

How constant is the Treiman constant?

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Earlier presentations

- Cambridge Social Stratification Seminar, Amsterdam, VU, August 29 2019
- SILC Seminar VU Amsterdam (online), November 16 2021

Contents

- The Treiman constant
- The SEI optimal scaling model
- (Redesigning the ISEI measure for ISCO-08)
- The validation model / MTMM
- Country-specific versus international scales
 - Suriname: Sno & Ganzeboom (2017)
 - Argentina: Jaime (2020)
 - Netherlands: Kerkhoven (2018), Baars (2021)
 - Cross-national (ISSP, ESS) – Ganzeboom, under construction

Questions / point of discussion

- Is the question (“How constant is the Treiman constant?”) an interesting research agenda?
- How is it possible that country-specific occupational status scales – if properly constructed – are inferior to their international counterparts?
 - Is it in the level of detail in the data used to construct the scales?
 - Pooling of men and women?

Conclusions

- The Treiman constant is not about the prestige, but rather about the SEI scaling of occupations.
- The Treiman constant is pretty constant.
- The paper develops an exact measure of deviation from constancy = 1.0. Some early results (for Suriname) suggest a attenuation as large as 7-9%, but newer results (in Europe, Netherlands, Argentina) suggest the deviation is much closer to 0%.

THE TREIMAN CONSTANT

The Treiman constant

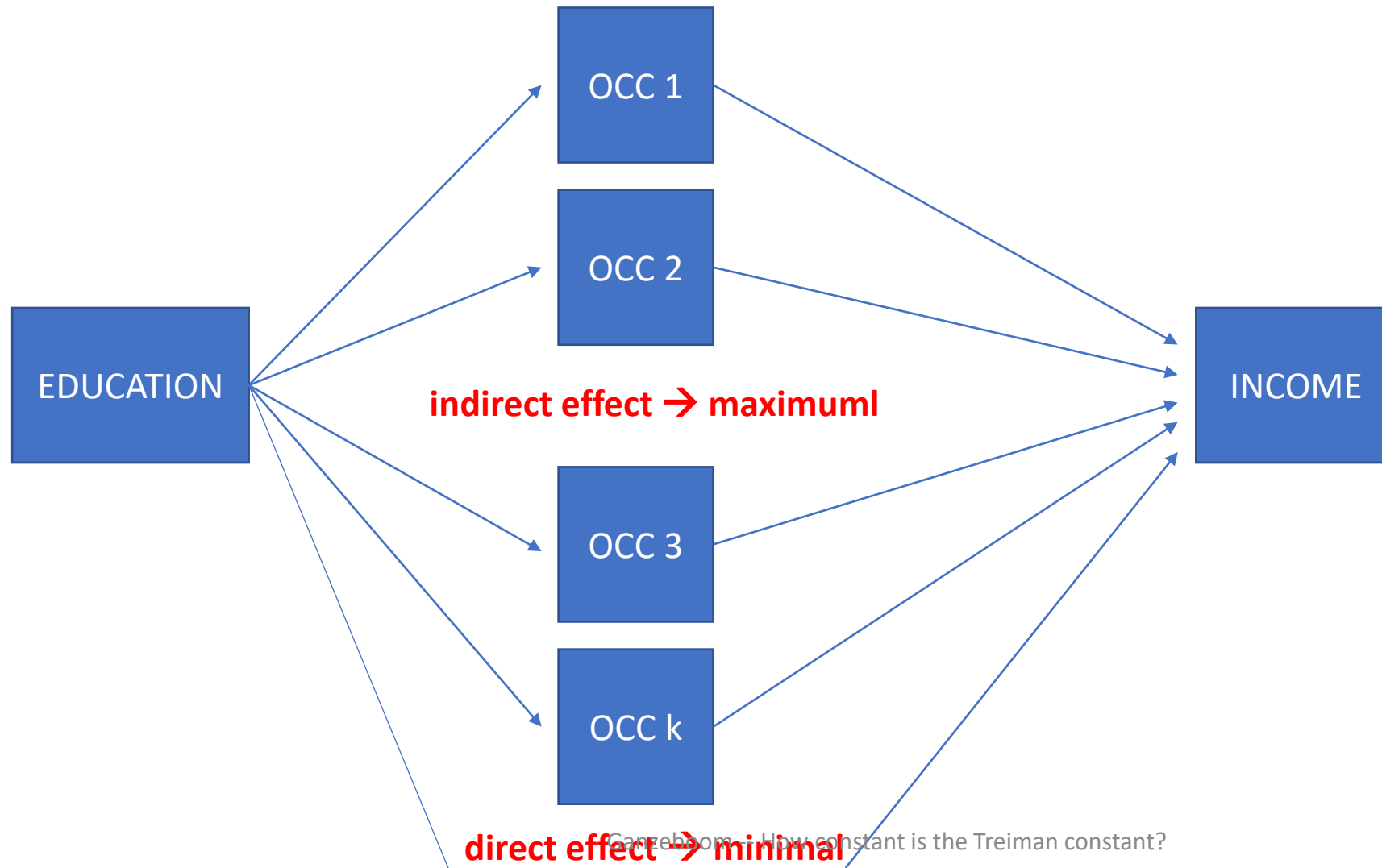
- Treiman (1977: 183): *“occupational prestige hierarchies are substantially similar throughout the world”*.
- Hout & DiPrete (2006: 2-3): *“Occupations are ranked in the same order in most nations and over time”; “the Treiman constant may be the only universal sociologists have discovered—not just in stratification but sociology as a whole”*.
- Evidence (Treiman): Prestige rankings of occupations correlate around 0.90 between – very – different societies and historical periods.
- Earlier statements of the constant: Inkeles & Rossi (1956) and Hodge, Siegel & Rossi (1964).

Treiman's explanation

- Prestige similarity reflects “similarity in skills and privilege between occupations”, which Treiman then understands as education and earnings.
- Treiman's explanation refers to the socio-economic theory of occupational status attainment – the SAT model that motivates the socio-economic index [SEI] scale of occupational status:
 - Universal technological requirements determine required skill levels of occupations.
 - Universal market mechanisms determine earnings level of occupations.
- However, prestige scaling of occupations differs from SEI scaling because of its **honorific** component. Cf. the waitress and the prostitute.
- → SEI hierarchies of occupations should be even more similar between societies than prestige hierarchies.

THE SEI OPTIMAL SCALING MODEL

SEI optimal scaling model



SEI

- Occupation == the mechanism that transfers education into earnings.
- The scaling is obtained as a ‘path-als’ optimization problem (developed by De Leeuw (1992)). See: Ganzeboom et al. (1992).
- Notice that the SEI optimal scaling model (unlike Duncan’s (1961) procedure) makes NO reference to prestige.
- Substantively, the SEI optimal scaling model is still identical to what Duncan (1961) actually did: averaging occupational earnings and occupational educational requirements.

ISEI-68 and ISEI-88

- ISEI-68 and ISEI-88 were constructed on ISCO-68 and ISCO-88 data using optimal scaling of indirect effect EDUC → OCC → INC.
 - ISEI-68 (Ganzeboom et al. 1992) used data on 70.000 men from the International Stratification and Mobility File)
 - ISEI-88 (Ganzeboom & Treiman, 1996) used data on 140.000 men from the ISMF.
 - Note that different samples were used; choice depended upon the presence of ISCO-68 or ISCO-88 codings (often converted from national classifications).
- Despite the presence of social mobility data, the construction of ISEI did not use parental (nor spouse's) occupations.
- Ganzeboom et al. (1992) compared the ISEI-68 scaling to five country-specific SEI scales (US NL BR AU CA) and did not find a better performance of the country specific scales.

Sources

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- Ganzeboom, Harry BG. 2010. *A New International Socio-Economic Index [ISEI] of Occupational Status for the International Standard Classification of Occupation 2008 [ISCO-08] Constructed with Data from the ISSP 2002-2007; with an Analysis of Quality of Occupational Measurement in ISS. [Working Paper]*. Amsterdam: Departmen of Social Reserarch Methodology VU University.

REDESIGNING ISEI FOR ISCO-08

ISCO-08

- In 2011 (effectively) ILO launched the new International Standard Classification of Occupations 2008 (ISCO-08).
- ISCO-08 is a 'minor' upgrade from the former ISCO-88:
 - 10% more distinctions made
 - Major group (first digit) structure remained nominally intact; however, as sub-major and minor groups are shifted between major groups, this does not imply 100% equivalence at the major group level.
 - About 70% of all unit groups ('occupations') have a one-to-one mapping between ISCO-88 and ISCO-08.
- ISCO-08 contains some striking revivals from the earlier ISCO-68: Manual Supervisors is the most striking one.

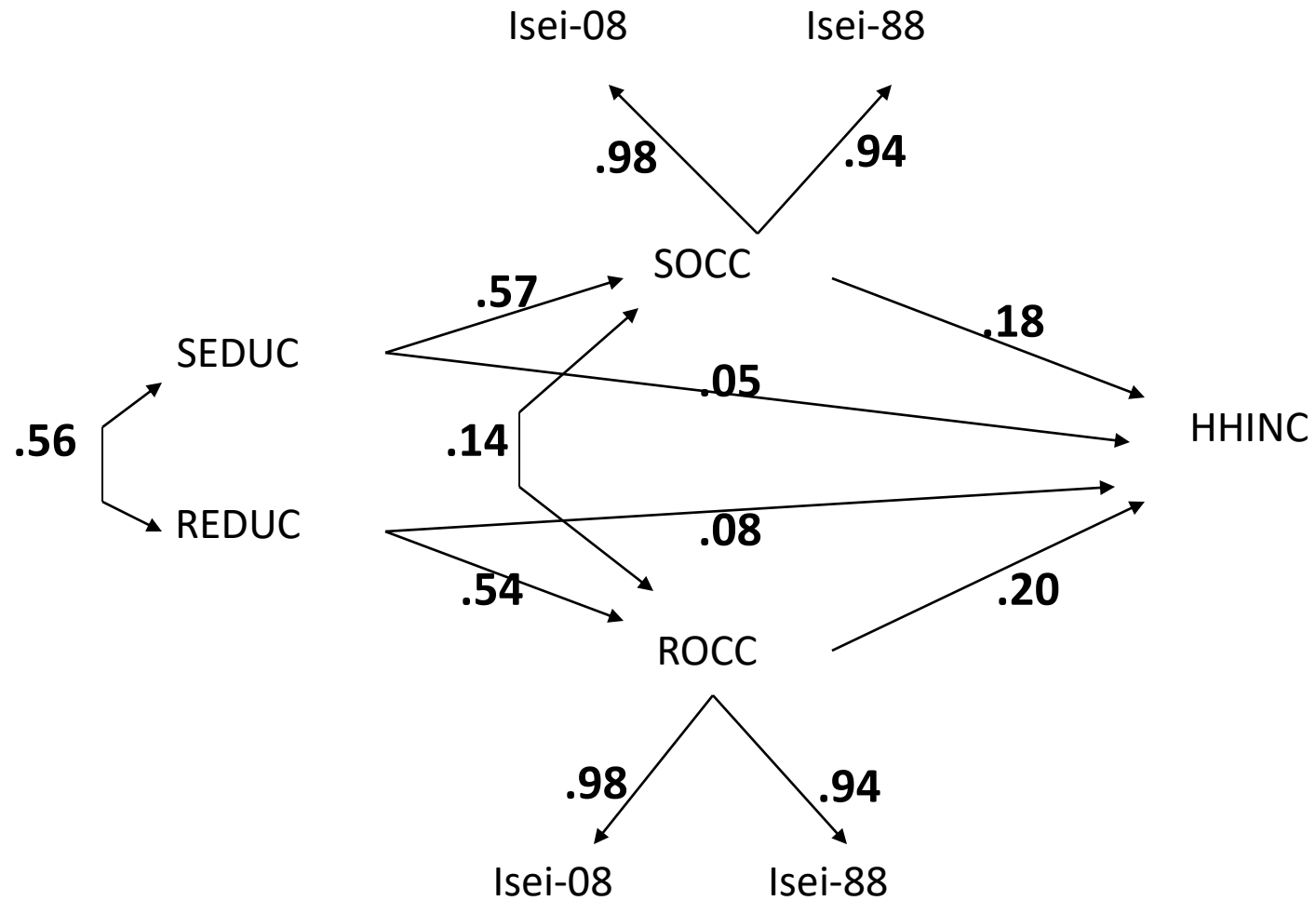
Provisional ISEI-08 construction

- Ganzeboom (2010) presents a provisional version of ISEI-08 using data on 200.000 men **and women** in 42 countries in ISSP 2001-2007.
- These ISSPs contains only ISCO-88 (!!) coded occupation data. ISCO-08 was obtained by **converting** ISCO-88 into ISCO-08, using a 'best one-to-one mapping'. Further adaptations were made in two instances:
 - Manual Supervisors were created using information on supervising status.
 - Shopkeepers and Farmers were created using information on self-employment.
- Ganzeboom (2010) also proposed a validation model to compare the quality of the ISEI-88 and ISEI-08 scales using fresh data from the ESS which is essentially an MTMM model. Measurement coefficients: 0.94 and 0.98.

To be added: repeat on ISSP 2014-2020

THE VALIDATION MODEL

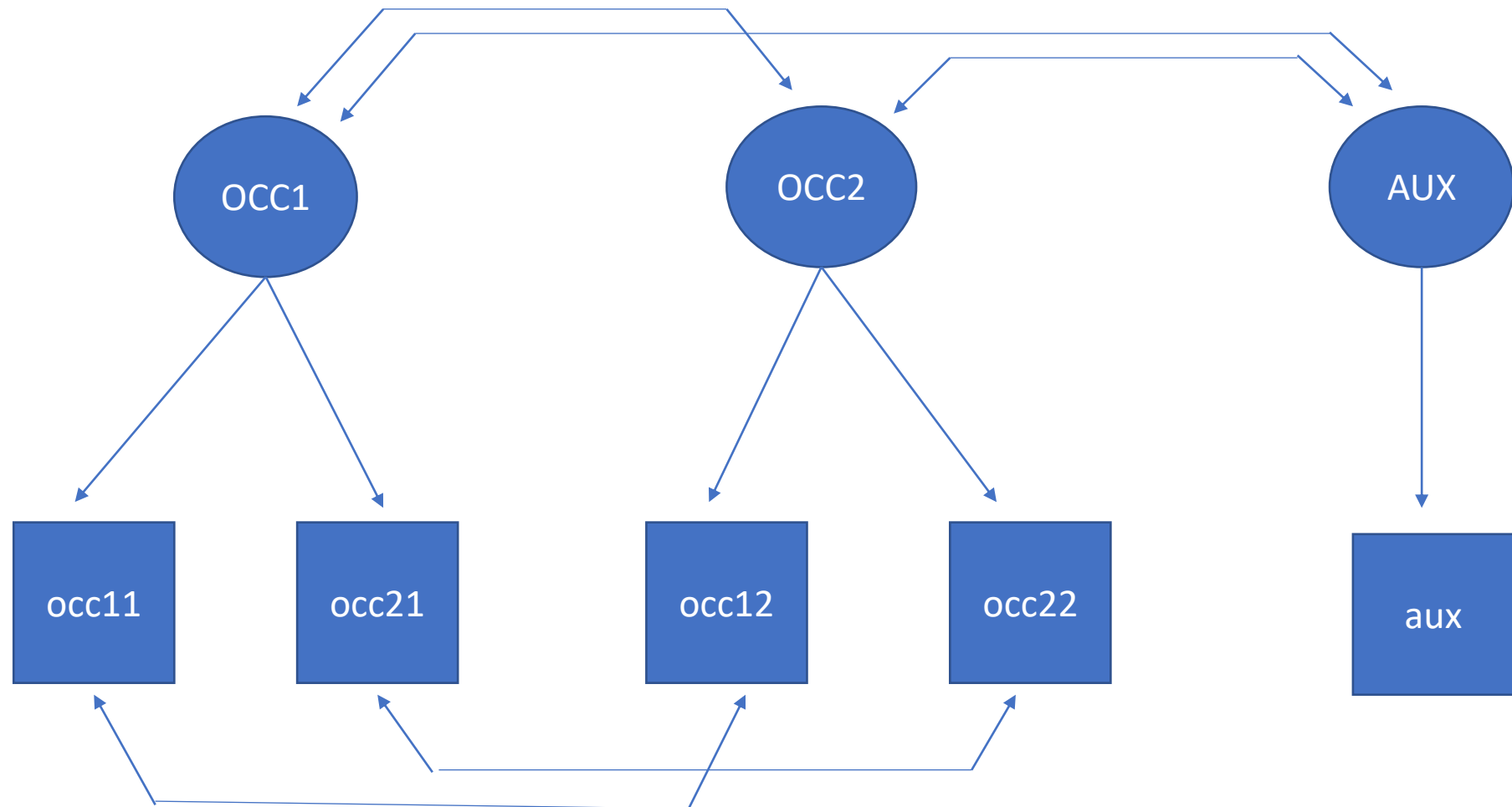
ESS validation model (Ganzeboom, 2010)



The validation model

- Uses fresh data to compare the quality of (two) different (new, old) measures.
- The model has multiple occupations: respondent – spouse. (This could be expanded with parental occupations.)
- The model estimates the quality of measurement using **two** social processes: $EDU \rightarrow OCC \rightarrow INC$ (status attainment), and $OCC \leftrightarrow SOCC$ (occupational homogamy).
- Model is equivalent to MTMM model with auxiliary variables.

MTMM model with auxiliary variables



Testing the Treiman constant / estimating the loss of information when assuming the Treiman constant

- The (MTMM) validation model gives a direct estimate of the loss of information when using the Treiman constant, and a test.
- E.g.:
 - Measure 1: cross-national scaling;
 - Measure 2: country-specific scaling.
- The MTMM model contains “systematic measurement errors” == method effects.

EMPIRICAL RESULTS

References

- Sno, Tamira E & Harry BG Ganzeboom. (2017). “De beroepenstratificatie van Suriname: Hotdog of Broodje Pom?” Academic Journal of Suriname (8), pp. 715-732.
- Kerkhoven, Megiel. (2019). “De Beroepenstratificatie van Nederland. Een toets van de Treiman constante.” Amsterdam: Vrije Universiteit [BA thesis Opleiding Sociologie].
- Jaime, Sofia (2020). “The occupational stratification of Argentina.” Madrid ES: Universidad Ponticia Comillas [MA thesis].
- Baars, Vivian. 2021. “International or Country-Specific Measurement of Occupational Stratification? The Case of the Netherlands.” [MA thesis Research Master's Programme: Methodology and Statistics for the Behavioural, Biomedical and Social Sciences, Utrecht University]

The occupational stratification of Suriname

- Sno & Ganzeboom (2017) developed a SR-SEI for Suriname, and compared it to ISEI-88 using an MTMM validation model.

	ISEI88	SRSEI
Measurement	0.88	0.96

- This implies that any correlation with occupational status in Suriname is underestimated with 9% ($0.88/0.96$), when estimated with ISEI-88 in stead of the country-specific Surinamese scale.
- This is a direct answer to the question: how constant is the Treiman constant?

The occupational stratification of Argentina

- Jaime (2020); Jaime & Ganzeboom (2021) developed a Argentinean SEI scale (ARSEI) and compared it to ISEI-88 and ISEI-08, basically using the same methodology as Sno & Ganzeboom (2017).
- ARSEI was developed on Permanent Household Survey PHS 2015, N=50.000 men and women. Test on a social mobility survey PISAC-ENES 2014, N=20.000 men and women.

	ISEI-08	ARSEI
Measurement	0.942	0.918

- ***We have not been able to construct an ARSEI that is better than the international counterpart...***

De Beroepenstratificatie van Nederland

- Megiel Kerkhoven ontwikkelde een NLSEI op de Nederlandse steekproeven uit EU-SILC en vergeleek deze met ISEI08 in ESS data, zonder een formeel MTMM model te schatten.
- Level of detail: ISCO submajor groups.
- De correlaties laten duidelijk zien dat de internationale schaal net zo goed of beter doet als de nationale schaal.
- (Dit idee zou veralgemeend kunnen worden door een gepoolde oplossing te vergelijken met een country-specific oplossing.)

The occupational stratification of the Netherlands

- Baars (2021); Baars, Ganzeboom & Bakker (2021) developed an Netherlands scale (NLSEI) and compared it to ISEI-08, basically using the same methodology as Sno & Ganzeboom (2017).
- NLSEI was developed on a labour market survey (EBB), N=70.000 men and women. Tested on a ESS, NL samples, N=15.000 men and women.

	ISEI-08	NL-SEI
Measurement	0.963	0.945

- ***Again, we have not been able to construct a NLSEI that is better than the international counterpart...***

Baars results - discussion

- These are the best data available (and conceivable):
 - Register source
 - Large
 - Very detailed
- Results hold for both ISCO-08 (four digit) and BRC (country-specific condensation of ISCO-08).

CROSS-NATIONAL APPROACH

A cross-national approach

- In stead of comparing a csSEI to ISEI, it would be possible to developing an ISEI on cross-national data and compare a pooled (constrained) solution to a country-specific solution, estimated in each country separately.
- I have tried this – on and off – on EU-SILC, ESS, ISSP.

Steps

- Step 1a: Harmonize income data:
 - Divide by country-year specific mean and take logarithm
 - Standardize within country-year → ZLNPINC
- Step 1b: Harmonize education data
 - Standardize qualifications and duration by country-year.
 - Average qualifications and duration, and standardize with country-year → ZEDUC.
- Step 2: Define ISCO codes at most detailed (four digit) level. If $N < 20$, merge with contiguous categories.
- Step 3: Apply search algorithm to find optimal scaling. Step out when direct effect ZEDUC → ZPINC reaches minimum.
- Step 4: Generate 10..90 metric by applying anti-logistic transformation.
- Step 5: Generate ISEI-08 scores for 3-, 2-, and 1-digit groups by aggregation.

Cross-national approach: ESS 2014-2016

- Effective sample: N=93.125 men and women, 41 countries.
- Selections:
 - Age 21-64
 - WRKHRS > 12
 - Valid data on occupation (ISCO-08), education and personal income.
- Ca. 370 occupation unit groups with N > 20. 40 groups (N < 21) are merged with similar groups.
- Algorithm converges at $p = 0.35$ (education weight) and $1-p = 0.65$ (income weight).
- Temporarily: unit of measurement are Z-scores.

How is a country-specific SEI defined?

- #1: use a country-specific measure of education.
- #2: (there seems to be no equivalent for this for earnings).
- **#3: use country-specific scalings of occupation by education and earnings.**
- #4: use country-specific weights for averaging the education and income scaling of occupations.

For the time being, we only use #1 - #3, not #4.

Comparison between new cross-national and country-specific ISEI-08

- Results from MTMM validation model (based on 10 countries):

		ISEI-08	ISEI-08cs
• ESS	2014-2016	0.954	0.953

- ***Country-specific scaling does not improve measurement quality.***
- Plausible interpretation: Country-specific scaling brings in additional random error (smaller occupation groups), which wipes out the potential gains of country-specific scaling.

Complications

- The reliability of the scaling is of course dependent on the number of cases per occupation. In earlier work, the minimum N was set at $N > 20$. If an occupation has fewer incumbents, the group is merged with a neighbouring or otherwise similar group.
 - A country-specific SEI is estimated on much cruder data than a cross-national ISEI.
- Developing country-specific scale is one thing, applying them in a fresh data set such as ESS is quite another matter.

CONCLUSIONS

Conclusions & Discussion

- The Treiman constant is not about occupational prestige, but rather about SEI.
- The Treiman constant is pretty constant.
- The paper develops an exact measure of deviation from constancy = 1.0. Some early results (for Suriname) suggest a deviation as large as 9%, but the new results (in Europe) suggest the deviation is much closer to 0%.
- However, I may not have to right research design to test the Treiman constant...