

Chapter 2

How Do We Assess Civic Attitudes Toward Equal Rights? Data and Methodology



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Abstract Analyzing tolerance in youth may help educators to identify strategies to promote tolerance. This chapter describes the IEA's International Civic and Citizenship Education Study (ICCS) 2009, outlining the main objectives of the survey and the assessment design. Specific variables were selected from the ICCS data for the five empirical studies in this report. After assessing the variables used in the different chapters, the methodological features common to the different analytical chapters of this book are discussed in greater detail.

Keywords International Civic and Citizenship Education Study (ICCS) International large-scale assessments • Measurement invariance Multi-group confirmatory factor analysis • Multi-level models

2.1 The International Civic and Citizenship Education Study 2009 Data

The International Civic and Citizenship Education Study (ICCS) 2009 conducted by the International Association for the Evaluation of Educational Achievement (IEA) was the principal data source for all the research chapters in this report (Bresé et al. 2011). The 2009 study investigated the ways in which lower-secondary school

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students (mainly in grade 8¹) were prepared to undertake their roles as citizens (Schulz et al. 2010). Students completed a knowledge test and a questionnaire inquiring into attitudes and background information. Additionally, ICCS also included a set of instruments designed to gather information from and about teachers, schools and education systems: a teacher questionnaire completed by the teachers themselves, a school questionnaire completed by school principals and a national context survey completed by the national research coordinators.

The samples in each country were designed as two-stage cluster samples. In the first stage probability proportional to size (PPS) procedures were used to select schools within each country. In the second stage, within each sampled school, an intact class from the target grade was selected at random, with all the students in this class participating in the study. Therefore, for each participating country, the ICCS 2009 data have a multilevel structure (Snijders and Bosker 2011) with students nested within classes/schools. The surveyed students are representative samples of the population of grade 8 students in each country. Each national sample satisfying the participation standards set by the IEA was equally weighted (Schulz et al. 2011).

In this report, we use data from all 38 countries that participated in the study (see Table 2.1 for the school sample sizes in each country).

2.2 Variables

This section presents a brief description of the dependent and independent variables used in the analyses. Details about the operationalization of concepts and construction of variables are presented in each of the analytical chapters.

2.2.1 *Dependent Variables*

As already mentioned in this volume, we operationalize the outcome variables in terms of support for equal rights for three different social groups: immigrants, ethnic groups and women. To do so, we use confirmatory factor analysis (CFA) to construct measures based on three scales originally included in the ICCS 2009 database: student attitudes toward equal rights for immigrants (IMMRGHT), student attitudes toward equal rights for all ethnic/racial groups (ETHRGHT), and student attitudes toward gender equality (GENEQL). We modified the original scales for two main reasons: to ensure a better fit with our conceptual framework

¹ICCS assesses students enrolled in the eighth grade, provided that the average age of students at this year level is 13.5 years or above. In countries where the average age of students in Grade 8 is less than 13.5 years, Grade 9 is defined as the target population.

Table 2.1 Student numbers and school sample sizes for countries participating in ICCS 2009

Country	Total number of schools	Total number of students
Austria	135	3385
Belgium (Flemish)	151	2968
Bulgaria	158	3257
Chile	177	5192
Chinese Taipei	150	5167
Colombia	196	6204
Cyprus	68	3194
Czech Republic	144	4630
Denmark	193	4508
Dominican Republic	145	4589
England	124	2916
Estonia	140	2743
Finland	176	3307
Greece	153	3153
Guatemala	145	4002
Hong Kong, SAR	76	2902
Indonesia	142	5068
Ireland	144	3355
Italy	172	3366
Korea	150	5254
Latvia	150	2761
Liechtenstein	9	357
Lithuania	199	3902
Luxembourg	31	4852
Malta	55	2143
Mexico	215	6576
Netherlands	67	1964
New Zealand	146	3979
Norway	129	3013
Paraguay	149	3399
Poland	150	3249
Russia	210	4295
Slovakia	138	2970
Slovenia	163	3070
Spain	148	3309
Sweden	166	3464
Switzerland	156	2924
Thailand	149	5263

Source Schulz et al. (2010)

and to ensure that the scales were comparable across countries. Detailed information about the procedures followed to construct these scales and to test their measurement invariance can be found in Chap. 3.

2.2.2 *Independent Variables*

Each of the contributions in this volume acknowledges that there are multiple and complex hierarchical layers of explanatory mechanisms that could be influencing student attitudes toward equal rights for different social groups (see Chap. 1 in this volume). For this reason, according to the specific objectives and conceptual frameworks used in each of the chapters, the independent or explanatory variables used in this volume are selected from the three available background questionnaires in the ICCS database (the student, teacher and school questionnaires). In addition, in some of the chapters that follow, the researchers created new variables derived from the variables originally included in the database (for example, measures of school average socioeconomic background, and the level of immigrant student segregation; see later for full details) and included information from external sources (such as measures of statistical dispersion intended to represent the income or wealth distribution of a nation's residents). A detailed description of all the independent variables used in the analyses contained in this volume is included in each of the analytical chapters.

2.3 Analytical Strategy

This section describes the methodological features common to the different analytical chapters included in this report. Two main points are central to the analytical strategy used in this volume. The first one is that all the analyses included here are comparative in nature, and the second is that the data used for the analyses are characterized by having a nested or hierarchical structure.

In order to account for the first point, in Chap. 3 we used multi-group confirmatory factor analysis (MGCFA) to test for scale comparability or invariance (Davidov et al. 2014; Millsap and Meredith 2007) of the three variables that are to be used as outcomes in the remaining analytical chapters (namely student attitudes of tolerance toward equal rights for immigrants, ethnic groups and women). We rescaled resulting coefficients so as to ensure comparability with ICCS 2009 scaling procedures for attitudinal measures (Schulz et al. 2011).

In Chaps. 4–7, we used different specifications of multilevel models to analyze the relationship between selected explanatory variables and student attitudes toward equal rights while accounting for the nested structure of the ICCS data (students in schools, schools in countries). Parameters are estimated using maximum likelihood estimation, and missing data are handled using full information

maximum likelihood, which is proven to be more efficient and to have less bias than alternative procedures (Enders 2001; Enders and Bandalos 2001).

Chapters 4, 6 and 7 describe three-level models with students at level one, schools at level two and countries at level three. Even though the predictors we use in these chapters are mostly only at levels one and two, we use three-level models in order to follow the principle of parsimony (a balance between simplicity and accuracy) (Seasholtz and Kowalski 1993). The obvious alternative for these analyses would be to fit two-level models for each of the 38 participating education systems. In this case, however, we would have needed to estimate 38 parameters for every predictor in the model (for example β in a regression model). Furthermore, while we would have been able to observe the variation in the strength of the relationship between predictors and outcomes across countries, we would not have had a test to assess the statistical significance of these differences. Conversely, by fitting three-level models, we estimated only two parameters for every predictor: the fixed effects that indicate the average relationship for the 38 countries between the predictor and the outcome, and the random effect that indicates the variation in this relationship across countries and provides a statistical test to evaluate the statistical significance of this variation. In other words, this specification separates all observations dependency and enabled us to draw cluster-specific inferences (McNeish et al. 2017). Following the procedure suggested by Rutkowski et al. (2010), we used separate weights for each level, so that the student-level used a combination of the student and class weights included in the ICCS 2009 database and the school-level uses the pure school weight. It is important to mention that because of the high number of predictors, their varying distribution and the specific missing value patterns across countries, the three-level models in Chap. 4 do not converge. For this reason, in this chapter, we opted to fit a two-level model for each of the education systems included in the analysis. That is, we estimated 38 parameters (one for each participating education system) for each predictor included in the model.

Another common methodological feature across most of the chapters was the inclusion of the three outcomes (namely attitudes toward equal rights for immigrants, ethnic minorities and women) simultaneously in the same model. This specification enabled us to control for each of the other egalitarian measures. For example, when including the three predictors simultaneously, the estimated relationship between student gender and their attitudes toward gender equality represented the average difference between boys and girls in their dispositions toward this specific egalitarian measure, discounting the covariance among attitudes toward gender equality, ethnic equality and immigrant equality. Chapter 5 is the exception, where the analysis focuses on only one of the outcomes: attitudes toward equal rights for immigrants.

A third methodological feature common across the chapters included in this volume is the statistical software used for the different analyses. After downloading the datasets from the IEA Data Repository, we used the IDB Analyzer (IEA 2017) to merge the data from different questionnaires and different countries into one single database. The explanatory analyses were performed using Mplus 7.4

(Muthén and Muthén 2017) and the Mplus Automation R package (Hallquist and Wiley 2016). Stata 12 (StataCorp 2011) was used for descriptive analyses and R software (R Core Team 2016) for the production of graphs.

Finally, it is important to note that in eight countries participating in ICCS 2009, the percentage of immigrant students is extremely small (less than 50 cases); these countries are Bulgaria, Chile, Chinese Taipei, Colombia, Korea, Malta, Poland and Slovakia (see Schulz et al. 2010 for more details). While we have chosen to report the results for these countries, these results should be interpreted with caution because of the sampling variability associated with the estimates. Similarly, it is important to note that Hong Kong SAR and the Netherlands did not meet the participation rates required by the ICCS 2009 sampling procedures (85% of the selected schools and 85% of the selected students within the participating schools, or a weighted overall participation rate of 75%). This means that the data collected in these countries is not strictly representative of the target population of the study. For this reason, the results reported for these countries have to be interpreted with caution. See the ICCS 2009 International Report for more discussion of this issue (Schulz et al. 2010).

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