QUALIFICATION AND DURATION AS MEASURES OF LEVEL OF EDUCATION IN THE ESS R1-R11

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- This research is an extended version is the PhD thesis: Schröder, Heike. 2014. *Levels and Loadings. Two Methods to Improve the Measurement of Education in Comparative Research*. Amsterdam: VU University.
- Earlier version of the presentation:
  - Ganzeboom, Harry BG (2018). "Qualifications and Duration as Measures of Level of Education". *Presentation Amsterdam Center for Inequality Studies*, Amsterdam, UvA, July 6 2018.
  - Ganzeboom, Harry BG – 2023 – Qualification and Duration as Measures of Level of Education **with special reference to ISSP. Presentation at European Survey Research Association, Milan (IT), July 19, 2023.**

Duration and Qualification Measurement (ESS-R11)

Duration: About how many years of education have you completed, whether full-time or part-time? Please report these in full-time equivalents and include compulsory years of schooling.

Qualification: What is the highest level of education you have successfully completed?

> [To be asked as a country-specific question. To be recoded into the ESS Education Detailed ISCED Coding Frame].

A short history of duration measurement in ESS

- Has always been the same

A short history of qualification measurement in ESS

- ESS (R1-R4; 2002-2008)) proposed using ISCED97 main levels as a template. Countries could use country-specific categories if they wanted.
- Harmonization: EDULVL (0-6), which was later revised to EDULVLa (1-5). The original information on EDULVL was removed from the dataset.
- The country-specific information is only available in country-specific datafiles without further harmonization.
- However, it was secured and harmonized by Schröder (2014). Available upon request.
- In R5 (2010) a provisional version of the new ISCED-2011 inspired the new template: EDULVLb (3 digits: 000 - 800). It was enhanced by Silke Schneider, as a follow-up to Schneider, Silke L. 2009. “Confusing Credentials: The Cross-Nationally Comparable Measurement Of Educational Attainment.” Oxford University.
- A new harmonization was launched: EISCED (0-7). EDULVLa can be constructed from EDULVLb, but is not provided in the data.
- Country-specific measures became part of the main datafile

ISCED2011 – EDULVLb – EISCED

- EDULVLb is not fully compatible with ISCED-2011
  - Same / similar categories have different codes
  - There is no 1-1 mapping in either direction. The most important difference is that EDULVLb makes a distinction between University Preparation and Higher Vocational Preparation in Upper Secondary. In NL: HAVO – VWO.
- The naming on the variables is rather confusing: EDULVLb (detailed classification) should have been called EISCED, and EISCED (cross-national harmonization) should have been called EDULVLb.

Scaling harmonization vs common-denominator harmonization

- Common-denominator harmonization is the most often used harmonization strategy. It has two major disadvantages:
  - It assumes equality (rather than equivalence) between categories.
  - It involves loss of information → introduces random error in the data.

  The more data you have to harmonize, the worse these problems become.
- Alternative: scaling harmonization
  - Assume a (single) latent dimension underlying all qualifications
  - Score all (country-specific) qualifications relative to one another on this dimension.
  - (One often applied scoring method is by formal or actual duration)
  - Scaling harmonization may also introduce (random) error in the data. If the attenauation is substantive it can be corrected using errors-in-variable models (SEM).

ISLED: International Standard Level of Education

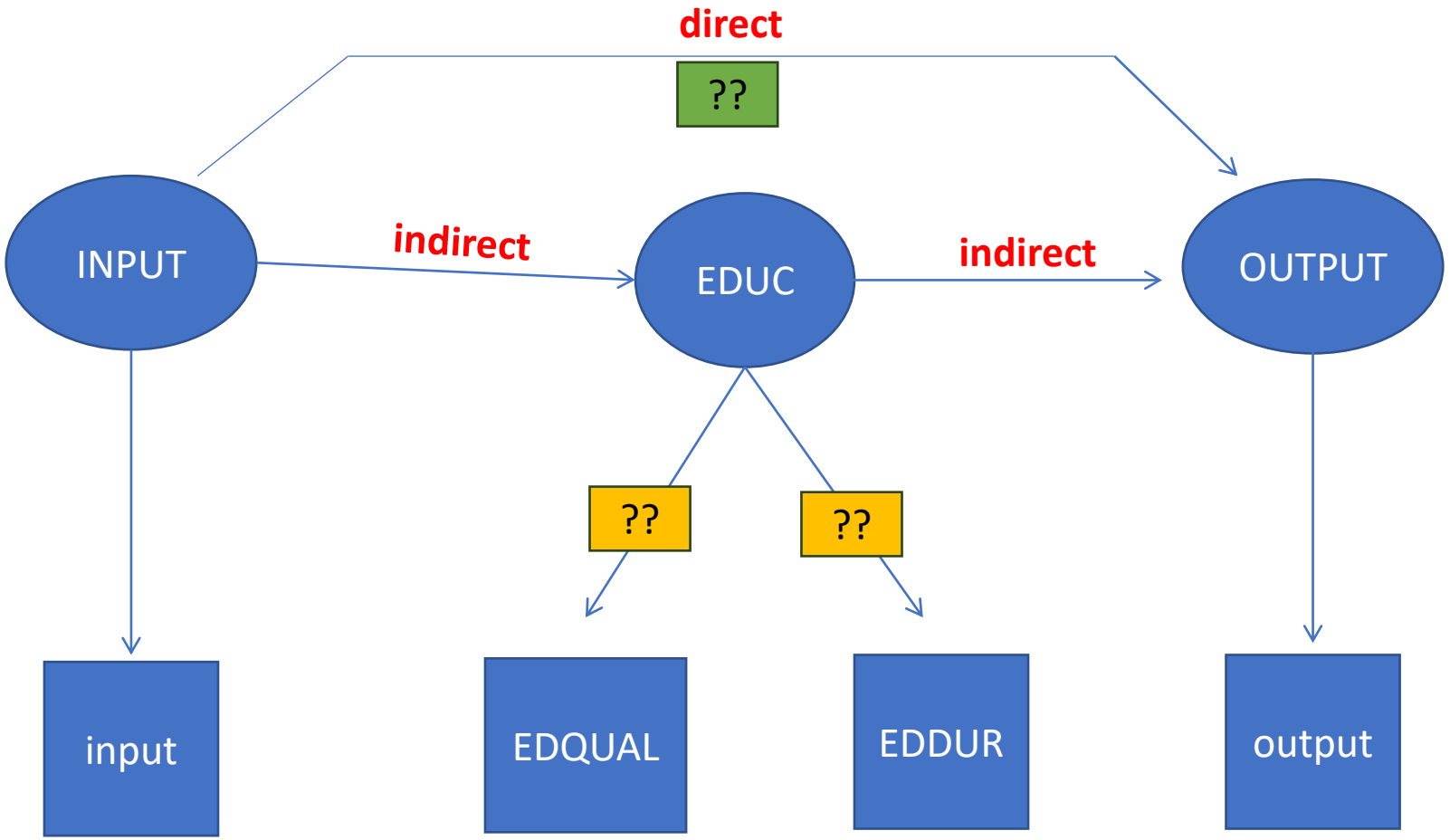
- Schröder (2014); Schröder & Ganzeboom (2014) developed ISLED using an optimal scaling method.
- Initially on all (country-specific) qualifications in ESS R1-R4 (some 1500).
- Ganzeboom & Schröder (2016) extended ISLED to ISCED-2011 and EDULVLb using ESS R5-R6.
- (Notice that ISLED is based on European data. I am working on a world-wide version, using ISSP data.)
- See: http://www.harryganzeboom.nl/ISLED/index.htm.

ISCED	ESS	EDULVLB	NL	ISLED
010, 020, 030	0	Not completed ISCED level 1	LO-	17.4
100	113	ISCED 1, completed primary education	LO	21.3
252	129	Vocational ISCED 2C < 2 years, no access ISCED 3		37.1
243	212	General/pre-vocational ISCED 2A/2B, access ISCED3 vocational	LBO	31.4
244	213	General ISCED 2A, access ISCED 3A general/all 3	MAVO	28
253	221	Vocational ISCED 2C >= 2 years, no access ISCED 3		25.3
253	222	Vocational ISCED 2A/2B, access ISCED 3 vocational		33.2
	223	Vocational ISCED 2, access ISCED 3 general		27.4
251, 253, 254	229	Vocational ISCED 3C < 2 years, no access ISCED 5	kMBO	32.9
342	311	General ISCED 3 >=2 years, no access ISCED 5		34.7
343	312	General ISCED 3A/3B, access ISCED 5B/lower tier 5A	HAVO	37.5
344	313	General ISCED 3A, access upper tier ISCED 5A/all 5	VWO	39.7
351, 353	321	Vocational ISCED 3C >= 2 years, no access ISCED 5	MBO23	46.2
354	322	Vocational ISCED 3A/3B, access 5B/lower tier 5A	MBO4	56.8
354	323	Vocational ISCED 3A, access upper tier ISCED 5A/all 5		45.8
443	412	General ISCED 4A/4B, access ISCED 5B/lower tier 5A	MBO+	59
444	413	General ISCED 4A, access upper tier ISCED 5A/all 5		50.6
453	421	ISCED 4 programmes without access ISCED 5		48
453	422	Vocational ISCED 4A/4B, access ISCED 5B/lower tier 5A		54.9
454	423	Vocational ISCED 4A, access upper tier ISCED 5A /all 5		52.4
540	510	ISCED 5A short, intermediate/academic/general tertiary below	WO-	70.2
550	520	ISCED 5B short, advanced vocational qualifications	kHBO	53.6
640	610	ISCED 5A medium, bachelor/equivalent from lower tier tertiary	HBO-BA	72.5
650	620	ISCED 5A medium, bachelor/equivalent from upper/single tier	WO-BA	80
740	710	ISCED 5A long, master/equivalent from lower tier tertiary	HBO-MA	81.5
750	720	ISCED 5A long, master/equivalent from upper/single tier tertiary	WO-MA	83
800	800	ISCED 6, doctoral degree	PhD	91.5

Research question today

- What is the best (comparative) measurement of **level of education** in ESS R1-R11?

Mediation validation model



OED: Origin – Education – Occupation

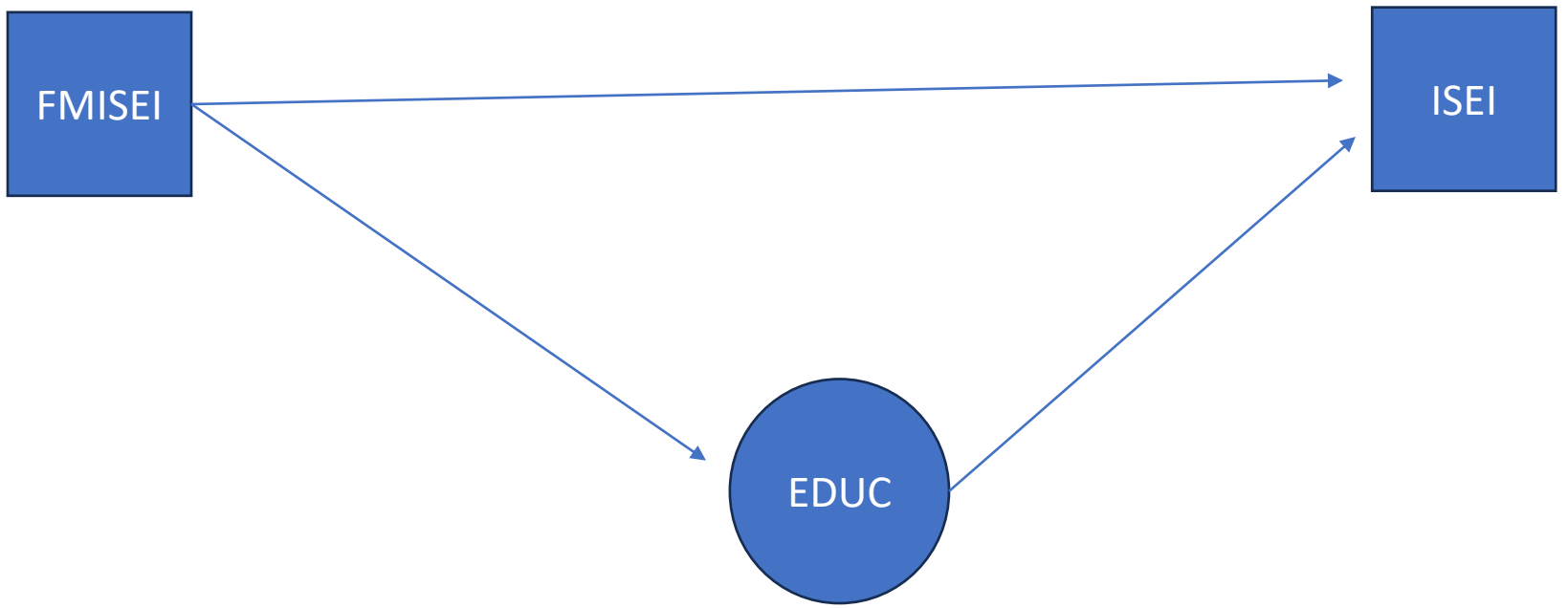


Table 1: Random error in qualification and duration measurement of education, Model A: qualifications scaled by ISCED five main levels (EDULVLa). Model B: country specific qualifications scaled by International Standard Level of Education [ISLED]. Source: ESS R1-R8, 36 countries, N=393,415.

	Model A		Model B	
	EDULVLa	EDDUR	ISLED	EDDUR
All rounds	0.892	0.883	0.945	0.858
ESSROUND = 1	0.884	0.873	0.941	0.858
ESSROUND = 2	0.882	0.887	0.947	0.859
ESSROUND = 3	0.899	0.874	0.949	0.845
ESSROUND = 4	0.891	0.893	0.954	0.868
ESSROUND = 5	0.898	0.889	0.943	0.862
ESSROUND = 6	0.901	0.886	0.947	0.861
ESSROUND = 7	0.891	0.874	0.935	0.854
ESSROUND = 8	0.885	0.879	0.940	0.854

Table 4: Standardized parameter estimates of OED mediation model with different measurement of the mediator

	Multiple indicator measurement			Single indicator measurement			
	ISLED	EISCED	EDULVLa	EDDUR	ISLED	EISCED	EDULVLa
Structural							
EDUC -> ISEI	0.661	0.652	0.644	0.523	0.612	0.605	0.571
FMISEI --> EDUC	0.417	0.412	0.404	0.377	0.386	0.382	0.349
FMISEI --> ISEI	0.051	0.059	0.069	0.138	0.088	0.095	0.129
Measurement							
EDDUR	0.851	0.862	0.871	1			
ISLED	0.945				1		
EISCED		0.944				1	
EDUVLa			0.907				1

ESS-R11, N=40,094 (available data). N-countries=24. All variable standardized within countries.

Recommendation on how to best measure level of education ESS R1-R11

- Combine detailed qualification measure, scaled in ISLED, and duration using a **latent variable measurement model**.
- Combine harmonized qualification measure (EDULVLa / EISCED) and duration using a **latent variable measurement model**.
- Average qualification measure and duration into a **composite (mean) index**.
- **ISLED** as a single indicator
- EDULVLa (**common denominator**) as a single indicator
- EDDUR (=**EDUYRS trimmed**) as single indicator
- **This will give 0%, 1-2%, 4%, 6%, 10%, 14% attenuation of any correlation with level of education.**

Take-home message

It is better to use a bad second indicator than to use a single indicator.