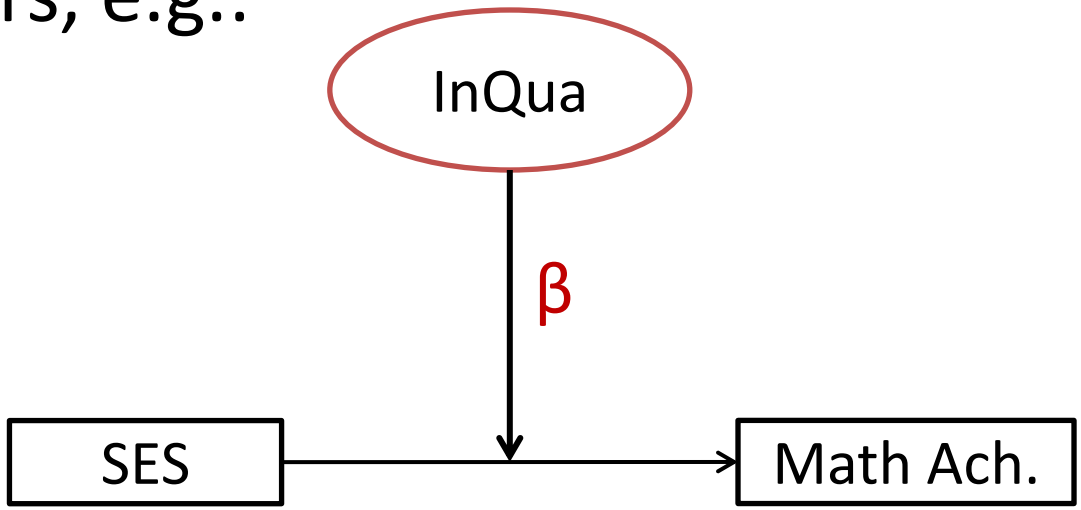


Step.1: Two level multi-group, random slopes SEM models

Step.2: The regression coefficients are then correlated with another and with mean and dispersion of achievement (making it a 3-level analysis)

Compensatory countries

- What are we looking for?
- Negative regression coefficients on school factors, e.g.:



The first step: multi-group

	Mathematics Achievement			**HDI**	**Moderators**					**Math ON School SES**
COUNTRY	Math mean	Math SD	ICC	HDI	InQua	Hours	SEAS	Order	School SES	School-SES
Armenia	467	89	0.2	0.73	2.3*	0.2	-0.7	-0.8	**-2.1***	1.3*
Australia	504	84	0.5	0.93	-0.9	-1.4	**-2.3***	**-2.1***	-1.8	2.3*
etc...										

Compensatory countries

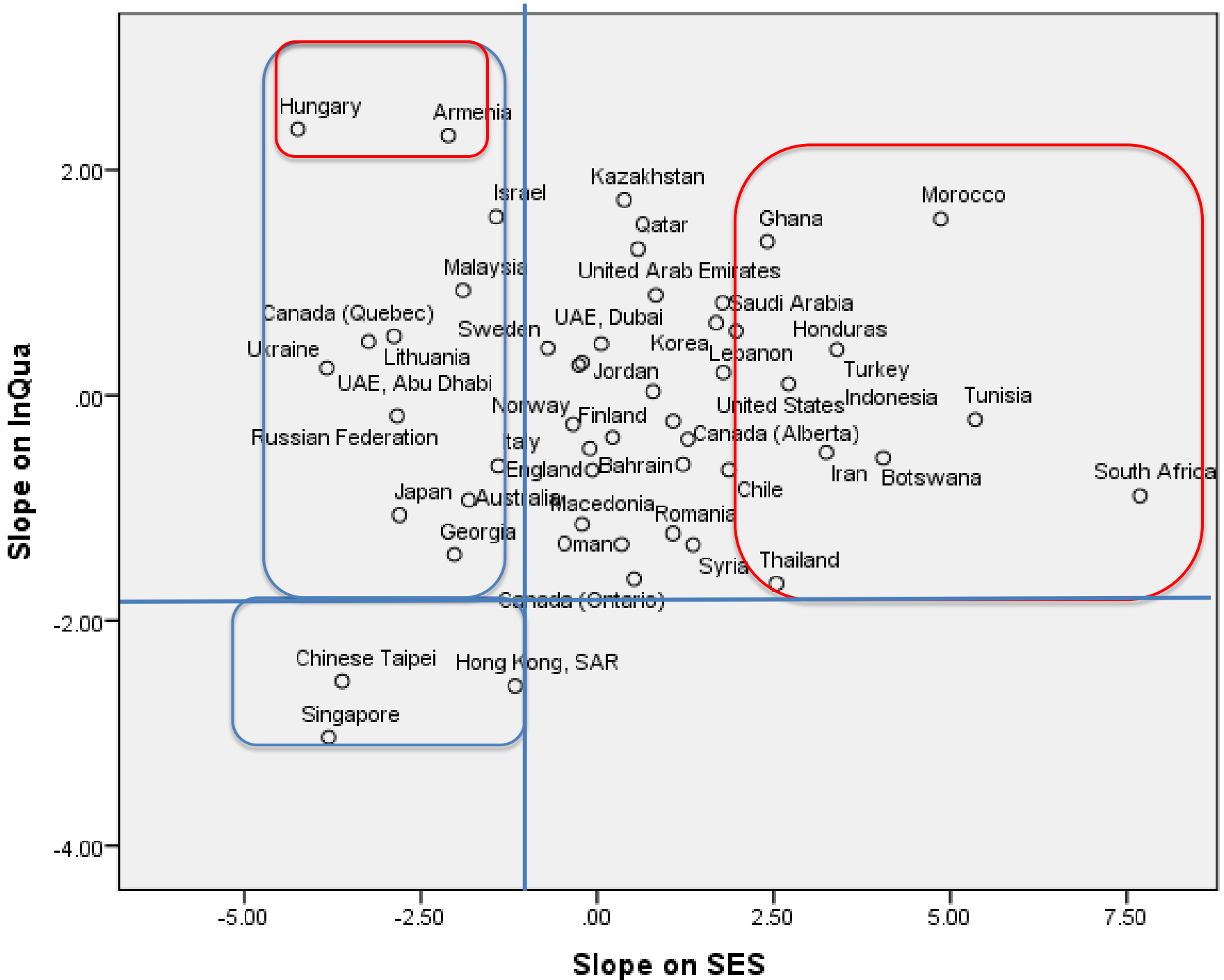
Instruction		**School climate**		**School composition**
InQua	Hours	SEAS	Order	school SES
Canada (O)	Canada (A)	Canada(Q)	Canada(Q)	Canada (Q)
Chinese Tai	Chinese Tai	Chinese Tai	Singapore	Chinese Tai
Singapore	Georgia	Australia	Australia	Singapore
Thailand	Thailand	Lithuania	Russia	Lithuania
Hong Kong	New Zealand	Finland	Norway	Russia
	Oman	Slovenia	Sweden	Georgia
				Armenia
				Hungary
				Japan
				Malaysia
				Ukraine

Anti-compensatory countries

Instruction	School climate		School composition
InQua	**SEAS**	**Order**	**School-SES**
Armenia	Israel	Turkey	Botswana
Hungary	South	USA	Ghana
Kazakhstan	Africa		Honduras
			Indonesia
			Iran
			Korea
			Lebanon
			Morocco
			South Africa
			Thailand
			Tunisia
			Turkey

The second step: country-level correlations

		Dispersion		BetReg	Moderators					HDI
	Math mean	Math _SD	ICC	Ach-SES	InQua	Hours	SEAS	Order	School_ SES	HDI
Math mean	1									
Math_SD	-.24	1								
ICC	-.19	.21	1							
Ach-SES	-.07	.14	**.63****	1						
InQua	-.24	-.08	-.12	-.17	1					
Hours	-.15	-.15	.01	-.13	**.37****	1				
SEAS	**-.49****	.16	.09	.19	.19	.21	1			
Order	**-.34***	**.35***	.08	.17	.03	-.06	**.37****	1		
School SES	**-.64****	-.01	.16	-.23	.05	.03	**.57****	**.41****	1	
HDI	**.79****	**-.37***	-.13	.04	-.20	-.25	**-.40****	**-.41****	**-.50****	1


Hungary
Armenia
Kazakhstan
Israel
Morocco
Ghana
Qatar
Malaysia
United Arab Emirates
Saudi Arabia
Canada (Quebec)
UAE, Dubai
Honduras
Sweden
Korea
Ukraine
Lithuania
Lebanon
Jordan
Turkey
UAE, Abu Dhabi
Norway
United States
Indonesia
Tunisia
Finland
Russian Federation
Canada (Alberta)
Italy
England
Bahrain
Iran
Botswana
South Africa
Chile
Japan
Australia
Macedonia
Romania
Georgia
Oman
Syria
Thailand
Canada (Ontario)
Chinese Taipei
Hong Kong, SAR
Singapore
2.00
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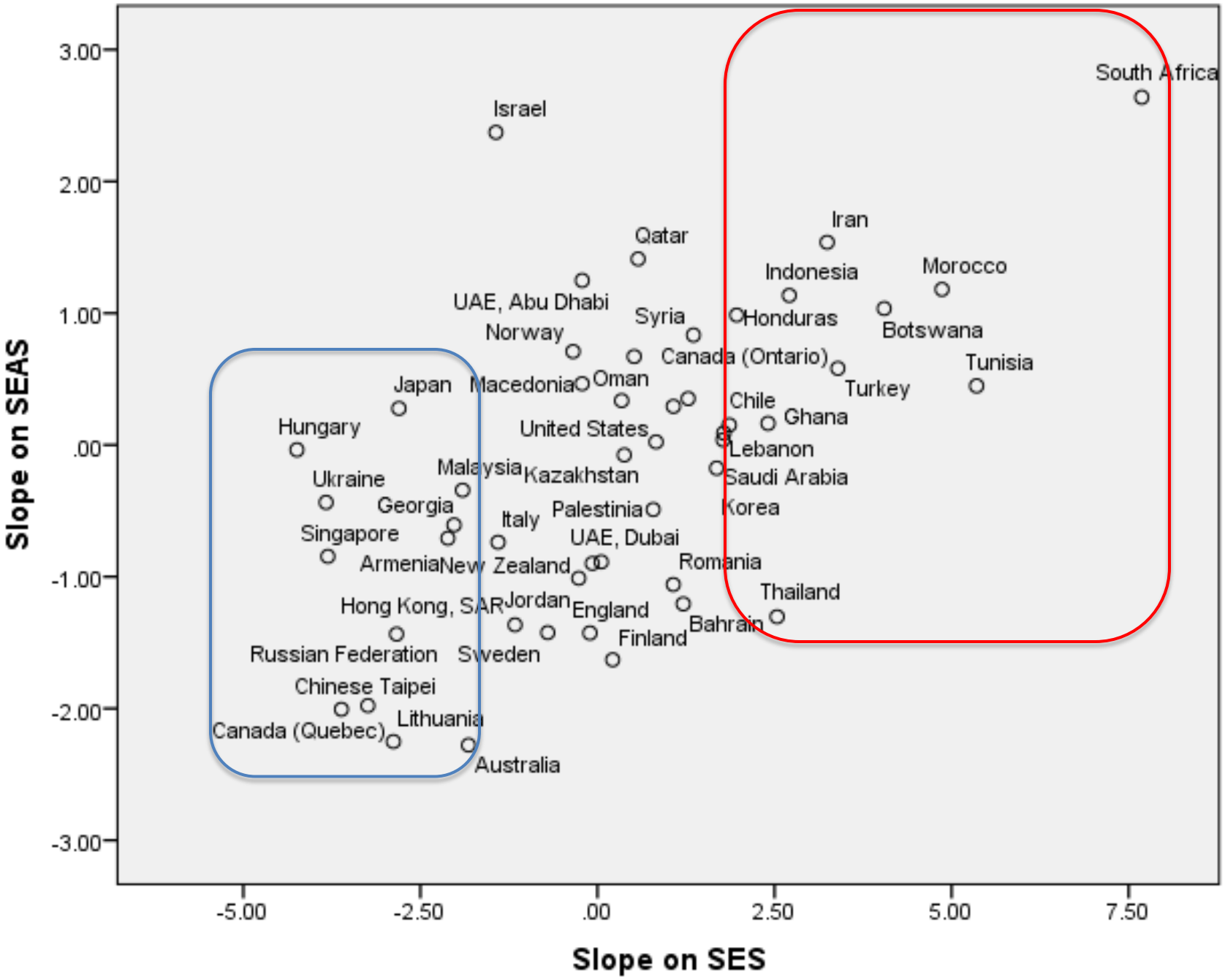
7.50
Slope on lnQua
Slope on SES


Slope on SEAS
Slope on SES
3.00
2.00
1.00
.00
-1.00
-2.00
-3.00
-5.00
-2.50
.00
2.50
5.00
7.50
South Africa
Israel
Iran
Qatar
Indonesia
Morocco
UAE, Abu Dhabi
Syria
Honduras
Botswana
Norway
Canada (Ontario)
Tunisia
Japan
Macedonia
Oman
Turkey
Chile
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United States
Lebanon
Malaysia
Kazakhstan
Saudi Arabia
Ukraine
Georgia
Palestinia
Korea
Italy
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UAE, Dubai
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New Zealand
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Jordan
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Bahrain
Finland
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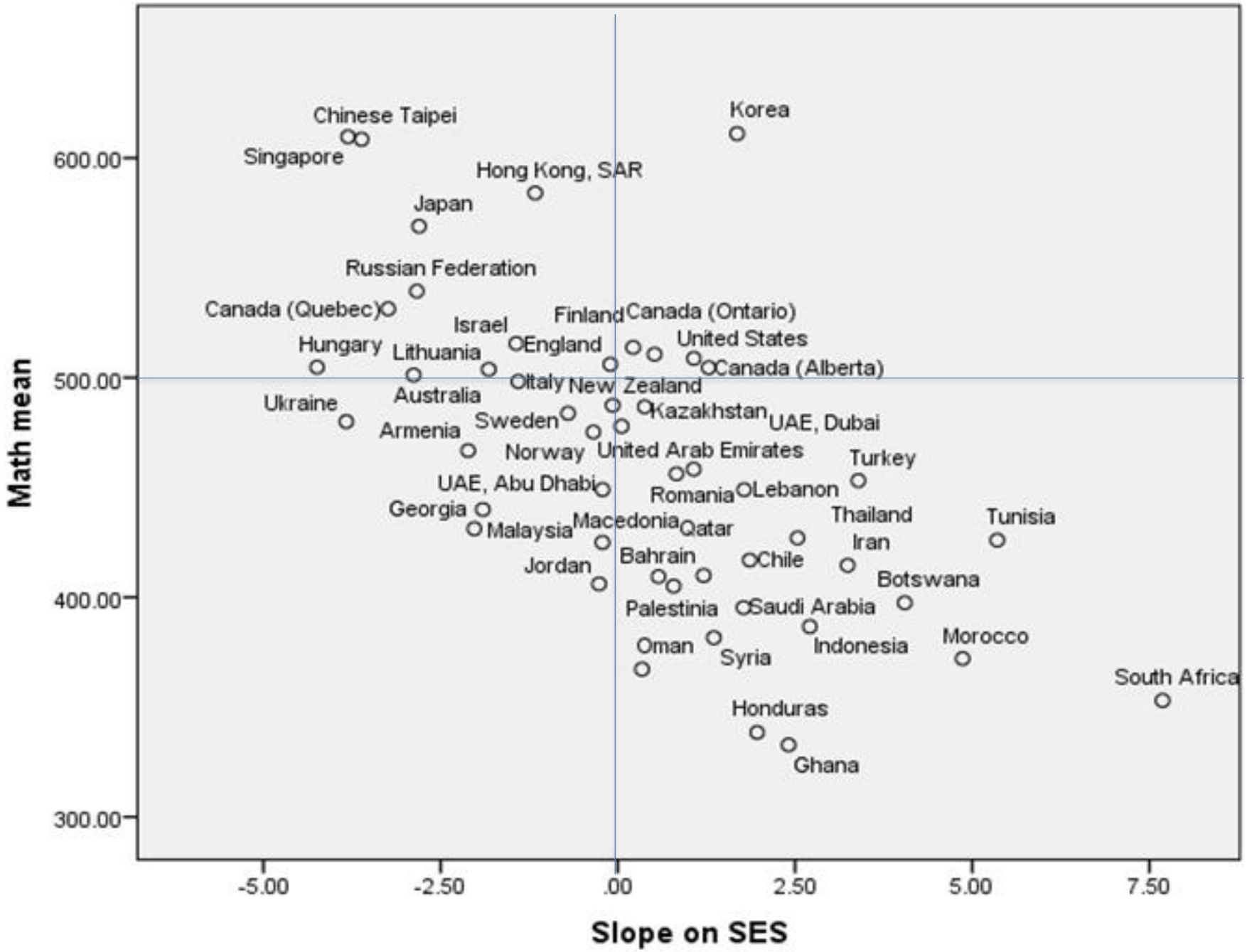
Sweden
Chinese Taipei
Lithuania
Canada (Quebec)
Australia


Chinese Taipei
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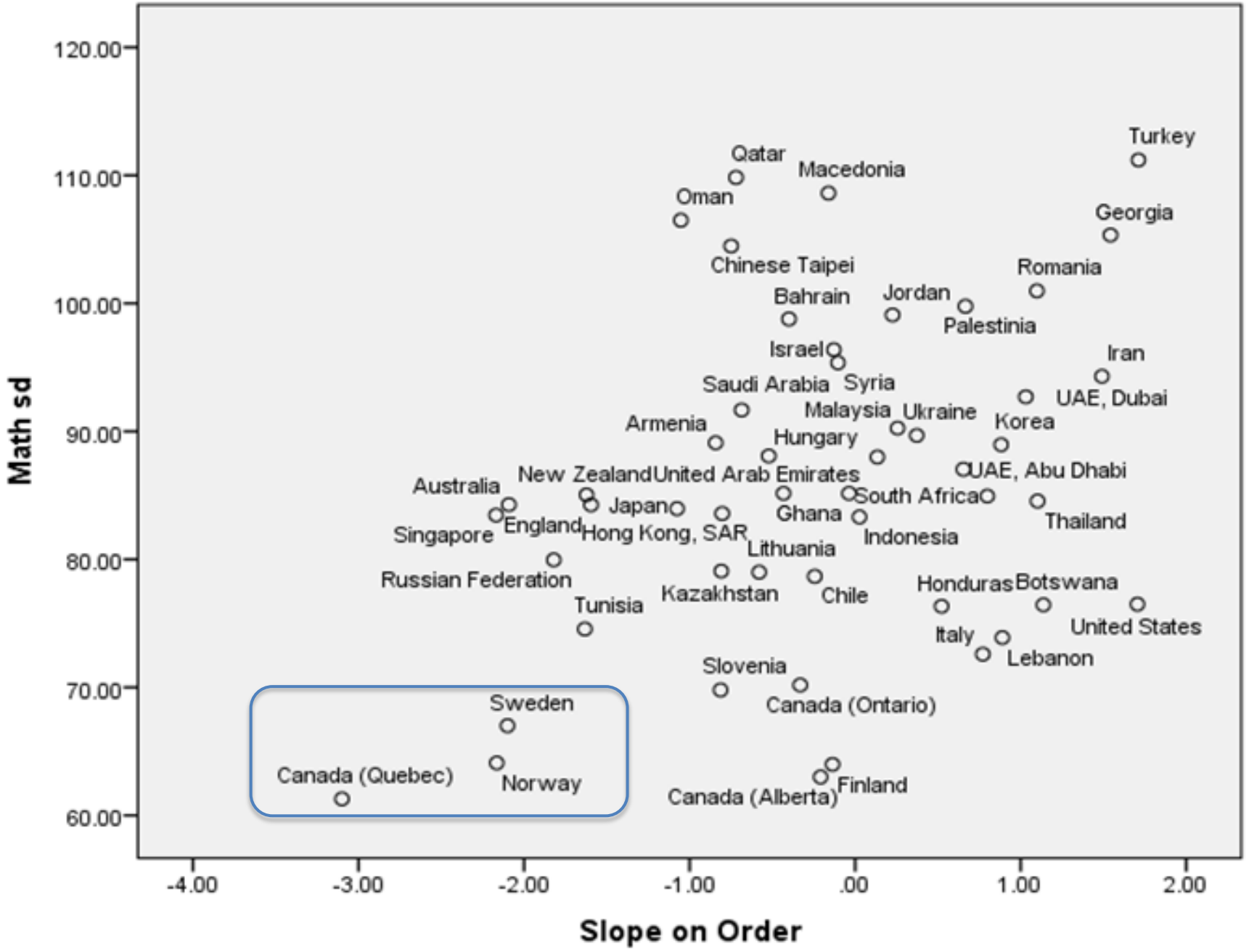
UAE, Abu Dhabi
Romania
Lebanon
Georgia
Thailand
Tunisia
Malaysia
Macedonia
Qatar
Iran
Bahrain
Chile
Jordan
Botswana
Palestinia
Saudi Arabia
Oman
Indonesia
Morocco
Syria
South Africa
Honduras
Ghana
600.00
500.00
400.00
300.00
-5.00
-2.50
.00
2.50
5.00
7.50
Math mean
Slope on SES


Math sd
120.00
110.00
100.00
90.00
80.00
70.00
60.00
-4.00
-3.00
-2.00
-1.00
.00
1.00
2.00
Slope on Order
Turkey
Qatar
Macedonia
Oman
Georgia
Chinese Taipei
Romania
Bahrain
Jordan
Palestinia
Israel
Iran
Saudi Arabia
Syria
UAE, Dubai
Malaysia
Ukraine
Armenia
Korea
Hungary
UAE, Abu Dhabi
New Zealand
United Arab Emirates
Australia
South Africa
Japan
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Thailand
Singapore
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Russian Federation
Honduras
Botswana
Kazakhstan
Chile
Tunisia
United States
Italy
Lebanon
Slovenia
Sweden
Canada (Ontario)
Canada (Quebec)
Norway
Finland
Canada (Alberta)

Summary of results

- Compensatory countries:
  - post-Soviet countries, Scandinavian countries, Asian countries, English speaking (except for USA)
- Strongest moderators: School-SES and school climate
- The anti-compensatory countries included developing countries
- Countries in which school climate and school SES reduced the effect of SES, also had high math achievement

Discussion and conclusion

- InQua and school climate promote equity; partly supported by previous research.
- But, previous research: single country studies or mediation studies
- School SES promoting equity ←→higher achievement across countries: supported by some studies (e.g., Kyriakides et al., 2016, Burger, 2016)

Discussion and conclusion

Few studies who: 1. study moderation effects, 2. school factors promoting equity, 3. countries from all continents

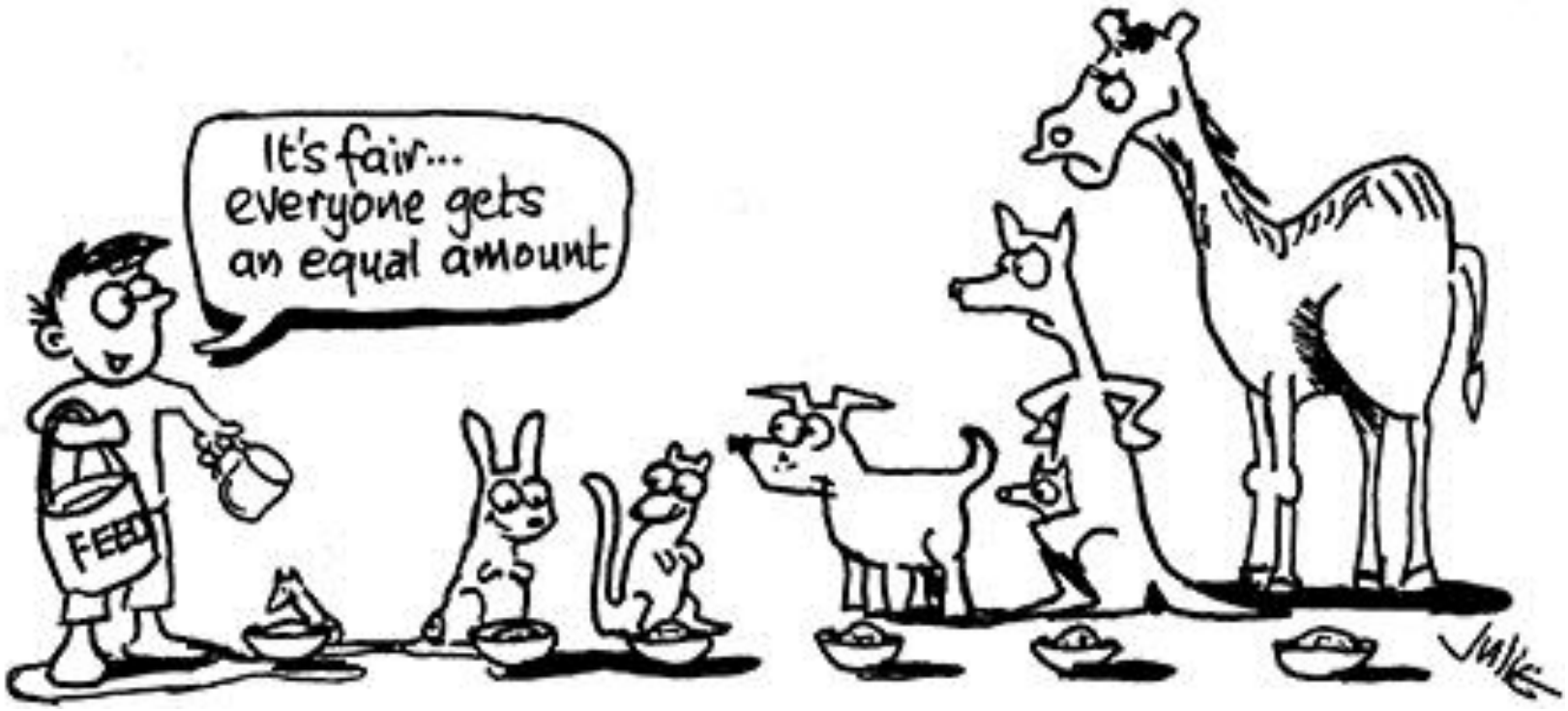
Limitations:

- Cross-sectional study: no causal inferences
- InQua poorly operationalized
- Should have 3-level model, but not possible with random slopes and SEM

Implications for educational policy

School-factors influencing equity may be identified and put in the power of educational policy to improve equity.

Thank you for your attention!



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