Assignment of ISCO 2008 to micro-classes.

We sought to replicate the micro-class schema using ISCO08 Codes and implement it in large cross-national datasets such as the ESS, ISSP and EVS. The micro-class approach groups occupations with similar educational backgrounds, credentialing, occupational tasks and working environments. These factors create social closure around occupations and socialize the incumbents (Grusky, Wedeen, and Sorensen 2000; Weeden and Grusky 2005).

In the absence of data on social closure mechanisms we rely on occupational titles and descriptions from official ISCO08 documentation. A common strategy is to collapse the ISCO to its 130 3-digit codes. We go one step further and examine to what extent three-digit codes resemble other micro-class schema and to what extent these can be further (dis)aggregated. We compared three digit codes to previous micro-class cross walks from the US occupational codes (OCC50 and OCC70) provided by Kim Weeden (personal website) and appendixes from journal articles on micro-class (Jarvis and Song 2017; Jonsson et al. 2009; Song et al. 2020). However, these sources do not provide a standardized set of micro-classes. Each author adapts the micro-classes to their data and aims. This practice may limit comparability across studies but fits the conceptualization of stratification underlying the micro-class approach. That is, occupational closure which varies across time and countries.

We primarily emulated the micro-class titles based on Jonsson et al. 2009 because we sought a cross-national micro-class schema. We started by categorizing the 3-digit ISCO08 codes into micro-classes using the categories in Jonsson et al. 2009. However, we found these categories would be too large and heterogenous, thereby violating the spirit of the micro-class approach. Our data covers a different period than that of the Jonsson et al. 2009 paper, namely the post-industrial era rather than the industrial era. Post-industrialization is marked by occupational upgrading in most countries (Fernández-Macías and Hurley 2016; Oesch 2006; Oesch and Menés 2011), meaning an expansion and further differentiation in managerial and professional occupations. Additionally, industrial “blue-collar” occupations are replaced by “pink-collar” occupations in the personal services sector (Hertel 2017). These changes are reflected in the ISCO08 coding scheme if compared to its predecessor ISCO88: the former classification contains fewer industrial occupations while adding further distinction within managerial, professional, and service sector occupations. We therefore did not simply code ISCO08 codes into the categories from Jonsson et al. 2009 but rather refined our micro-classes through the following two step process. In phase 1, coder 1 started with an initial assignment based on transparent allocation rules. In phase 2, coders 2 and 3 checked the assignment based on external information regarding the occupational tasks matching the ISCO labels. Phase two consisted of two rounds of checks and written discussions about differences in assignment strategies. Finally, the remaining open cases were unanimously assigned after a final face-to-face deliberation of all three coders. We proceeded in detail as follows:

1. Coder 1 took ESS data from Round 3 to Round 9 and grouped similar 3-digit codes using the following rules:
    a. 3-digit ISCO classifications with less than 100 respondents are collapsed with an adjacent occupation. If there were other 3-digit occupations with similar tasks, working conditions and site of production then the sparse 3-digit codes were merged with a similar and more numerous one. If there were no other 3-digit codes that could be combined with the sparse 3-digit code, then these were aggregated to

the "Not Elsewhere Classified" (NEC) micro-class of their 3-digit level or, if not available in their 2-digit level.
   b. Any 3-digit ISCO code with at least 1% of valid cases is its own micro-class.
   c. 3-digit ISCO codes were collapsed based on the industry, educational pathways, and site of production. The Jonsson et al 2009 paper was used as a guideline for the micro-class labels and relevant distinctions. The OCC50 and OCC70 to micro-class assignment were consulted when micro-class titles were ambiguous on the contents of specific micro-classes and as a guideline to aggregate 3-digit ISCO codes.
2. Coder 2 provided feedback on the coding and suggested several improvements including splitting up micro-classes or combining different micro-classes and pointed out inconsistencies based on 4-digit codes.
3. Coder 1 then re-examined the coding and implemented any changes agreed upon.
4. Coder 3 provided feedback and suggested improvements.
5. Any discrepancies and disagreements between coders were discussed and the final micro-class assignment specified.
6. We examined the homogeneity of the micro-classes by the median educational attainment and income decile of the occupation.

Improvements and suggestions made in step 2 consisted of identifying 4-digit codes which could be separated from their 3-digit micro-class and aggregating occupations that were separated by the 1% rule with other similar occupations. Step 3 disaggregated several micro-classes in the managerial occupations and made further improvements to the assignments of 4-digit ISCO codes to micro-classes among professionals. For example, the professional NEC category was divided into "creative professions" and "social science professionals". The micro-class "Business and administration associate professionals NEC" was disaggregated to "Regulatory government associate professionals" and "creative professionals". The changes can be observed in "isco08_to_micro08_v1". ISCO codes in red were advised by Coder 2 in step 2 and ISCO codes in yellow were changes made by coder 1 in step 3.

In step 4 and 5 the disaggregated micro-classes in the professional, associate professional and skilled manual occupations was further sharpened by examining the internal homogeneity and assessing to what extent micro-classes could be separated. The main changes in this step were the aggregation of the 6000 occupations into two micro-classes (instead of three), the disaggregation of major group 7 and 8 by their industry or material handled. For example, occupations working with textile from major group 7 and 8 were combined and the Drivers and mobile plant operators were disaggregated to three micro-classes. At major level 3, the sports and fitness workers were moved from creative professionals to social and cultural and related associate professionals NEC. The final version of the isco08 to micro class schema can be found in the file "isco08 to micro v2.1".

Our micro-class schema includes 78 categories reduced from the 130 minor groups (3-digit) and 436-unit groups (4-digit) in the ISCO08.

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