



**A Model for  
Explaining  
Students' Civic  
Knowledge and  
Engagement**

## HIGHLIGHTS RELATING TO THE CORRELATES OF CIVIC KNOWLEDGE AND ENGAGEMENT

- In every country, the civic knowledge of 14-year-olds is a positive predictor of their expressed willingness to vote as adults. It is the most powerful predictor in many countries even when accounting for other factors.
- School practices play an important role in the civic education process. The perception of an open climate for discussion in the classroom is a positive predictor of both civic knowledge and of the likelihood of future voting in about three-quarters of the countries. Participating in a school council or parliament is related to civic knowledge in about one-third of the countries.
- Watching news programs on television is a positive predictor of civic knowledge in about half of the countries and of the likelihood of voting in nearly all countries.
- Fourteen-year-olds from homes with more educational resources have higher civic knowledge in almost all countries. This aspect of the home influences the likelihood of voting in about one-fifth of the countries.
- When other factors are held constant, female students have slightly lower civic knowledge than do males in about one-third of the countries (contrasting with analysis reported in Chapter 3). Females express a greater willingness than males to vote in about one-fifth of the countries.

Although country differences covered in previous chapters enhance our understanding of many civic education processes, numerous questions important to policy-makers, educators and researchers would remain unanswered if differences between students' civic outcomes were not explored. Our purpose therefore in this chapter is to present a model designed to shed light on two of the most important dimensions of citizenship—civic knowledge and civic engagement. The model focuses on between-student differences across and within countries, and examines the relationship of two outcomes to several indicators of home background, school and the individual. The model that we have developed for this volume is a relatively simple one. Its primary purpose is to show the main factors relating to civic knowledge and engagement across countries and to suggest directions for future analysis.

Analysis that attempts to differentiate between school-level effects and student-level effects will be explored in a later volume. More elaborate models that include such variables as extent of family discussion and a wide range of association memberships will also be examined in the future, along with models that look at more complex interactions between civic knowledge, engagement and attitudes. Because of differences between modes of course organization across countries, an analysis of the impact of enrollment in courses with civic-related content will have to be conducted on a within-country basis. Finally, because the same response categories for ethnic group and for parent education could not be used in all 28 countries, the analysis of these effects will also have to be conducted within a country or a small group of countries.

## THE MODEL

Panel 8.1 presents the details of the model. In brief, we used two dependent variables: the total score on the knowledge test and the students' stated expectation that they will vote when adults. These have been themes throughout this volume. In addition to linking these variables to explanatory factors, we were interested in analyzing the relationship between the two variables so as to address the question of whether higher levels of civic knowledge are associated with the disposition of students to participate in elections in the future. We chose the relatively narrow variable of the students' response to a question about how likely they would be to vote in the future because of the importance of electoral participation. Future analyses using broader measures will examine the extent to which engagement predicts knowledge (as well as the extent to which knowledge predicts other types of engagement).

We included two background factors in the model: gender and home literacy resources. We reported the results of relatively simple analyses of these variables in Chapter 3 but explore them in more depth here.

Although the study and its policy questions have a focus on schools, it is very likely that particular and different aspects of schooling influence different civic education outcomes. We therefore included four variables from this part of the instrument: expected further education; the students' reports of the extent to which there is an open climate for discussion in their classrooms; the students' reports of opportunities to learn about voting in school; and the students' reported participation in school councils or parliaments (see Panel 8.1). The two variables from outside the school that we included were frequency of 'spending time outside the home with peers in the evening' and frequency of 'watching television news'. Peer group and media experience can be explored with these items. Future analysis will explore in greater detail other organizational memberships, community participation and political information sources.

To compare the size and significance of these effects across countries, we estimated two separate models for each dependent variable. We did this mainly to compare effect sizes across countries in a straightforward way and because for multiple regression models it is possible to compute the correct standard errors using a jackknife procedure.<sup>1</sup> The resulting test statistics were corrected for multiple comparisons. The tables in this chapter include only significant beta coefficients. Panel 8.2 indicates some of the caveats to be considered in interpreting this analysis.

As a first step, we estimated a path regression model based on the calibration sample of 14,000 (500 student respondents chosen randomly from the weighted samples of each of the 28 countries). We then estimated separate regression models using the full weighted sample for each country.

## PANEL 8.1 Description of Variables Included in the Model

Dependent variables are (i) the total test score for civic knowledge, and (ii) the expectation of students that they will vote in the future.<sup>2</sup>

The following independent variables were included in the model:

### 1. Background factors

- *Gender*: Although there are few gender differences in civic knowledge noted in the analysis of Chapter 3, we included this variable for the following reasons. First, in a multivariate model, gender might have effects that do not manifest themselves in a bivariate analysis. Secondly, we found gender differences for participation variables and classroom climate (see Chapters 6 and 7). The variable is coded 0 for males and 1 for females (reversing the coding in the survey booklet).
- *Home literacy resources*: Home literacy resources as measured by students' reports on the number of books at home has a substantial effect on civic knowledge across countries and is the home background indicator in the model (see Chapter 3). The reasons for our focus on this variable are also found in Chapter 3.

### 2. School factors

- *Expected years of further education*: Students were asked to estimate their years of future education, including vocational and/or higher education. Apart from reflecting the individual's aspiration, this indicator may also reflect the type of school or track the student is in. It also may reflect parental and peer influences. A similar variable was an important predictor of knowledge both in the 1971 IEA Civic Education Study and in Niemi and Junn's (1998) analysis of the National Assessment of Civics in the United States.
- *Open classroom climate for discussion*: This is the international Rasch score presented in Chapter 7. It indicates individual students' perceptions of the atmosphere for expressing opinions and discussion in class, and involves students' relations with peers in the school setting as well as with teachers. This variable was a strong predictor of knowledge, attitudes and participation in the 1971 IEA Civic Education Study. See also Chapter 7.
- *Reported participation in school council or parliament*: This indicator is coded 1 for students who report having participated and 0 for all other students. Our reason for including this variable was based on the assumption from previous research that activities at the school level can enhance civic knowledge and also willingness to engage in future electoral participation. (We considered several other association membership items, but decided that this type of participation seemed to have the most unambiguous meaning across countries.) See also Chapter 7 regarding this variable.
- *Students' reports about having learned about the importance of voting*: Students were asked whether they have learned about this matter in school ('strongly disagree' to 'strongly agree'). We included this variable as a predictor for expectation to vote only. Participation in mock elections in school was an important predictor in Niemi and Junn's (1998) analysis. See also Chapter 7.

### 3. Students' activities out of school

- *Evenings spent outside home:* Students were asked how often they spent time during the evening with peers outside their homes. 'Almost every day' is coded 4, 'several days a week' is coded 3, 'a few times each month' is coded 2, and 'never' or 'almost never' is coded 1. (This reverses the coding in the survey booklet.) This variable is similar to one in a World Health Organization survey, where it was found to be a predictor of risky or anti-social behavior (Currie, Hurrelmann, Setterobutte, Smith & Todd, 2000). Future analysis will concentrate on more positive peer behaviors and out-of-school associations.
- *Frequency of watching television news:* Students reported how often they watched news broadcasts on television ('never', 'rarely', 'sometimes', 'often'). We chose this variable because television was reported in most countries to be the most important and trusted source of news among 14-year-old students (see Chapters 5 and 6). Future analysis will explore the relative role of newspaper, radio and television information.

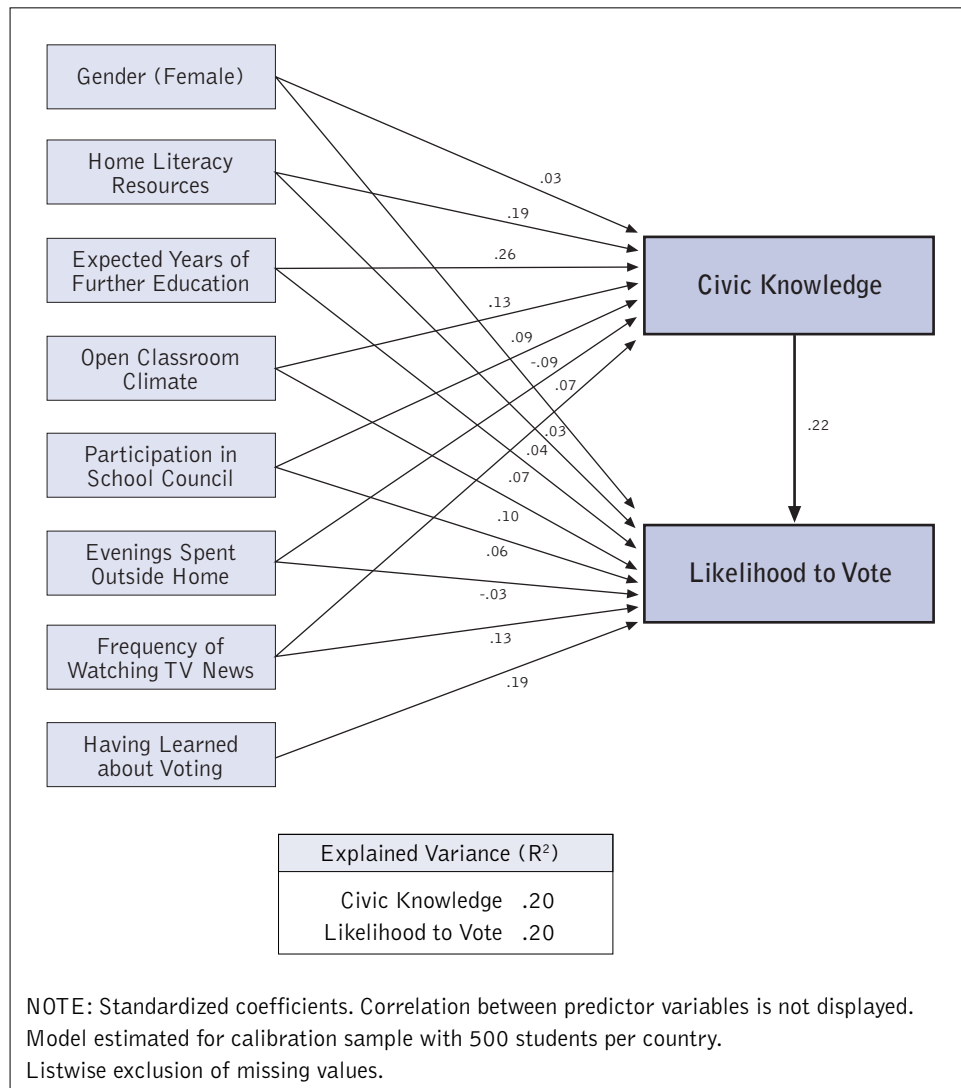
## PANEL 8.2 Interpreting the Model

The following caveats should be kept in mind when examining the results from this multivariate data analysis:

- Predictors with insignificant effects are included in the model; the explained variance for the dependent variable would be slightly lower if they had been dropped.
- Measurement errors were not taken into account when estimating the model; the structural equation model for the calibration sample is a simple path model.
- Effect sizes of single item predictors may be underestimated in the model.
- This is a single-level analysis, and context effects on the school or class level cannot be disentangled from individual effects. It is not possible to infer from the results whether possible effects of an open classroom climate for discussion are related only through the individual perception of students or whether the common perception of class atmosphere has an effect on the civic knowledge or willingness to vote as an adult.
- The model is strictly recursive, with dependent and independent variables; it is not assumed that a dependent variable might influence an independent or intervening variable. We will explore the reasoning behind this assumption in the 'Technical Report' (Lehmann *et al.*, forthcoming), and explore the models based on other assumptions and on multiple levels of analysis in subsequent volumes.

Figure 8.1 shows the results for the overall model based on the calibration sample data: the (standardized) path coefficients are the same as the beta coefficients for the two separate regression models. For both of the dependent variables, civic knowledge and civic engagement (the likelihood of voting), this model explains about 20 percent of the variance. We checked all independent variables in this overall model for multicollinearity. However, the highest correlation found between two independent variables was only  $r = .29$  for home literacy resources and expected education (in the calibration sample).

**Figure 8.1 Path Model for Civic Knowledge and Likelihood to Vote**



Source: IEA Civic Education Study, Standard Population of 14-year-olds tested in 1999.

### Predictors of Civic Knowledge in the Sample Containing 28 Countries

In this model for the calibration sample, the most important variable in explaining civic knowledge is expected further education. This variable reflects the future educational aspirations of the individual student, in many cases influenced by parents, schools and peers. In many countries it may also reflect the type of school or program in which the student is enrolled (for example, academic or pre-vocational). In some countries it has a socioeconomic component because programs that prepare students for higher education are more likely to be attended by the children of better-educated or wealthier parents.

The second largest predictor is home literacy resources, as shown in Chapter 3. The more books that students report having in their homes, the higher their level of civic knowledge.

Students' perception of an open classroom climate for discussion is another variable that is positively related to the knowledge score. This variable reflects the individual's perception of the atmosphere in class. As such, perceptions may vary within a class. However, in this area, an individual's view of whether it is a good idea to express an opinion is one factor that is important in determining whether he or she will become involved in class discussion.

Predictors with significant but smaller positive effects on civic knowledge in this model are the reported participation in a school council or parliament and the frequency of watching television news. In the overall model, gender has a relatively small effect on civic knowledge.

Spending evenings outside home is the only independent variable negatively related to civic knowledge. Those students who report that they spend most evenings with peers outside home have lower test scores than others. This negative effect can be interpreted in several ways. Students may have generally lower achievement in school if they spend a lot of time away from home and neglect their studying. The findings relating to this question may also reflect a tendency for some students to orient to the values held by their peers rather than to those held by parents or teachers. Students who do not achieve well at school may focus on peer-groups as a source of identity. The health surveys that have used this question have found that it relates to young people's engagement in risky and sometimes anti-social behavior (see, for example, Currie, Hurrelmann, Setterobotte, Smith & Todd, 2000).

### **Predictors of Civic Knowledge within Individual Countries**

Table 8.1 shows the regression results for civic knowledge separately by countries (using the full sample). The explained variance in civic knowledge ranges from 10 percent in Colombia and 13 percent in Romania, to 33 percent in Hungary and Slovenia and 36 percent in the Czech Republic; the median is 22 percent. The only significant predictor in every country is student's expected level of future educational attainment. Home literacy resources predicts differences in students' civic knowledge in all countries except Hong Kong (SAR). This result corresponds to the findings of the bivariate analysis in Chapter 3.

Those students who perceive an open classroom climate have higher knowledge scores in about three-quarters of the countries. The positive effects of this variable are especially notable in Belgium (French), Denmark, Estonia, the Russian Federation and Sweden. The reported participation in a student council or parliament is a significant predictor in about one-third of the countries in this study, most notably in Australia, Cyprus, Greece and Norway.

Gender (female) has moderate negative effect in 11 countries, which means that controlling for other factors reveals that males have slightly higher knowledge scores than females. This finding leads us to moderate our statements in Chapter 3 about the absence of gender differences. If we assume other factors to be equal, then in some countries gender does make a difference, as shown in the regressions. Among these factors are perceived classroom climate and expected education, both of which are higher for females. This is an important area for further analysis.

**Table 8.1 Regression Models for Civic Knowledge Within Individual Countries**

Predictor variables	Australia	Belgium (French)	Bulgaria	Chile	Colombia	Cyprus	Czech Republic	Denmark	England	Estonia	Finland	Germany	Greece	Hong Kong (SAR)	Hungary	Italy	Latvia	Lithuania	Norway	Poland	Portugal	Romania	Russian Federation	Slovak Republic	Slovenia	Sweden	Switzerland	United States
Gender (Female)	-	-	-	-.06	-	-.07	-.12	-.09	-	-	-	-.08	-	-	-	-	-	-	-.07	-	-.11	-	-.06	-	-.08	-.12	-	
Home Literacy Resources	.16	.23	.22	.24	.18	.08	.12	.13	.26	.13	.11	.25	.11	-	.16	.18	.14	.14	.17	.14	.19	.10	.15	.10	.20	.22	.23	
Expected Years of Education	.20	.22	.26	.27	.20	.33	.50	.28	.18	.26	.36	.28	.40	.17	.43	.27	.28	.32	.26	.41	.28	.25	.36	.43	.26	.27	.27	
Open Classroom Climate	.08	.17	-	.11	-	-	.08	.21	.13	.16	-	.13	.11	.08	.06	.13	.14	.13	.13	-	.12	-	.15	.12	.17	.13	.12	
Student Council/Parliament	.13	-	-	-	-	.18	-	.10	.07	-	-	.06	.13	-	.06	-	-	-	.13	-	-	-	-	.10	.09	-	-	
Spending Evenings Outside	-.12	-.11	-	-	-.05	-	-.10	-.15	-.19	-.22	-.12	-.15	-.09	-.21	-.11	-.10	-.10	-.08	-.11	-.07	-.13	-.10	-.09	-	-.08	-.07	-.10	
Watching TV News	.13	.11	-	.08	-	-	-	.07	.10	.07	.10	.08	-	.22	-	.09	.06	.08	.09	.09	-	-	.08	.06	-	-	-	
R <sup>2</sup>	.18	.25	.19	.21	.10	.22	.36	.25	.28	.22	.22	.29	.28	.17	.33	.21	.20	.21	.23	.27	.21	.13	.16	.25	.33	.21	.20	.23
Weighted N	2883	1703	2541	5343	4540	2990	3510	2778	2545	3248	2642	3419	3287	4406	3083	3690	2347	3210	2922	3236	3028	2870	2053	3380	2929	2666	2768	2439

NOTE: Standardized (beta) regression coefficients. Not significant coefficients were omitted (-).

The standard errors were estimated using a jackknife procedure for complex sampling; significance tests corrected for multiple comparisons. Listwise exclusion of missing values.

Source: IEA Civic Education Study, Standard Population of 14-year-olds tested in 1999.



Frequency of watching television news has a significant positive effect in about half of the countries. For students in Hong Kong (SAR), this variable is the strongest positive predictor of civic knowledge. Some previous studies of academic achievement or civil society participation have asked a different question, about total hours of television watching. Those studies assumed that viewing television takes time away from studying or being engaged in the community. Here we are using a different question, about watching television programs that provide information about civic and political matters. In interpreting this positive association, we cannot discount the possibility that students who are more knowledgeable about civic matters are more interested in watching television news (rather than the effect going in the other direction).

Spending evenings outside the home is negatively related to civic knowledge in all but four countries, its effect being strongest in England, Estonia and Hong Kong (SAR). Time spent 'hanging out' with peers seems to be detrimental to achievement, although we cannot be sure as to why (see discussion in previous section).

Some of these findings are quite similar to the multivariate analyses of the data from the IEA Civic Education Study of 1971. Expected further education, perception of the encouragement of expression in the classroom as well as interest in public affairs television were consistently positive predictors for the knowledge score in that study (see Torney, Oppenheim & Farnen, 1975, p.137).

## **Predictors of the Likelihood of Voting in the Sample Containing 28 Countries**

Civic knowledge is the most important variable in explaining the expectation of voting in the future in the calibration sample. Students with higher knowledge scores are more likely to expect to vote when they become adults. The second most important predictor in this model is the student's report of whether he or she has learned in school about the importance of voting. Frequency of watching television news also has a considerable positive relation to the expectation to vote. Perception of an open classroom climate, expected education, and reported participation in a school council/parliament have small positive effects. The effects of home literacy resources, gender and students' reports of spending evenings outside their homes are almost negligible (see Figure 8.1).

## **Predictors of the Likelihood of Voting within Individual Countries**

Table 8.2 presents the model results for the students' expectations that they will vote. The explained variance ranges from 9 percent in Cyprus and 13 percent in Bulgaria and Romania to 28 percent in Belgium (French) and the United States; the median is 20 percent. The score on the civic knowledge test is a significant and positive predictor in every country. It is especially strong in Australia, Belgium (French), the Czech Republic, Estonia and Sweden.

The only other predictor that is significant in every country is the students' reports of having learned about the importance of voting in school. This

Table 8.2 Regression Models for Likelihood to Vote Within Individual Countries

Predictor variables	Australia	Belgium (French)	Bulgaria	Chile	Colombia	Cyprus	Czech Republic	Denmark	England	Estonia	Finland	Germany	Greece	Hong Kong (SAR)	Hungary	Italy	Latvia	Lithuania	Norway	Poland	Portugal	Romania	Russian Federation	Slovak Republic	Slovenia	Sweden	Switzerland	United States	
Gender (Female)	-.08									.06		-.04	.07				.09			.07					.08				
Home Literacy								.08	.08			.11													.12	.13			
Expected Years of Education		.10					.13	.11	.08	.07	.18					.10			.09	.13	.08		.10	.12			.11	.09	
Open Classroom Climate	.15			.11	.16	.10		.11	.09	.08		.08	.17	.14	.09	.08	.14	.09	.08	.08			.07		.10			.15	
Learned to Vote	.12	.17	.12	.29	.18	.09	.23	.15	.16	.22	.29	.20	.09	.18	.17	.16	.20	.08	.15	.14	.14	.17	.13	.15	.20	.20	.20	.20	
Student Council/Parliament																													.07
Spending Evenings Outside	-.06																												
Watching TV News	.18	.16	.17	.09	.14	.16	.10	.15	.17	.13		.09	.15	.17	.14	.14	.18	.20	.16	.16	.11	.12	.17	.15	.12				.13
Civic Knowledge	.27	.27	.18	.15	.14	.13	.32	.23	.21	.27	.12	.26	.20	.20	.20	.26	.19	.20	.25	.23	.22	.21	.16	.18	.17	.27	.17	.21	.21
R <sup>2</sup>	.26	.28	.13	.18	.15	.09	.27	.21	.21	.22	.20	.21	.16	.20	.18	.21	.21	.16	.21	.20	.14	.13	.17	.15	.15	.27	.16	.28	.28
Weighted N	2519	1477	2020	4608	4276	2773	3017	2256	2126	2653	2180	2926	2971	3751	3009	2956	1864	2453	2440	2954	2659	2540	1810	3171	2542	2120	2167	2168	2168

NOTE: Standardized (beta) regression coefficients. Non-significant coefficients were omitted (-). The standard errors were estimated using a jackknife procedure for complex sampling; significance tests corrected for multiple comparisons. Listwise exclusion of missing values.

Source: IEA Civic Education Study, Standard Population of 14-year-olds tested in 1999.

variable is especially important in Chile and Finland, where it is the most substantial predictor. It may be, however, that students who wish to appear engaged in activities that are socially desirable to teachers or other adults respond that they are taught to vote and also that they plan to vote. Future analysis that takes the multi-level structure into account will be especially important in giving insight into the importance of these school factors.

The perception of an open classroom climate has a significant positive effect on the willingness to vote as an adult in 20 countries. Reported participation in a student council or parliament appears as a predictor only in the United States. School parliament did appear as a modest predictor in the previously discussed model based on the calibration sample. This difference in findings may result in part from the fact that school parliaments have not been organized on a widespread basis in some countries. Future analysis should explore the availability of such organizations together with students' reports of their own membership.

Home literacy resources have a moderate positive effect on the reported likelihood of voting in six countries: Denmark, England, Germany, Sweden, Switzerland and the United States. Gender (female) has a significant positive effect in six countries; in these countries female students are more likely to state their expectation of voting in the future than males. In Germany, males are more likely to say that they will vote when they are adults. In half of the countries, expected further education is positively related to expectations to vote; this effect is strongest in Finland. The frequency of watching television news is a significant positive predictor in all but two countries. Spending evenings outside the home is a negative predictor only in Australia.

Four variables are significant predictors of the likelihood of voting in 20 countries or more. These are civic knowledge; the report of the emphasis that schools place on importance of voting as a learning objective; the report of an open climate for classroom discussion; and frequency of watching television news. Three out of four of these are school-related variables.

## **SUMMARY**

A major finding from analysis of the model is the strong relationship between civic knowledge and expectations of participating in elections in the future. The more young people know about the functioning and the values of democracy, the more they expect to exercise this fundamental right of an adult citizen. This reinforces the importance of high-quality and motivating civic education programs to foster knowledge of content and skills in interpreting political communication. The fact that civic knowledge and learning about voting in school are consistent predictors in all the countries suggests that schools play a multifaceted role in this area. Another finding relating to schools is that an open classroom climate is important in fostering both knowledge and intentions to vote, as it was in the 1971 IEA Civic Education Study. Finally, there is the role of the media. The consumption of television news has a positive effect on both civic knowledge and intention to vote in the large majority of the countries participating in this study.

These findings concerning school effects are clear in this analysis in which other factors such as home literacy resources and expected further education are held constant. We can also look at the analysis in another way. When school factors are held constant, students from homes with low educational support and those who do not expect to continue their education have lower knowledge scores in nearly all countries and lower expressed interest in voting in some countries.

These analyses could be refined in many ways. Multi-level analysis would provide clarification of some of the results relating to factors such as classroom climate, participation in a school council or parliament, and opportunity to learn about voting in school. Models showing the ways that civic engagement may foster knowledge should be examined. Different predictors could be included (newspaper reading, a score including activities additional to participation in the school parliament, confidence in the effectiveness of participation, and amount of discussion in the family, to name only a few). Future international publications will include some of these analyses. National volumes can provide in-depth analyses that include variables that were not available across the entire sample of countries (such as ethnic group or type and number of civic-related classes taken).

## NOTES

- 1 The computation of standard errors was done with the program WESVAR 2.11.
- 2 Although the international Rasch score for the knowledge dimensions is a continuous variable, the item measuring students' expectations to vote is an ordinal four-point-scale. This variable and some others in the analysis were treated as if they were continuous.