

## Harmonisation of demographic and socio-economic variables in cross-national survey research

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# Harmonisation of Demographic and Socio-Economic Variables in Cross-National Survey Research

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## Introduction

- 1 Demographic and socio-economic variables describe the context in which a person acts. Context or background variables are variables that "contain information necessary to define homogeneous subgroups, to establish causal relations between attitudes and societal facts, and to define differences between scores on scales." (Braun & Mohler, 2002: 112). In cross-national comparative research, standardised instruments or indices are available for only a small number of variables such as occupation (ILO, 1990), education (UNESCO, 1997/2003; Brauns, Scherer & Steinmann, 2003) and status (see Treiman, 1977; Goldthorpe, 1980; Ganzeboom & Treiman, 2003). Hoffmeyer-Zlotnik and Warner (2006; 2007; 2008) have developed instruments for the measurement of income, education and household variables in comparative European survey research, and work is in progress on an instrument for measuring ethnicity (Hoffmeyer-Zlotnik, 2003a). Apart from these instruments, I have co-formulated a set of rules for developing further instruments for measuring socio-demographic variables in cross-national research (Hoffmeyer-Zlotnik & Wolf, 2003).

## The translation process

- 2 At the beginning of the seventies, with cross-national survey research on the increase, Przeworski and Teune (1970: 96-97) identified the problems which it faced – problems which persist even today: "Direct measurement requires that the language of measurement be common to all observations, reflect relationships among the phenomena observed, and be consistently applied." In the authors' view, the first step towards establishing comparability in cross-national survey research was to overcome language barriers through the translation process.
- 3 Wilss describes translation as "a transfer process which aims at the transformation of a written source language text into an optimally equivalent target language text, and which requires the syntactic, the semantic and the pragmatic understanding and analytical processing of the source language text" (1982: 3). Researchers involved in cross-national research soon became familiar with the concept of functional equivalence, which stresses the importance of transferring meaning as opposed to translating literally and which emphasises the fact that an iterative process of back-translation enhances face validity in the intercultural use of measurements. Face validity is achieved when a test appears valid to examinees who take it, personnel who administer it and other untrained observers (Duquesne University, 2005).
- 4 In cross-national research, translation typically proceeds as follows:
  - There has usually been prior agreement that one language – generally English – will be the reference language.
  - A drafting group is set up to formulate the questionnaire. Not only are native speakers of the reference language (English) members of this drafting group, they are also language experts and experts on their own cultural background. As a result, the blueprint of the questionnaire often has a British cultural bias.
  - Next, a bilingual but monocultural member of the respective national project teams translates the questionnaire. If an item is translated from one language to another without analysing its cultural background in the (culturally-biased) master copy, and if the national translator does not properly understand the concept of functional equivalence, the meaning can get lost in translation (Braun, 2006).

- 5 By contrast, the translation process developed for the European Social Survey (ESS)<sup>1</sup> is state of the art. Translation procedures are carried out by three different sets of people working as a team — the translators, the reviewer(s), and the adjudicator:
- The ESS calls for two translators per questionnaire. They should be skilled practitioners with training in translating questionnaires. They translate from English (the language of the blueprint) into their mother tongue.
  - The reviewers, who are also bilingual, must have at least as good translation skills as the translators. In addition, they should be sociologists "familiar with questionnaire design principles, as well as the study design and topic" (Harkness, 2007: 5). If a person with these skills cannot be found, two reviewers who fulfill the different aspects of the reviewer's role may be engaged.
  - The adjudicator "is responsible for the final decision about which translation options to adopt, preferably in co-operation with reviewers and translators" (Harkness, 2007: 5). Ideally, the national coordinator of the study should also act as adjudicator.
- 6 ESS translation and assessment is a communication process which not only involves translation, review and adjudication, but also pretesting (cognitive pretesting techniques are often the most fruitful means of testing bicultural questionnaires) and documentation. All five procedures are interrelated and every decision is documented.
- 7 Translation problems stem mainly from lack of knowledge or awareness of cultural differences. A translating team which is bilingual but not bicultural cannot completely understand cultural differences. In such a case, functional equivalence is difficult to achieve. Ideally, therefore, all roles in the translation team (translators, reviewers and adjudicator) should be filled by persons with a bicultural background so that they can competently discuss the correct wording of a question.

## The Harmonisation Process

- 8 Harmonisation is not a linguistic transfer of words or sentences from one language to another, but rather a sociological process in which socio-demographic indicators are transferred from one culture or country to another.
- 9 Although international data collection programmes use different harmonisation techniques, they all share a high level of methodological consciousness:
- 10 *Output harmonisation* is normally performed on an ex-post basis. It starts with a common, internationally-agreed definition of a variable representing a common indicator. The target variable to be surveyed is determined. The selection of suitable survey methods is left to the participating researchers and the survey is conducted using a measurement instrument which takes national specificities into account. It is important that the national researchers strive to achieve an optimal operationalisation of the common indicator.
- If the measurement procedure is valid for the national as well as for the international concept, then the approach is called ex-ante output harmonisation. This ideal case is rare because national indicators are not normally culture-free.
- Should a transfer from national to international categories be necessary, then it is essential that the process be documented because classification systems leave room for interpretation and classification cannot be reconstructed without documentation<sup>2</sup>.
- Examples of output harmonisation
- in official statistics (Eurostat): EU-Survey on Income and Living Conditions (EU-SILC) (European Commission, 2003; Ehling & Günther, 2003)
  - in academic social survey research: International Social Survey Programme (ISSP).<sup>3</sup>
- 11 *Input harmonisation* is normally ex-ante harmonisation. It takes as its starting point internationally-agreed standards – such as definitions, concepts, aggregations, classifications – and then uses harmonised survey methods to implement these standards. "All survey countries use precisely the same survey procedures in an ideal case. Country-specific particularities are only permissible where they are indispensable" (Information Society Technologies & CHINTEX, 1999: 1). The final international categories are defined before data collection begins.

To realise input harmonisation, a project needs a methodology group which constructs a set of key indicators for the socio-demographic/socio-economic core variables in question.

The following surveys are examples of input harmonisation:

- in official statistics (Eurostat) — European Community Household Panel (ECHP) (European Commission, 1996; European Commission/Eurostat, 2003)
- in academic social survey research — European Social Survey (ESS).

12 Harmonisation and translation techniques are often geared to specifically American research questions. However, the situation in the U.S. is rather different to that in Europe. Within the USA, harmonisation is not necessary because, although values vary across subcultures, all U.S. respondents live in the same country with the same national institutions and the same legal norms. Therefore only translation in the sense of the transfer from one language to another – usually from English to Spanish – is called for. In Europe, however, harmonisation requires more than translation because, even within the European Union, legal norms and institutions differ from country to country.

## Tested and Accepted Measurement Instruments for Cross-National Comparative Research

13 There is only a small number of tested and accepted measurement instruments for cross-national comparative research. The most well-established instruments are those developed to measure occupation:

14 In 1958, the International Labour Organisation (ILO), a specialised agency of the United Nations, introduced an International Standard Classification of Occupations (ISCO). The current instrument is ISCO-88 (ILO, 1990). A revised version is due in the course of 2008 (ILO, 2005). ISCO was developed for comparative UN statistics. The European Union's variant, ISCO-88 COM (Elias & Birch, 1994), differs only slightly from the UN version.

15 Sociologists soon began using the ISCO classification scheme as a starting point for the development of:

- a) a social prestige schema, the Standard International Occupational Prestige Scale (SIOPS) (Treiman, 1977; Ganzeboom & Treiman, 1996)
- b) a socio-economic-status index, the International Socio-Economic Index of Occupational Status (ISEI) (Ganzeboom, de Graaf, Treiman & de Leeuw, 1992; Ganzeboom & Treiman, 1996) and
- c) nominal social class categories, EGP Class Categories (Erikson, Goldthorpe & Portocarero, 1979).

16 These three ISCO-88-based indices, which are genuinely sociological instruments for comparative research, have been documented by Ganzeboom and Treiman (2003).

17 Another ILO instrument for official statistics and survey research is the International Classification of Status in Employment (ICSE-93) (Hoffmann, 2003). The ILO has also developed guidelines such as the "guideline concerning the implications of employment promotion schemes on the measurement of employment and unemployment" (ILO, 1987), and the "guideline concerning treatment in employment and unemployment statistics of persons on extended absences from work" (ILO, 1998).

18 With regard to the education variable, the following measurement instruments have been developed for use in cross-national comparative research:

- a) In 1997, the Institute for Statistics of the United Nations Educational, Scientific and Cultural Organization (UNESCO) developed an instrument for comparing education by school-leaving certificates or equivalences (general and vocational). Called the International Standard Classification of Education (ISCED-1997), it provides a minimal consensus on the definition of education (UNESCO, 1997/2003).

19 ISCED-1997 faces competition from a number of other instruments for cross-national comparative research which are based on combinations of different variables:

- b) the CASMIN (Comparative Analysis of Social Mobility in Industrial Nations) Educational Classification (Brauns, Scherer & Steinmann, 2003), an index of general and vocational education
  - c) the "Hoffmeyer-Zlotnik Educational Index" (Hoffmeyer-Zlotnik, 2003b), and the Hoffmeyer-Zlotnik/Warner Matrix of Education (Hoffmeyer-Zlotnik & Warner, 2007), an index of general and vocational education combined with the mean of occupational prestige which can be reached with a particular educational qualification
  - d) instruments based on years of schooling which ask about the highest grade of schooling attended or completed, about years spent in the educational system, or about lifetime learning.
- 20 RAMON (Eurostat, 2008), Eurostat's classifications server, provides metadata on international statistical classifications. A total of 78 different classifications (current and earlier forms of classification, not only those developed by Eurostat or other EU organisations) are documented. The ultimate and very ambitious goal of the RAMON project is to present all available information on international statistical classifications.
- 21 The information provided in RAMON for each classification identified in the database includes:
- the methodological principles applied when building the classification
  - the structure of the classification
  - its explanatory notes, if any
  - its links with other international classifications and
  - other relevant information (for instance case law).
- 22 The two best known classifications in the field of economics are:
- The Nomenclature statistique des Activités économiques dans la Communauté Européenne (NACE), the statistical classification of economic activities in the European Community. The second revision of NACE (Eurostat, 2008, classification: p. 2), implemented on 1.1.2008, has 615 classes on the fourth level and is compatible (in principle) at the two-digit level with the fourth revision of the International Standard Industrial Classification of All Economic Activities (ISIC Rev. 4), constructed by United Nations Statistics Division.
  - The Statistical Classification of Products by Activity in the European Economic Community (CPA) is the European version of the UN Statistics Division's Central Product Classification (CPC). CPA provides a common EU framework for the comparison of statistical data on goods and services and is more detailed in order to meet the specific needs of the EU. The 2002 version (Eurostat, 2008, classification: p. 2) has 2,608 sub-categories on the sixth level. The next revision of CPA is due in the course of 2008.
- 23 The Canberra Group on Household Income Statistics carries out important preparatory groundwork for the measurement of the income variable. This group was established by the UN in 1996 with the aim of improving national household income statistics and their international comparability: "The primary objective of the Canberra Group was to enhance national household income statistics by developing standards on conceptual and practical issues related to the production of income distribution statistics" (Canberra Group, 2001: xi). The Group's income concept "seeks to establish conceptual ground rules for defining and measuring household income", the way from concept to practice "provides an overview of the practical considerations which will determine the parameters for the production of a set of income distribution statistics." (Canberra Group, 2001: pp. xiii-xiv).
- 24 There are no generally accepted instruments available for any of the other socio-demographic variables, although a number of attempts have been made in this regard. For example:
- 1. the European Society for Opinion and Marketing Research (ESOMAR) developed a Standard Demographic Classification (1997)
  - 2. Eurostat established rules for harmonising socio-economic variables in EU statistics (Mejer, 2003) and

- 3. some large international comparative survey programmes have established their own methodology groups to control the quality of functional equivalence and harmonisation (e.g., the European Social Survey and the International Social Survey Programme).

25 However, because researchers often have no alternative but to use harmonisation in developing their own instruments for cross-national comparison, a set of rules is proposed below.

## Rules for Harmonisation

26 The task of harmonising socio-demographic or socio-economic variables is made easier if one abides by a small set of rules (see Hoffmeyer-Zlotnik & Wolf, 2003):

- 1. Find a common definition of what is to be measured.
- 2. Make sure that this common definition works in each of the countries surveyed.
- 3. Analyse the national concepts and structures behind the variable of interest.
- 4. Identify the similarities between the national concepts and structures underlying that variable.
- 5. Find a valid indicator or a set of indicators (depending on the variable of interest as well as on national specifics).
- 6. Decide whether the variable of interest should be measured by the same instrument in every country or culture (input harmonisation) or whether it should be measured using country or culture-specific instruments which would yield data which are harmonised after data collection (output harmonisation).
- 7. Test whether the chosen instrument reflects the empirical structures found in the different countries or cultures and whether the chosen instrument is logically related to the common definition.
- 8. Make sure that the chosen measurement instrument can be understood by the average layperson in a particular culture and can be answered correctly by all respondents regardless of national and cultural contexts.

27 These rules should help researchers conducting international comparable research to harmonise socio-demographic variables. However, practice is more complex than theory, as the following example shows.

## The Harmonisation of the Education Variable

28 When harmonising the education variable, researchers should try to follow the following set of rules.

29 *Step One - Find a common definition of education:* Of what is education an indicator? On the one hand, education is an indicator of social status. However, social status is, in turn, linked to economic status. The link between social and economic status is occupation. Education as a skill level is a prerequisite for reaching a particular job level. Strictly speaking, information on skills and knowledge is needed to identify the presence of a specific skill level required to obtain a job with a certain prestige. Tests are the instrument of choice when measuring skills and knowledge. One or two survey questions are not enough to measure them as background variables. In survey research, skill level – and education – can probably best be inferred from national diplomas, certificates and degrees which serve here as a common definition of education.

30 *Step Two - Make sure that this common definition works in each country surveyed:* In all industrial and post-industrial societies, education is a prerequisite for reaching a specific job level, and certificates are an indicator of skill level and education. Therefore, the above definition of education can be used for cross-national comparative survey research.

31 *Step Three - Analyse the national concepts and structures behind the variable of interest:* After formulating the common definition and testing its suitability, the researchers in the various national research teams have to check the concepts underlying the national educational systems. These concepts define entrance requirements for the various education levels, determine whether university entrance qualifications is reserved for a small elite or is widely accessible, etc. They also define the horizontal and vertical structure of the educational system.

32 The structure of national education is determined by the implementation of the national educational concepts, especially by:

- whether or not pre-school is compulsory
- the age at which primary education begins
- the age of transition from primary to secondary education
- the age at which the different forms of secondary education are completed
- the form in which lower secondary education is organised (one or more types of schools)
- the differentiation of lower or upper secondary education into a "tiered school system" with different parallel types of schools
- whether or not a class can be repeated
- minimum years of schooling until a basic qualification is reached
- the existence of a system of vocational education organised or supervised by the State.

33 *Step Four - Identify the similarities between the national concepts and structures underlying the variable of interest:* The educational systems of the countries of the European Union can be divided into *four different types* (Hoffmeyer-Zlotnik & Warner, 2007: pp. 120-121) which differ in several fundamental respects:

34 The *first type* is characterised by an integration of the primary and the secondary school sectors. Only tertiary education is separated. (e.g., the Scandinavian countries):

- Primary school is combined with lower secondary school to form a comprehensive school.
- The upper secondary sector has a large range of general school types, and one type of vocational school.
- The tertiary sector features a low degree of differentiation and ranges from schools providing vocational education to universities.

35 The *second type* is especially represented by a group of Western and Southern European countries. Here the primary and lower secondary branches of the educational system are integrated, and the upper secondary and tertiary sector are clearly separated, thereby making access more difficult.

- Pre-primary school, which lasts for three years, is optional. However, in France, for example, 99.9% of three-year-olds attended pre-primary school in 1998/1999 (Eurydice<sup>4</sup>, 2003: 12).
- Primary school lasts longer (duration of around 5 years).
- The lower secondary sector is one school type without differentiation.
- The upper secondary sector has a low level of vertical differentiation.
- The tertiary sector is much more differentiated. It features colleges providing vocational education, specialised universities and general universities.

36 The *third type*, found only in a small number of countries (e.g., Luxembourg and Austria), is characterised by a distinct separation of the tertiary sector from upper secondary education, which makes access more difficult. However, transition from lower to upper secondary schools is quite easy to manage:

- Primary school lasts longer (duration of around 6 years).
- The lower secondary sector features a limited number of school types and low horizontal differentiation.
- The upper secondary sector comprises different types of general and vocational schools.
- The tertiary sector ranges from schools providing academic vocational education to universities.

37 The *fourth type*, represented by a group of Central European countries (e.g., the Netherlands, Germany and the Czech Republic), is characterised by the fact that the lower secondary, the upper secondary, and the tertiary sector are clearly separated from each other:

- Primary school lasts for only 4 years.
- The lower secondary sector is much differentiated, with three or more types of schools.
- The upper secondary sector consists of one type of general school. However, it is differentiated into a large number of parallel tracks and also features different types of vocational schools.
- The tertiary sector consists of parallel colleges providing further vocational education, universities of applied sciences and a wide range of academic colleges and universities.



- 38 *Step Five - Find a valid indicator:* In the various educational systems, *four different indicators*  
to describe education can be found:
- 39 The *first indicator* is the length of time spent in the educational system. The problem here is that  
the educational system is reduced to schooling. The question asks about "years of schooling"  
or "age when leaving school".
- 40 The inference is that the longer somebody stays in the educational system, the higher the  
educational level they reach. However, if a system allows classes to be repeated when pupils  
fail to achieve a certain standard, then years of schooling is not a good indicator.
- 41 The *second indicator* – the level reached in the educational system – is more precise but it  
too is applicable only to school and college education as opposed to vocational training. The  
question asks about the highest grade or year of schooling completed. However, anchor points<sup>5</sup>  
differ across school systems. Therefore, the same grade or year of schooling can have different  
meanings in cross-national comparison.
- 42 The *third indicator* is "educational sectors". European or American educational systems can  
be divided into four educational sectors: the primary sector ending after four to six years of  
schooling, the lower secondary sector ending after eight to ten years of schooling, the upper  
secondary sector ending after eleven to thirteen years of schooling with a university entrance  
qualification or with a diploma from a vocational school or a technical college, and the tertiary  
sector ending with a university degree. For the required definition of education, these four  
categories are not precise enough.
- 43 The *fourth indicator* is "certificates". Each educational system has a series of examinations –  
from intermediate to final – for a particular level of education. And each educational system  
has differently defined points at which a student can obtain a certificate and leave the system.  
These national certificates document separate levels of education. Each educational system  
has a defined basic qualification and a university-entrance qualification. At the universities,  
we also find a basic degree (perhaps a bachelor's), a master's and a doctoral degree. These  
certificates are the anchor points which exist in every education system.
- 44 As already explained, the *fifth indicator*, skills and knowledge, is not suitable for use as a  
background variable in survey research.
- 45 What indicator is best suited when comparing education in cross-national comparative  
research?
- 46 "School-leaving age" is not a good indicator, because: (a) the age when starting primary school  
can vary between five and seven; and (b) in some educational systems pupils can repeat a class  
if their performance is below a certain level. However, the main argument against "school-  
leaving age" and "years of schooling" is the fact that the timing of anchor points such as the  
basic school-leaving qualification differ across educational systems.
- 47 The level reached in an educational system is much more precise than time spent in that system.  
However, both indicators ignore the vocational part of education. "Educational sectors"  
comprise general education as well as vocational education. From that point of view, this  
indicator is a good one. It is deemed to comply with the UN classification of standard levels of  
educational attainment. Nonetheless, the secondary sector is very complex. Without a division  
of secondary and tertiary sectors into more than two or three parts, this indicator is not very  
fruitful. Therefore in national social research in most European countries, the question asked  
relates to certificates obtained.
- 48 *Step Six - Decide between input or output harmonisation:* Above, it was pointed out that  
output harmonisation starts with a common definition of a variable representing a common  
indicator. The target variable to be surveyed is determined. The selection of the method is left  
to the participating researchers and the survey is conducted using a measurement instrument  
which takes national specificities into account. Input harmonisation takes as its starting point  
internationally-agreed standards, and then uses harmonised survey methods to implement  
these standards. Ideally, all survey countries use precisely the same survey procedures.
- 49 We have decided to measure education in terms of certificates of the national general and  
vocational educational systems, which will provide us with a comparable measurement

instrument. If the instruments presented here are employed, this would be deemed to be input harmonisation.

## Problems of Misclassification When Using the International Standard Classification of Education (ISCED 1997)

50 In the fields of official statistics and academic survey research, ISCED 1997 is a frequently-used instrument to classify education in an international comparative framework. The variables required in the present example are the levels of general and vocational education attained in the national educational system. Normally, this can be measured by national certificates. However, the ISCED classification is not easy to use. At each of the seven levels, classification is based on criteria for the definition and dimensions for the description of a specific ISCED level and programme. The ISCED levels 2, 3, and 5 are subdivided into programmes designed for direct access to a higher level (UNESCO, 1997/2003: pp. 204-216). Without specific knowledge of the national educational systems and without a basic understanding of the ISCED classification in national contexts, researchers produce misclassifications because of the complex constructs and combinations at each level.

**Table 1: ESS Round 1-data for four countries classified in accordance with ISCED by the national ESS research group (columns a) and Eurostat (columns b)**

Country (in % of respondents)		A		DK		E		F	
ISCED		a	b	a	b	a	b	a	b
0	pre-primary	02	00	00	01	18	02	09	01
1	primary	00	00	01	00	18	31	16	18
2	lower secondary	29	23	23	19	21	25	26	19
3	upper secondary	34	51	47	51	21	19	05	40
4	post-secondary non-tertiary	23	09	11	00	08	00	17	00
5	first stage of tertiary	00	16	17	28	14	23	11	21
6	second stage of tertiary	12	00	01	00	00	00	15	00

Source: Data from European Social Survey (ESS), Round 1, for Austria (A), Denmark (DK), Spain (E), and France (F). Respondents were aged 15 years and older.

51 As can be seen in Table 1, European Social Survey national research groups use different definitions for classification than Eurostat, the official statistical office for all countries of the European Union. While the (a) columns show classification done by the national research groups, the (b) columns feature classification according to Eurostat's definition of the categories. European Social Survey respondents are persons aged 15 and older. ISCED category 0 applies to persons who have pre-primary education only. This is very rare in Western European countries. Is it plausible that 18% of all Spanish and 9% of all French respondents (aged 15 and older) belong to that group? What happened here is that the research groups placed persons who had not finished general education by the age of 15 and older in this category. These persons were actually attending lower secondary school. In Spain, respondents who had finished primary school were also placed in this category. Apparently, the research groups also had problems defining the transition from lower secondary to upper secondary – see Austria (29 : 23), Denmark (23 : 19) and France (26 : 19) where the research groups found more respondents who had completed lower secondary level than Eurostat.

52 ISCED Levels 4 and 6 also give rise to misclassifications. Level 4, "post-secondary non-tertiary education", covers a small group of persons who finish upper secondary school without attending a college or university in the tertiary sector. This group includes persons doing voluntary service or practical training before attending university and the small group of master craftsmen and women. That 23% of the Austrian respondents and 17% of French respondents belong to this category is an obvious misclassification. Based on Eurostat's definition of Level 4, 9% of Austrian respondents were assigned to this group, whereas in France, Denmark and Spain, the figure was 0%. ISCED Level 6 covers only those persons who have obtained at least

a doctorate. That 12% of the Austrian respondents and 15% of the French attained this level is unrealistic. The Austrian ESS research group obviously assigned all university graduates regardless of degree type to Level 6 and the French ESS researchers appear to have included master's degree holders in Level 6 rather than Level 5.

53 However, not only social research groups have difficulties with ISCED classification. In the past, even Eurostat had problems with the correct classification of persons belonging to ISCED Level 4, "post-secondary non-tertiary education": in the classification for Germany presented by Eurydice for 2001/2002 (Eurydice, 2003), ISCED Level 4 was left out altogether. However, in the 2002/2003 version, ISCED Level 4 was included (Eurydice, 2005).

54 As can be seen from these misclassification problems, a measurement instrument is needed which is easier to use and which more accurately reflects the empirical structures found in the different countries. With this in mind, Hoffmeyer-Zlotnik and Warner developed a matrix of education (Hoffmeyer-Zlotnik & Warner, 2005; 2007).

## The Hoffmeyer-Zlotnik/Warner Matrix of Education

55 The Hoffmeyer-Zlotnik/Warner (HZ/W) Matrix of Education (Hoffmeyer-Zlotnik & Warner, 2007) is based on the answers to questions in national questionnaires about the highest general educational level attained and the highest educational qualification obtained by the respondent. Therefore – as rule seven above requires – the chosen instrument reflects the empirical structures found in the various countries or cultures and is logically related to the common definition.

57 In the matrix, the decisive factor is the labour-market positions obtainable with a particular qualification. For comparison purposes within Europe (Bologna Process countries<sup>6</sup>), the matrix offers three anchor points common to each country: the sanctioned end of basic education, university entrance, and university graduation. The individual qualification level of a person is identified by a weighted numeric value between 1 and 10. A score of 1 means that only unskilled positions can be obtained on the labour market whereas a score of 10 means that a person has graduated from university and has a realistic chance of obtaining a high-prestige job.

58 The HZ/W-matrix has two axes: "general education" and "vocational/higher education" including university degrees. All possible qualifications in the national education system are rank ordered from "none" (failure to obtain a basic school-leaving qualification), which carries a score of 1, to "university" with a score of 10 (see Table 2).

**Table 2: The Hoffmeyer-Zlotnik/Warner Matrix of Education**

vocational/higher education	ISCED major groups	general education levels attained				
		none	basic level	lower secondary level	upper secondary level	university-entrance level
none	9,8	1	2	3	6	7
dual system*	8,7	4	4	5	5	5
vocational school	4,5	4	4	5	5	5
vocational college	3,4	0	5	5	8	8
college of higher education	2,3	0	0	9	9	9
university	2	0	0	0	10	10

\* Called the dual system because training is carried out at two places of learning: the workplace and in a vocational school.

Source: Hoffmeyer-Zlotnik & Warner 2007: 138

59 In the EU member countries, the hierarchy of general education is determined by levels of schooling. These levels are based on the standard statutory periods required to obtain the various school-leaving certificates which range from a basic qualification to a university entrance qualification. Although the basic qualification reached after class 9 is significantly lower than a basic qualification obtained after class 10, every system features such a qualification as the first recognised diploma that permits the holder to enter the labour force

with a chance of getting a job. University entrance qualifications are recognised across all educational systems and in all countries of the European Union. In all countries, these certificates are obtained by the end of the upper-secondary phase and are normally granted after class 12 or 13. A university entrance entitlement can also be acquired by combining qualifications obtained in general and vocational education. The university has the same status in all EU countries, and the Bologna declaration, which was signed in 1999, has led to greater comparability and compatibility of academic degree and quality assurance standards in Europe.

60 The rank order for vocational and higher education is determined by the major groups used in the International Standard Classification of Occupations (ISCO-88) because, as a background variable in a social survey, we cannot measure skills by tests of competence or occupational capacities. The conceptual frameworks of these major groups are skills and the kind of work performed. The ISCO uses skill levels as a criterion to structure the occupation classification, defining skills as "the ability to carry out the tasks and duties of a given job" (ILO, 1990: 2). ISCO Major group 2 professions are those where an academic qualification is obligatory. Technicians are classified in Major group 3; Major group 4 professions are clerks; service workers or salespersons are in Major group 5; Major group 7 comprises craft and trade workers, and Major group 8 plant and machine operators. The occupations classified in Major group 9 are those where no formal qualification is necessary. This category comprises low and unskilled labour.

61 Our own tests with ESS data show that the correlation between the HZ/W Matrix of Education and ISCED 1997 is very high. One country representing each of the four different types of educational systems was analysed comparing the HZ/W Matrix with ISCED. In the case of Denmark, as an example of Type one, the correlation between HZ/W and ISCED was .96; in the case of France, as an example of type two, the correlation was .95. The correlation for Luxembourg, as an example for type three, was .94; and for Germany, as an example of type four, it was .83 (Hoffmeyer-Zlotnik & Warner, 2007: 144).

## Conclusion

62 Rule eight above requires that the chosen measurement instrument be understood by the average layperson and that it be possible for all respondents, regardless of class or culture, to answer survey questions correctly.

63 This requirement is fulfilled by using national certificates to measure education. Respondents who have attended educational institutions are familiar with their national educational system. And even those respondents who had to accumulate certificates in order to reach a particular level of education (e.g., university entrance), rather than attaining that level directly, are aware of what the equivalent of their final qualification is. Therefore a questionnaire asking about familiar categories such as certificates produces more valid replies than a questionnaire which uses abstract categories like "lower-secondary" or "post-secondary non-tertiary".

64 According to rule two above, after researchers involved in comparative research have determined what they want to measure, they must analyse the national concepts and structures behind the target variable. They then have to find the common elements and develop a typology of the variable with all the elements which they need to differentiate between the different types. After this analytical work has been done, researchers can look for a suitable measurement instrument. The best solution is to choose an existing instrument, ideally one normally used in national questionnaires. However, if there is no suitable instrument available, they must construct one.

65 As can be seen from the example of how to measure education, existing instruments are sometimes difficult to use. ISCED 1997 is a generalised model of education on an abstract level. For most modern industrialised countries, it is a useful instrument for classifying education, but it does not provide instructions on how to classify national educational categories in international terms. Accordingly, the risk of error is very high. This is evidenced by the doubtful nature of many of the classifications produced – but often not adequately documented – by the various national and international research groups. In countries, which

have complex educational systems, the ISCED 1997 categories do not adequately cover the educational situation of the population entering the labour market. Furthermore, ISCED features categories which are not compatible with those in many national educational systems. As a result, respondents are often not familiar with the categories used in ISCED-based national survey questionnaires. In effect, therefore, it is the respondents who are saddled with the task of harmonisation. In other words: the ISCED 1997 categories perhaps can be understood by experts, but not by respondents.

66 By contrast, the HZ/W Matrix of Education is like a guide to classifying national educational categories. It shows that it is possible to construct an instrument which surveys in terms of national categories, inserting these categories in a matrix. The matrix has to be modified for the four types of educational system characterised in above because, on the "general education" axis, not all systems feature four levels from "basic" to "university entrance". Hence we have four matrices, one for each type of educational system. However, any research assistant can insert the respective national categories into the matrix so that the risk of misclassification is almost ruled out.

67 Harmonising demographic and socio-economic variables is a challenging task. The harmonisation of the education variable using the method presented here provides a useful illustration of what researchers should bear in mind when carrying it out.

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## Notes

1 European Social Survey (ESS) <http://www.europeansocialsurvey.org/> (02-25-2008)

2 The transfer from national German education categories to the international ISCED 1997 system (UNESCO, 1997/2003) illustrates the subjective nature of classification. Whereas in its 2001 version, Eurydice (European Commission, 2002) did not classify any cases in the category "post secondary non-tertiary", I allocated to this category all persons whose highest level of educational achievement was master craftsperson and those who attended compulsory practical training or did an obligatory internship (e.g., as trainee journalist) after obtaining their university entrance qualification but before entering higher education.

3 International Social Survey Programme (ISSP). <http://www.issp.org/> (02-25-2008)

4 <http://www.eurydice.org/> (02-25-2008)

5 Every school system has "anchor points" such as school-enrolment age, the sanctioned end of basic education (in some countries at the end of Grade 9, in others after Grade 10), university entrance and university graduation.

6 See "The Bologna Process - Towards the European Higher Education Area", [http://ec.europa.eu/education/policies/educ/bologna/bologna\\_en.html](http://ec.europa.eu/education/policies/educ/bologna/bologna_en.html)

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***Résumés***

Harmonisation des variables démographiques et socio-économiques dans la recherche par enquêtes transnationales: L'objectif de cet article est de démontrer comment les variables démographiques et socio-économiques dans les enquêtes transnationales peuvent être harmonisées. Après une courte introduction sur la différence entre traduction et harmonisation, on montre le développement qui s'opère entre des conceptions et des structures qui s'élaborent au niveau national jusqu'à des instruments de mesure qui soient valable à un niveau international, en utilisant l'exemple des variables éducatives.

The aim of the present paper is to demonstrate how demographic and socio-economic variables in cross-national comparative survey research can be harmonised. After a short introduction discussing the difference between translation and harmonisation, the path from a national concept and structure to an internationally-applicable measurement instrument is traced using the education variable as an example.

***Entrées d'index***

***Mots clés*** : Enquêtes transnationales, Harmonisation des variables, Variables éducatives

***Mots clés*** : Cross-national Surveys, Education Variables, Harmonisation of Variables