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Approaches to Ex-post Harmonization of Rating Scales in the Survey Data Recycling Framework

Irina Tomescu-Dubrow

Ilona Wysmulek

Survey Data Recycling Project on Ex-Post Harmonization, SDR
Cross-National Studies: Interdisciplinary Research and Training Program, CONSIRT
Institute of Philosophy and Sociology, Polish Academy of Sciences, Warsaw, IFiS PAN

Survey Data Recycling (SDR): analytic framework

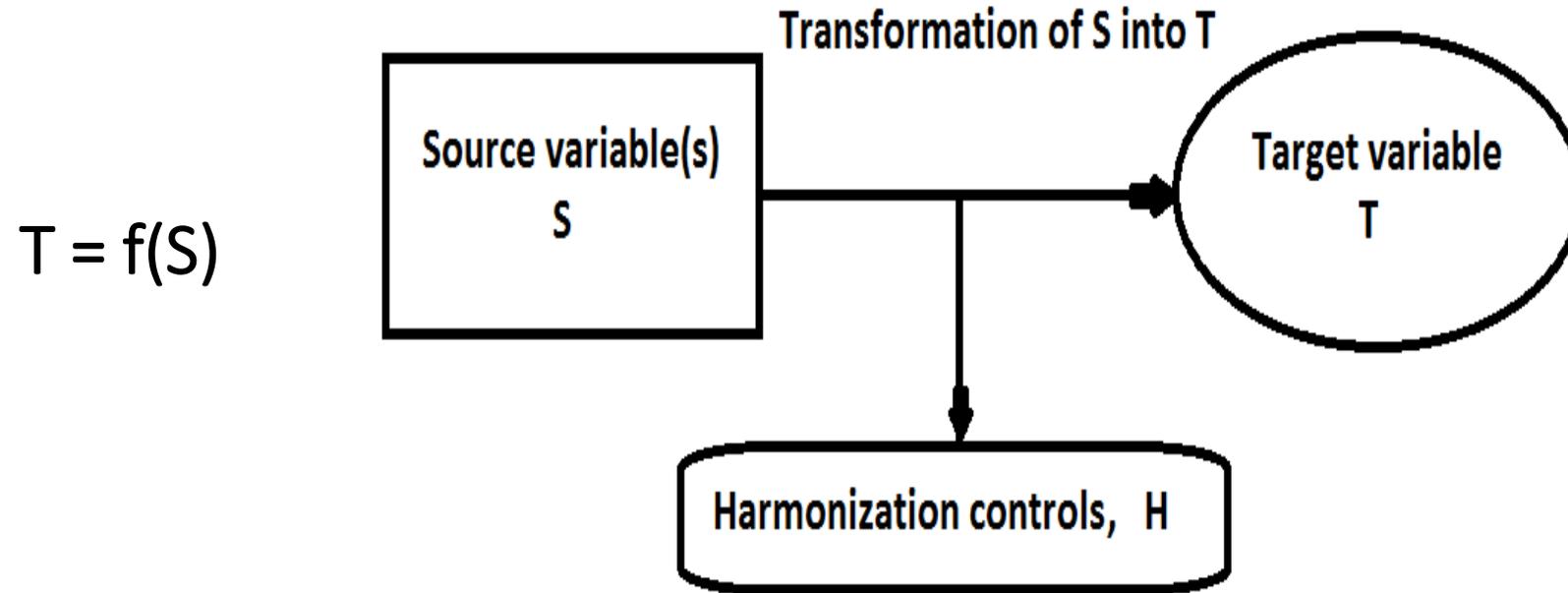
Construct control variables for:

- quality of source surveys
- process of ex-post harmonization

to account for methodological biases and errors in survey data that stem from:

- (a) deviations from standards of documenting and preparing survey data suggested in the specialized literature
- (b) inter-survey variability of harmonized items

Harmonization control variables



= new variables that record properties of the source survey items (e.g. wording, given scale characteristics)

= harmonization controls accompany the target variables in the harmonized dataset

SDR research areas: measures with scales

- Determinants of Political Engagement
 - Trust in the national parliament
 - Trust in the justice system
 - Trust in political parties
 - Trust in the government
 - Interest in politics
- Social Capital and Well-being
 - Trust in people
 - Satisfaction with life
 - Happiness
 - Self-assessed health Trust in people

Rating scales in SDR: definition

Rating scales = sets of ordered answers to closed-ended questions representing respondents' feedback involving valuation V , according to criterion or criteria C , of an object O

Valuation is expressed in terms of intensity of the fulfillment of C , where degree of intensity refers to answers ordered from lowest to highest

Ex-post harmonization of rating scales in SDR

Data: 23 survey projects with Ca. 3,400 national surveys 142 countries
from 1966 to 2017, N > 4 million respondents

Goal: maximally condense the information of source items measured via various types of rating scales, preserving formal properties of the original scales.

- identify formal properties of the source scales → harmonization controls
- order answer options so that all answers go from lowest → highest intensity of valuation
- decide on algebraic transformations for creating harmonized target scale(s)

SDR harmonization controls: source scales

- **Scale length:** its values range from 2 to 11
- **Scale direction:** dummy variable: 1 = intensity of valuation in the source scale is ascending; 0 = otherwise.
- **Scale polarity:** categorical variable: 1 = item-specific unipolar source scale; 2 = item-specific bipolar source scale; 3 = agree-disagree bipolar source scale.
- **Source-item wording:** dummy variable: e.g. the degree of trust (a common formulation) vs frequency of trusting government

Order answer options: lowest/highest intensity

The harmonization controls (length, direction, and polarity) are relevant for how we assign for each scale the consecutive numbers $k = 1 \dots n$, so that in answer options 1 indicates the lowest intensity of valuation, and n indicates the highest intensity.

Note: In the transformation of bipolar scales that measure the concept along two dimensions, we retain the dimension corresponding to the concept of substantive interest.

Two target scales in the SDR database

The newly assigned numbers $k = 1 \dots n$ (lowest to highest intensity of valuation) represent a preparatory scale for constructing two target scales:

1. 0-10 RANGE SCALE
2. DISTRIBUTIONAL SCALE

0-10 Range Target Scale in SDR

Linear transformation of source scales into **target scale with interval ranging from 0 to 10**

Independent of the length of the source scale + assuming equal intervals btw points:

- the mean value after transformation is the same, and
- the sum of differences between variances of scores is minimized

0-10 Range Target Scale in SDR: example

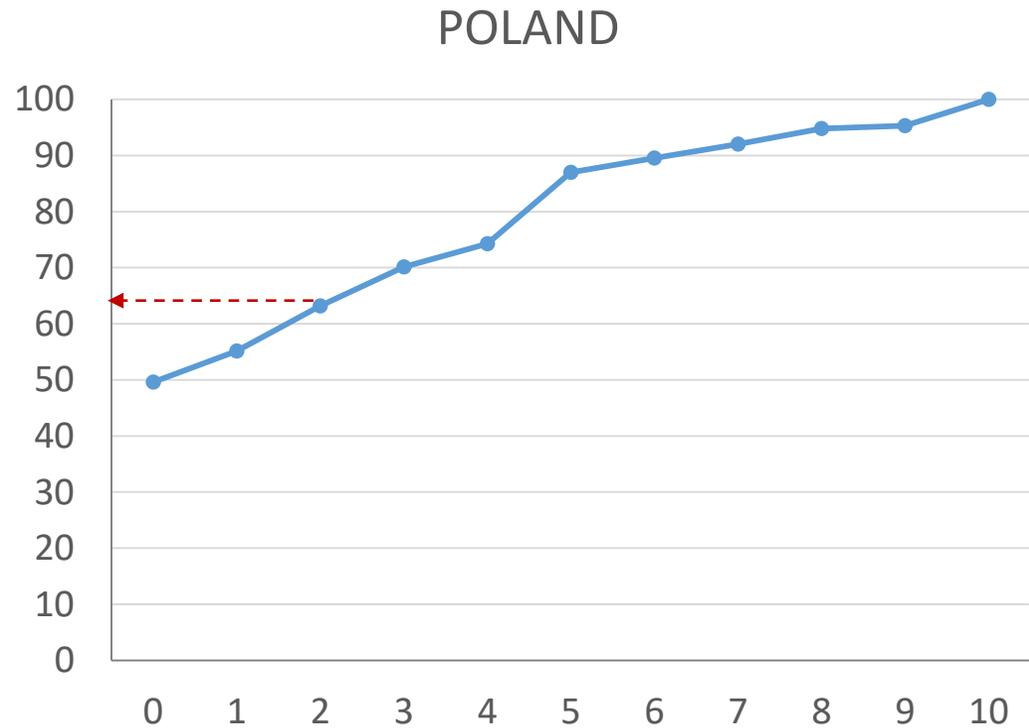
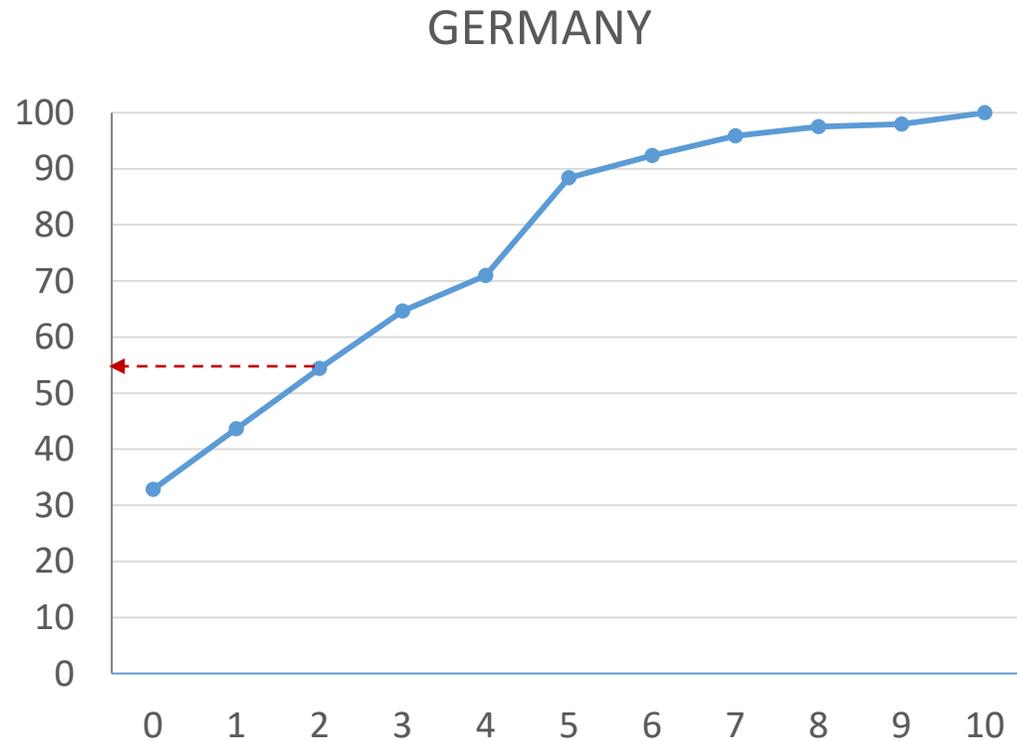
Original scale	Recodes	Mean	Variance	St. Dev.
11-points	0,1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0	5.0	10.00	3.16
10-points	0.5, 1.5, 2.5, 3.5, 4, 5.5, 6.5, 7.5, 8.5, 9.5	5.0	8.25	2.87
7-points	0.71, 2.14, 3.75, 5.00, 6.43, 7.86, 9.29	5.0	8.18	2.86
5-points	1.0, 3.0, 5.0, 7.0, 9.0	5.0	8.00	2.83
4-points	1.25, 3.75, 6.25, 8.75	5.0	7.89	2.79
2-points	2.5, 7.5	5.0	6.25	2.50

$$0-10_Range_Target_scale = (10/n*2) + (k - 1) *(10/n)$$

Distributional Target Scale in SDR

- Transformation takes into account the distribution of scores in a sample
- For a given sample, points on the target scale correspond to the mid-points of the cumulative distribution of scores
- Scores of the target scale are percentiles within a sample
- The sample distribution is such that:
 - the mean value ~ 50
 - the variance depends on the scale length

Distributional Target Scale in SDR: Example



DISTRIB_Target_Scale = Sum of individuals of scores $k-1$ + $(X_k / 2)$

Applications

0-10_Range_Target_scale can be used for comparing distributions across surveys: scores on the scale do not depend on the distribution

Not the case for **Distributional_Target_scale**: scores depend on the distribution, and for the original scale length the mean of the distribution is around 50

However, the percentile rank of individuals reflects well their location in the distribution.

This property is desirable for studying the relationship of the measured concept with other variables.

Analyses of the **0-10_Range_Target_scale** and **Distributional_Target_scale** in large set of surveys (whether in framework of ordinal/metric vars) should take into account harmonization controls, Length especially.

Thank you!



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Survey Data Recycling (SDR) database

Asian Barometer

Afrobarometer

Americas Barometer

Arab Barometer

Asia Europe Survey

Caucasus Barometer

Consolidation of Democracy

Comparative National Elections Project

Eurobarometer

European Quality of Life Survey

European Social Survey

European Values Study

International Social Justice Project

International Social Survey Programme

Latinobarometro

Life in Transition Survey

New Baltic Barometer

New Europe Barometer

Political Action II

Political Action - An Eight Nation Study

Political Participation and Equality

Values and Political Change

World Values Survey

Ca. 3,400 national surveys (i.e. project*wave*countries); 142 countries/territories, from 1966 to 2017
N > 4 million respondents