How constant is the Treiman constant?

Harry BG Ganzeboom
Cambridge Social Stratification Seminar
Amsterdam, VU, August 29 2019
Conclusions

• 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 7-9%, but the new results (in Europe) 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: Prestige rankings of occupations correlate around 0.90 between – very – different societies and historical periods.
Treiman’s explanation

- Prestige similarity reflects “similarity in skills and privilege between occupations”, which Treiman understands as education and earnings.

- Treiman’s explanation thus refers to the socio-economic theory of occupational status attainment – SEI model:
  - Universal technological requirements determine required skill level 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 should be even more similar between societies than (net) prestige hierarchies.
The SEI model
SEI optimal scaling model

EDUCATION

OCC 1

OCC 2

OCC 3

OCC k

INCOME

direct effect → minimal
SEI

• Occupation == the mechanism that transfers your education into earnings.

• Note that the SEI optimal scaling model (unlike Duncan’s (1961) procedure) makes NO reference to prestige.

• The scaling is obtained as a ‘path-als’ optimization problem (developed by De Leeuw (1992)).

• Substantively, this is still identical to what Duncan (1961) 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 $\rightarrow$ OCC $\rightarrow$ 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.
Sources


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 (‘occupation’) 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


- These ISSP data contained 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.
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 → OCC → INC (status attainment), and OCC ↔ 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 using the Treiman constant

• The (MTMM) validation model gives a direct estimate of the loss of information when using the Treiman constant, and a test.

• Measure 1: cross-national scaling;

• Measure 2: country-specific scaling.
Early results on Suriname
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.

<table>
<thead>
<tr>
<th>ISEI-88</th>
<th>SR-SEI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement</td>
<td>0.88</td>
</tr>
</tbody>
</table>

• 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?
Redesigning the ISEI-08 measure
What has changed with ISCO-08?

• Many more (international and national) data are now published with ISCO codes: ISSP, ESS, EVS, GSS and many more: there is no longer a need to use conversions.

• ISCO-08 has been adopted by these projects, although the amount of pertinent data is still limited. E.g. ESS and ISSP changed to ISCO-08 in 2014 (2-3 rounds).

• Basing ISEI scores on men only has become (more) unacceptable.
Research Design to develop a new ISEI-08

• ISSP data 2014-2017:
  • 194,687 men and women from 41 countries. Reduces to 93,125 for the effective sample.
  • Worldwide coverage of countries.
  • Occupations (respondent and spouse) directly coded in ISCO-08.
  • Direct measure of personal income (which we assume to be occupational income for those actively employed at time of survey).
  • Detailed (country specific) education codes.

• Limitations / problems:
  • Effective sample may be too small.
  • There is quite a bit of variation in quality of the ISSP data, also in occupation coding (Ganzeboom, 2010).
Research questions

• Aim: construct ISEI-08 scale on ‘worldwide representative’, ISCO-08 coded data.

• Generalize the new scale to ISCO-88 and ISCO-68 by conversion of the occupation codes.

• Compare quality of new scale to ISEI-88 and ISEI-68 using an MTMM validation model (with multiple occupations) on fresh data.

• Cross-national vs country specific versions of the scale (the ‘Treiman constant’): how much difference does it make?
Steps

• Step 1a: Harmonize income data:
  • Divide by country-year specific mean and take logarithm
  • Standardize within country-year \( \rightarrow \) ZLNINC

• Step 1b: Harmonize education data
  • Standardize qualifications and duration by country-year.
  • Average qualifications and duration, and standardize with country-year \( \rightarrow \) 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 \( \rightarrow \) 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 results
Cross-national solution

- 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.
Comparison with provisional ISEI-08

• Results from MTMM validation model:

<table>
<thead>
<tr>
<th></th>
<th>ISEI-08t</th>
<th>ISEI-08</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISSP</td>
<td>2014-2017</td>
<td>0.96</td>
</tr>
<tr>
<td>ESS</td>
<td>2014-2016</td>
<td>0.94</td>
</tr>
</tbody>
</table>

This pattern does not change very much when leaving out countries from the validation model.

• *The provisional scale works better than the new one!!* This is hard to explain...
Country-specific results
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.
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 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.
Comparison between new cross-national and country-specific ISEI-08

• Results from MTMM validation model (based on 10 countries):
  • ESS 2014-2016  
    | ISEI-08 | ISEI-08cs |
    | 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.
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.