


# Subject comparability, forced policy-making and the **social responsibility** of awarding bodies

... the case of 

Iasonas Lamprianou  
Department of Social and Political Sciences  
University of Cyprus

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## ... about myself

- CFAS, University of Manchester
- Cyprus Testing Service
- Dept. Sciences of Education, EUC
- Dept. Social and Political Sciences, UCY

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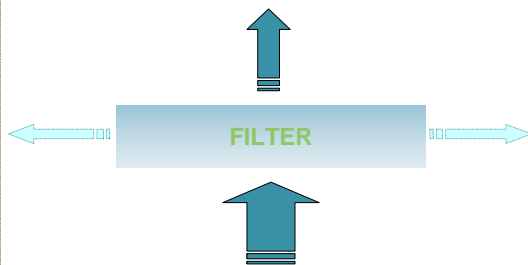
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## Higher Education as a product and a determinant of social class



The role of education in social stratification

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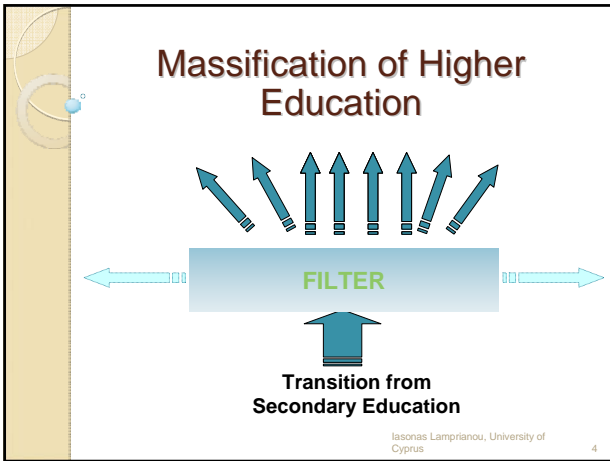
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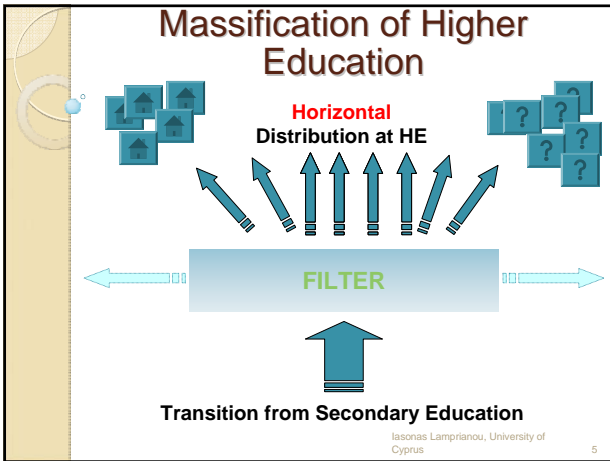
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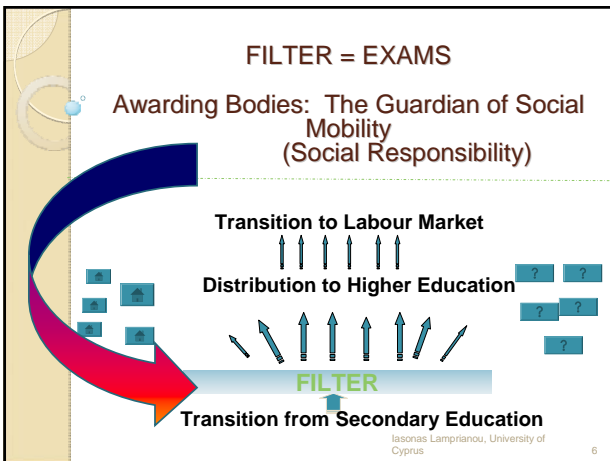
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## Aim of the presentation...

- Use recent empirical data from Cyprus to show how different subject comparability methods may affect the chances of groups of candidates to progress to Higher Education.
- I will compare:
  - **Scaling** method of the Cyprus Testing Service
  - Natural Scores or National Ratings (hence, **NR**) of the Scottish Qualification Authority
  - **Rasch** model
  - Multilevel Models (**MLM**)

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## What is 'comparability' of subjects

- Same grade, same standard? UCAS Tariffs
- Wood, R. (1976). Your *chemistry* equals my *French*, *Times Educational Supplement*, 30 . July 1976
- "Incomprehensible? Inexpressible? Inconceivable? The very idea of inter-subject comparability" (11 Nov. 2010) [7 definitions of comparability]
- "How do HE institutions differentiate between applicants?" (2 June 2010) Dr Robert Wilkins, Coordinator for Admissions to Medicine at Oxford University

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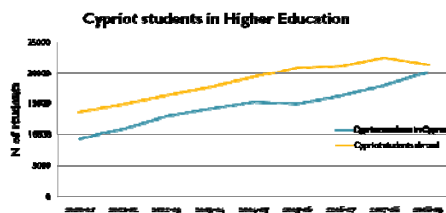
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## The background of the problem

Cypriots tend to study abroad<sup>1</sup> ...



especially in Greece<sup>2</sup> (in 2008/2009: 55%)

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## The Pancyprian examinations

- Cyprus joined the EE in 2004.
- In 2006 Greece changed the University Entrance law for Cypriots (7% of total admissions)
- New system:
  - Each candidate gets a **single** index of ability for any Scientific Field.
  - Students can choose **any combination** out of tens of options (e.g. Shoe making, Russian, Maths, Music).
  - Students can be examined on **4 – 7 subjects**
  - Some **conditions** apply
- Old system was more restrictive

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## Example of new system

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| <ul style="list-style-type: none"><li>• Jason<ul style="list-style-type: none"><li>◦ Modern Greek</li><li>◦ Maths (Advanced)</li><li>◦ Physics</li><li>◦ Chemistry</li></ul></li></ul> | <ul style="list-style-type: none"><li>• Mary<ul style="list-style-type: none"><li>◦ Modern Greek</li><li>◦ Maths (Ordinary)</li><li>◦ History</li><li>◦ English</li><li>◦ Gymnastics</li><li>◦ Music</li></ul></li></ul> |
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Two candidates competing for one of the most popular fields of study in the last years (B.Ed. Primary Education)

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## Similar problems, different continents

- Lamprianou (2009)
  - Case studies 1–2: Two **Australian** methods: The New South Wales Average Marks Scaling method and the Tasmanian Qualifications Authority method (using Rasch models);
  - Case study 3: The **Fiji** scaling system;
  - Case studies 4–5: The **Singapore** T-score and the **Cyprus** z-score methods;
  - Case study 6: The **New Zealand** scaling system (recently abolished);
  - Case study 7: The **Scottish** Qualification Authority's National Ratings (not formally applied on students' reported scores);
  - Case study 8 (counter-example): The Pan-Hellenic University Entrance examinations in Hellas (**Greece**).

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## Summer Horror Stories in Cyprus

- Chemistry, a subject notorious among parents and students for 'consistently' being scaled down, has seen its enrolment dropping by 70% from 2001 to 2006
- Minister: *'We persuaded the Parliament that Scaling is a necessary evil'*
- Google 'Παγκύπριες εξετάσεις, αναγωγή' (Pancyprian examinations, scaling) for a free horror entertainment!



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## Summer Horror Stories in New South Wales

- The Australian Universities Admissions Centre (Frequently Asked Questions)
  - Are there subjects that are always scaled down?
  - Can I 'work the system' by choosing a specific combination of subjects?
  - Is it true that if I study this course I can't get a high scaled score, no matter what my raw score is?
- The Technical Committee on Scaling (2002): *'each year brings its own myths and conspiracy theories'*



- ... heated discussions in the Parliament



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## Summer Horror Stories in Fiji



- "...deceitful means ... scaling the marks... The Ministry is urged to review the scaling process...". (Parliament of Fiji, 2004)
- The heated discussions in the Parliament, (Parliament of Fiji, 2005) e.g. 'wrapped mind', 'selective memory', 'bigoted and condescending mannerisms'.
- The Fiji Human Rights Commission, summer 2006, alleged breaches of human rights.



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## Aim of the presentation (again)!

- Use recent empirical data from Cyprus to show how different subject comparability methods may affect the chances of groups of candidates to progress to Higher Education.

I will compare:

- **Scaling** method of the Cyprus Testing Service
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## The 'Cypriot' Scaling method

$$Y = 10 + 3 \cdot \frac{f(X) - \mu_{f(x)}}{\sigma_{f(x)}}$$

$$f(x) = \log \frac{x}{201-x}, \quad 1 \leq x \leq 200$$

$$T = \frac{1}{v} \sum_{j=1}^v Y_j$$

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## Competing models

- National Ratings
  - Correction Factors (Kelly, 1976)
  - Subject Comparisons - Sparkes (2000)
- Rasch model
  - Tognolini & Andrich (1996)
  - Lamprianou (2007), Coe (2008)
  - Tasmanian Qualif. Auth. (2000,2004)
- Multi-level model
  - Repeated Measures Design (Newton et al, 2007)

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## Decisions, decisions...

- Aggregate
  - raw scores?
  - the scaled scores using the 'Cypriot' method?
- Adjust using ...
  - the 'Scottish' National Ratings?
  - the Rasch model
  - MLM
  - ...or use the New South Wales average marks scaling ... or ... or ... or...




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## Significant variables ...

- Scores
  - raw scores
  - scaled scores using the 'Cypriot' method
  - 'Scottish' National Ratings
  - Rasch model measures
  - MLM estimates
- Independent variables
  - Gender, School, LEA, Type of school, Study Field
- N=5336 (M=2398, F=2938)

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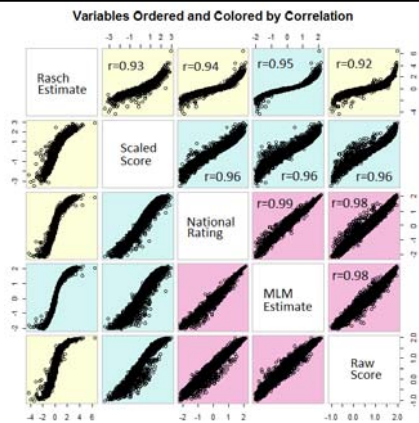
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## Results (I)




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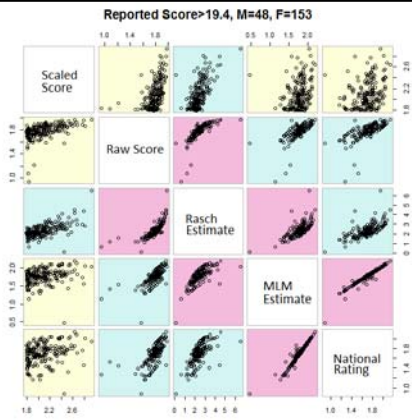
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## Results (2)



Iasonas Lamprilanou, University of Cyprus

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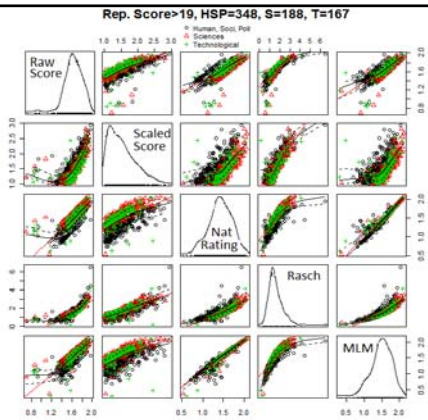
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## Results (3)



Iasonas Lamprilanou, University of Cyprus

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## Results (4)

- Jason (Score=19)
  - Medicine
  - Chemistry
  - Maths
- Nick (Score=18.5)
  - Chemistry
  - Maths
- Suzy (Score=18)
  - Maths
  - Chemistry
  - Primary Teacher

Iasonas Lamprilanou, University of Cyprus

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**Results (5)**

**If we use National Ratings instead**

		Nat. Ratings			
		Failure	Partial Failure	Success	
Scaling	Failure	3796	165	13	3974
	Partial Failure	100	631	39	770
	Success	28	93	471	592
		3924	889	523	
Improve	217				
No change	4898				
Worse	221				

Iasonas Lampranlou, University of Cyprus  
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**Results (6)**

**Type of School effect if we use National Ratings Instead of Scaling**

	Lyceum	Vocat. & Other
Improve	210 (4.2%)	7 (2.3%)
No change	4640	258
Worse	180 (3.1%)	39 (13%)

Note: 63% of Lyceum but 18% of Vocational and Other schools attempt to secure a position at Higher Education.

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**Results (7)**

**Graduation year effect if we use National Ratings Instead of Scaling**

	Graduation Year		
	<2006	2006	2007
Improve	4 (2.3%)	6 (3%)	207 (4.1%)
No change	153	193	4552
Worse	15 (8.8%)	4 (2%)	202 (4.1%)

$\chi^2(2)=13.503, p=0.009$

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Results (8)

### Field of study effect if we use National Ratings Instead of Scaling

	Field of first preference %				
	Human, Soci, Polit.	Sciences	Health	Technol ological	Econ & Admin
Improve	2.5	9.6	2.6	5.7	3.2
No change	91.2	87.5	94.8	91.6	91.9
Worse	6.3	2.9	2.6	2.7	4.9
Total N=	1675	585	1221	1081	774

X<sup>2</sup>(8)=104.96, p<0.001

Linear Regression. DV: Z score of National Rating. I.V.: Field of Study

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	0.045569	0.005676	8.028	1.21e-15 ***
Z score of Scaling	0.935814	0.003498	267.545	< 2e-16 ***
Sciences	0.222743	0.011056	20.148	< 2e-16 ***
Health	-0.062888	0.008847	-7.108	1.33e-12 ***
Technological	0.106102	0.008973	11.825	< 2e-16 ***
Econ & Admin	0.046187	0.010029	4.605	4.21e-06 ***

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Results (9)

### Gender effect if we use National Ratings Instead of Scaling

	boy	girl
Improve	96	121
No change	2225	2673
Worse	77 (3.2%)	144 (4.9%)

x<sup>2</sup>(2)=9.62, p=0.008

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Results (10)

### Ordinal logistic model (if we use National Ratings Instead of Scaling)

	Coeff	S.E.	Wald z	P
y=Partial Failure	-3.6343	0.1520	-23.91	0.0000
y=Success	-7.8181	0.2212	-35.35	0.0000
Scaling=Partial Failure	4.8245	0.1309	36.85	0.0000
Scaling=Success	8.5597	0.2006	42.67	0.0000
Gender=girl	0.2914	0.1111	2.62	0.0087
Field=Sciences	1.3337	0.1597	8.35	0.0000
Field=Health	0.1670	0.1580	1.06	0.2906
Field=Technological	1.0453	0.1536	6.80	0.0000
Field=Econ & Admin	0.4995	0.1615	3.09	0.0020
School Type=Other	-2.2621	0.3850	-5.88	0.0000
School Type=Vocational	-1.1006	0.2871	-3.83	0.0001
Area=rural	-0.1295	0.1312	-0.99	0.3238
Area=sundry	-0.1814	0.1245	-1.46	0.1453

Failure is the reference category of the D.V. (National Rating)  
 Failure is the reference category of the I.V. Scaling  
 Human., Social, Polit. Sciences is the ref. cat. Of the I.V. Field  
 Lyceum is the reference category of the I.V. School Type  
 Urban is the reference category of the I.V. Area

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## Summary of findings...

- Different Comparability methods affect reported scores in a different way (although the correlations are high)
- Differential effect on specific sub-groups
  - Type of school
  - Field of study
  - Gender
  - etc

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## Summary of findings...

- Adjusting examination scores → Politics
- Forced (i.e. or hurried decisions can have severe unintended consequences)

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## Messages for the British context...

- Logistical and Technical issues: many Boards, Syllabi etc (Admissions tests → who is favoured?)
- Differential effect on sub-groups: Social mobility and Educational stratification in the years of austerity?
- Politics and the neo-liberal view of Higher Education: centralization, accountability, conformity, regulation?

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## Messages for the British context...

- Conformity vs Free Choice
  - Equal access to information?
  - Equal ability to process information?
  - Equal opportunity to make best choices?
- Political rather than technical decisions
  - Ethical issues
  - Legal issues (case study)
- Future research → Focus on the consequences

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