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# NEPS Technical Report: Implementation of the ISCED-97, CASMIN and Years of Education Classification Schemes in SUF Starting Cohort 3

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# LIfBi

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**NEPS Technical Report: Implementation of the ISCED-97, CASMIN and**

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## 1    Introduction

Bearing in mind the variety of utilized questions and possible answers on (in)completed school and vocational episodes, three main educational classification schemes were used to harmonize the given responses and facilitate standard analyses of starting cohort 3: Firstly, the International Standard Classification of Education in its version of 1997 (ISCED-97)[1], secondly, the Comparative Analysis of Social Mobility in Industrial Nations (CASMIN)[2][3] and, thirdly, the years of education. In doing so, each classification scheme was generated on the one hand for the interviewed parental units of the target persons and, if present and stated, on the other hand for their respective partners. For replicability reasons, a comprehensive overview as well as a step by step description of the underlying derivation processes is given in the following lines.

## 2    Data source, variables and the general integration process

To obtain the ISCED-97, CASMIN and years of education scale scores, information from the pParent data source were used. For both the interviewed parental units and their partners, two auxiliary variables holding the general school (parental unit (pu): p731802, p731807; partner (p): p731852, p731857) and four variables, providing vocational information (pu: p731813, p731818, p731820, p731821; p: p731863, p731868, p731870, p731871) were applied to gain the highest school-leaving qualification and last vocational degree in an already ISCED-97 or CASMIN specific categorization. Subsequently, the data matrix was sorted by parental / partner ID and wave and the auxiliary variables were carried forward in time within each parental unit or partner to fill potential missing information due to the questionnaire design[1]. The resulting data were checked for consistency. All this was necessary for the last step, the line by line combination of the auxiliary variables on highest school-leaving and last vocational qualifications to derive the final and last valid ISCED-97 or CASMIN scale scores.

See below for a simplified screenshot example on the resulting ISCED-97 scores (p731802_g1)):

| ID_t | wave | p731802 | p731813 | p731802_g1 |
|---|---|---|---|---|
| 4006250 | 2010 | General / subject-spec... | Vocational qualificati... | [4A] Full maturity cer... |
| 4006250 | 2011 | . | Vocational qualificati... | [4A] Full maturity cer... |
| 4006250 | 2012 | . | . | [4A] Full maturity cer... |

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[1] This step was necessary because the highest school-leaving qualification was asked only when a parental unit was surveyed for the first time, no prior schooling information was given, or, for the partners, in case of an occurring partner change. The same applies to the last vocational degree, which was updated only when a vocational change was stated explicitly in a corresponding filter question (cf. appendix). The final scores therefore represent the last known combined information and are also provided and filled in waves where no (new) information was asked.

## 3   ISCED-97 classification (p731802_g1, p731852_g1)

On a variable level, ISCED-97 was built in this last step on the following combination of categories: Beginning with the two variables for the highest school-leaving qualification, parental units and partners with another type of school-leaving qualification or a residual value (pu: p731802 = -98, -97, 7, p731807 = -98, -97, 7; p: p731852 = -98, -97, 7, p731857 = -98, -97, 7) were initially treated as not determinable ("-55"), occurring missings by design (pu: p731802 = -54, p731807 = -54; p: p731852 = -54, p731857 = -54) equally worded ("-54"). Concerning determinable statements, no school-leaving qualification or one from a special needs school (pu: p731802 = -20, 6, p731807 = -20, 6; p: p731852 = -20, 6, p731857 = -20, 6) were classified into ISCED-97 "0A/1A/1B". Parental units and partners with a basic or qualifying school-leaving qualification were categorized into "2B" (pu: p731802 = 1, 2, p731807 = 1, 2; p: p731852 = 1, 2, p731857 = 1, 2), those with an intermediate secondary school-leaving qualification into "2A" (pu: p731802 = 3, p731807 = 3; p: p731852 = 3, p731857 = 3), and those with an entrance certificate for a university of applied science or a university into "3A" (pu: p731802 = 4, 5, p731807 = 4, 5; p: p731852 = 4, 5, p731857 = 4, 5). Remaining cases were treated as a system-missing value.

For the two variables on the last vocational degree, parental units and partners with another type of vocational qualification or a residual value (pu: p731813 = -98, -97, 21, p731813 = 3 & p731821 ≠ 1, 2, 3, 4; p: p731863 = -98, -97, 21, p731863 = 3 & p731871 ≠ 1, 2, 3, 4) were treated once again as not determinable ("-55") and missings by design (pu: p731813 = -54; p: p731863 = -54) in equal measure ("-54"). Then, those with no vocational degree (pu: p731813 = -20; p: p731863 = -20) were coded to "0" ("no degree"). A vocational qualification with a journeyperson's or assistant's certificate, dual vocational education and training, semi-skilled vocational training with a company, as a semi-skilled worker in the former German Democratic Republic or for an ordinary rank within the civil service (pu: p731813 = 1, 17, 19, p731821 = 1; p: p731863 = 1, 17, 19, p731871 = 1) were classified into "3B". A vocational degree for a middle rank within the civil service (pu: p731821 = 2; p: p731871 = 2) was categorized into „3C". „5B" was assigned to those with a certificate as Master or Technician, from a school for health care professionals, a "Berufsfachschule" or commercial school, a "Fachschule", a "Berufsakademie", a college of public administration or for a higher rank within the civil service (pu: p731813 = 2, 4, 5, 6, 7, 12, 13, p731813 = 8, 9, 10, 16 & p731818 = -98, -97, 1, 2, 5, p731821 = 3; p: p731863 = 2, 4, 5, 6, 7, 12, 13, p731863 = 8, 9, 10, 16 & p731868 = -98, -97, 1, 2, 5, p731871 = 3). Finally, parental units and partners with a qualification for a senior rank within the civil service, with a degree from a university of applied science or a university (pu: p731813= 14, 15, p731813= 8, 9, 10, 16 & p731818 ≠ -98, -97, 1, 2, 5, p731821 = 4; p: p731863= 14, 15, p731863= 8, 9, 10, 16 & p731868 ≠ -98, -97, 1, 2, 5, p731871 = 4) were coded to "5A", those with an additional

doctorate or habilitation (pu: p731813 = 11, p731820 = 1; p: p731863 = 11, p731870 = 1) into "6". Remaining cases were treated again as system-missing.

Bringing together the codings, only the resulting maximum ISCED-97 scale scores of the two auxiliary variables within each line or point in time were considered. Hence, for example, parental units or partners with a "not determinable" school-leaving qualification and no further vocational degree were categorized into "0A/1A/1B", while those with the same vocational information and a school-leaving qualification, leading to "2B", "2A" or "3A", were classified within the final ISCED-97 scale to the latter[2]. Furthermore, considering second cycles, in the presence of the combination "3A" as highest school-leaving qualification and "3B" as last vocational degree "4A" was given to the concerning subjects (cf. Table 1).[3]

## 4   CASMIN classification (p731802_g2, p731852_g2)

The derivation processes of the CASMIN scale scores were similar to the steps leading to the ISCED-97 classification introduced above. They started by generating two auxiliary variables for the highest school-leaving and last vocational qualification, and subsequently, obtaining the CASMIN scale scores by combining them. Considering a relationship between the ISCED-97 and CASMIN classification, it was possible to use the auxiliary variables of the former as a starting point for the corresponding ones of the latter, supplemented by some CASMIN specific modifications. Here, it was feasible to use the corresponding ISCED-97 auxiliary variables for the highest school-leaving qualification without any further modifications as CASMIN ones. Then, for the corresponding CASMIN auxiliary variables that indicate the last vocational degree, it was possible to keep the information not determinable, missing by design and no vocational qualification. Furthermore, parental units and partners with an ISCED-97 of "3B", "3C" and "5B" were summarized into only one new category, containing those with a vocation-specific schooling or training. Indeed, it was not practicable to use the given information to identify subjects with a vocational degree from a university of applied science or a university. Here, it was necessary to generate two new categories, consisting of those with either a degree from a university of applied science (pu: p731813= 14, p731813= 8, 9, 10, 11, 12, 13, 16 & p731818 = 3, p731813 = 3 & p731818 = 3; p: p731863= 14, p731863= 8, 9, 10, 11, 12, 13, 16 & p731868 = 3, p731863 = 3 & p731868 = 3) or a university (pu: p731813 = 15, p731813 = 8, 9, 10, 11, 12, 13, 16 & p731818 = 4, p731813 = 8, 9, 10, 11, 16 & p731818 = ., p731813 = 3 & p731818 = 4, p731820 = 1,

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[2] Another example would be, if a person's information on the highest school-leaving qualification is missing or not codable, but the respondent indicates to have a university degree as a further vocational qualification. Here, ISCED-97 was coded "5A". This assumes the fact, that the person must have had any type of entrance qualification when starting university studies.

[3] Information on the temporal order of events was not available for parental units and partners, because only the highest degree was collected. Therefore no further differentiation between second cycles "4A" and "4B" was possible and "4A" was used as a reference.

p731821 = 4; p: p731863 = 15, p731863 = 8, 9, 10, 11, 12, 13, 16 & p731868 = 4, p731863 = 8, 9, 10, 11, 16 & p731868 = ., p731863 = 3 & p731868 = 4, p731870 = 1, p731871 = 4). Remaining cases were treated again as system-missing values. The final CASMIN scale scores were derived afterwards through the combinations shown in table 2.

## 5 Years of education classification (p731802_g3, p731852_g3)

Completing the harmonization process, the years of education were gained from the given data. For this purpose a function based on the CASMIN classification scheme was employed to maintain the corresponding scale scores for the respective subjects. Generally, drawing from the categories of the CASMIN scheme, "1a" was assigned to -20 (a specific missing meaning "no degree")[4], "1b" to 9, "1c" to 12, "2b" to 10, "2a" and "2c_gen" to 13, "2c_voc" to 15, "3a" to 16 and "3b" to 18 years of education. Finally, parental units and partners with no codable information, a missing or a missing by design, CASMIN scale score were treated exactly the same within the years of education scheme.

### References

[1] United Nations Educational, Scientific and Cultural Organization (1997): International Standard Classification of Education ISCED 1997. http://www.uis.unesco.org/Library/Documents/isced97-en.pdf [08.07.2015].
[2] König, Wolfgang/ Lüttinger, Paul/ Müller, Walter (1988): A Comparative Analysis of the Development and Structure of Educational Systems. Methodological Foundations and the Construction of a Comparative Educational Scale. CASMIN-Working Paper No. 12.
[3] Lechert/ Yvonne/ Schroedter, Julia/ Lüttinger, Paul (2006): Die Umsetzung der Bildungsklassifikation CASMIN für die Volkszählung 1970, die Mikrozensus-Zusatzerhebung 1971 und die Mikrozensen 1976-2004. ZUMA-Methodenbericht 2006/12.

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[4] This is a deviation from former editions and versions of this variable in older releases, where a value of 8 years was assumed as a kind of „best guess" for cases with „no degree" according to CASMIN. We believe this guessing should be done by the user, since the assumptions may be less valid for specific populations and sets of analyses (e.g. migrants) and we intent to highlight this necessity using the new missing code „-20" instead.

**Table 1: ISCED-97 Parent and Partner[5]**

| | | Vocational qualification | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Missing | Not determinable | No qualification (0A/1A/1B) | Ordinary civil service, Assistant's certificate (3B) | Middle civil service (3C) | Higher civil service, Technician, Master, … (5B) | Senior civil service, University (of applied science), … (5A) | Doctorate, Habilitation (6) |
| School-leaving qualification | Missing | Missing | -55 | 0A/1A | 3B | 3C | 5B | 5A | 6 |
| | Not determinable | -55 | -55 | 0A/1A | 3B | 3C | 5B | 5A | 6 |
| | No qualification, Special needs school (0A/1B) | 0A/1A | 0A/1A | 0A/1A | 3B | 3C | 5B | 5A | 6 |
| | „Hauptschule" (2B) | 2B | 2B | 2B | 3B | 3C | 5B | 5A | 6 |
| | Intermediate secondary school (2A) | 2A | 2A | 2A | 3B | 3C | 5B | 5A | 6 |
| | Entrance certificate university (of applied science) (3A) | 3A | 3A | 3A | 4A | 3C | 5B | 5A | 6 |

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[5] Missings by design „-54" can occur – by design – only simultaneously and the resulting score is, of course, also „-54" – missing by design; for simplicity this line and row was left out of the table.

**Table 2: CASMIN Parent and Partner[6]**

| | | Vocational qualification | | | | | |
|---|---|---|---|---|---|---|---|
| | | Missing | Not determinable | No vocational qualification | Vocational specific schooling | University of applied science | University |
| School-leaving qualification | Missing | Missing | -55 | 1a | 1c | 3a | 3b |
| | Not determinable | -55 | -55 | 1a | 1c | 3a | 3b |
| | No qualification, Special needs school | 1a | 1a | 1a | 1c | 3a | 3b |
| | „Hauptschule" | 1b | 1b | 1b | 1c | 3a | 3b |
| | Intermediate secondary school | 2b | 2b | 2b | 2a | 3a | 3b |
| | Entrance certificate university (of applied science) | 2c_gen | 2c_gen | 2c_gen | 2c_voc | 3a | 3b |

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[6] Missings by design „-54" can occur – by design – only simultaneously and the resulting score is, of course, also „-54" – missing by design; for simplicity this line and row was left out of the table.

## Appendix

### Figure 1: Filter question for routing respondent types within education instrument

| 63905 | [AUTO]: Help variable: control training module respondent | |
|---|---|---|
| First-time interviewee or panel participant without any information on training [1] | | ☐ |
| Panel participant with information on general training but without any information on professional training [2] | | ☐ |
| Panel participant without information on general training but with information on professional training [3] | | ☐ |
| Panel participant with information on both [4] | | ☐ |

if (63905 = 1, 3) goto 63104
if (63905 = 2) goto 63112
if (63905 = 4) goto 63117

autoif (first-time interviewees = 1) 63905 = 1.
autoif (first-time interviewees = 2) & (63902 = 2) & (63904 = 2) 63905 = 1.
autoif (first-time interviewees = 2) & (63902 = 1) & (63904 = 2) 63905 = 2.
autoif (first-time interviewees = 2) & (63902 = 2) & (63904 = 1) 63905 = 3.
autoif (first-time interviewees = 2) & (63902 = 1) & (63904 = 1) 63905 = 4.

| Variables | | |
|---|---|---|
| (S3SHB_hilf) | Help variable: control training module respondent | |

Source: Starting Cohort 3: Grade 5 (SC3). Wave 2. Questionnaires (SUF-Version). Leibniz Institute for Educational Trajectories.

### Figure 2: Filter question for updating the last vocational degree

| Condition: if (63903 <>2) | | |
|---|---|---|
| 63117 | Now we would like to know what has changed since our last interview. Since our last interview in <01909/01907>, have you obtained a further professional training qualification? | |
| Condition: if (63903 = 2) | | |
| 63117 | Now we would like to know what has changed since our last interview. Since our last interview in <01909/01970> have you obtained a professional training qualification? | |
| Yes [1] | | ☐ |
| No [2] | | ☐ |
| Refused [-97] | | ☐ |
| Don't know [-98] | | ☐ |

if (63117 = 1) goto 63118
if (63117 = 2, -97, -98) goto 63127Z

| Variables | | |
|---|---|---|
| (S3SHB2up1) | Update respondent's professional qualifications | |

Source: Starting Cohort 3: Grade 5 (SC3). Wave 2. Questionnaires (SUF-Version). Leibniz Institute for Educational Trajectories.