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Mónica Ferrín Pereira¹, Marta Fraile^{2,3}, and Martiño Rubal⁴

Abstract

This article aims at exploring the gender gap in levels of political knowledge, with a focus on lower secondary school students in Europe. Using the International Civic and Citizenship Education Study 2009 (ICCS), we find that boys outperform girls when asked about facts, but girls demonstrate greater knowledge when asked to reason about a particular political matter. Part of the gender gap in political knowledge among adolescents appears to be a function of what is defined as knowledge. We argue for the need to include a greater variety of items to measure political knowledge, including both factual and analytical domains of knowledge.

Keywords

political knowledge, gender gap, survey methodology, political socialization, adolescent psychology

Although political knowledge is considered to be a vital ingredient of democratic health by a large body of scholars, there is nonetheless ample evidence that political knowledge is unequally distributed (Althaus 2003; Delli Carpini and Keeter 1996). In particular, one of the most recurrent results in the literature is that there are significant differences in the levels of political knowledge between men and women. Not only do women tend to provide fewer correct answers than men to political knowledge questions (Burns, Schlozman, and Verba 2001; Delli Carpini and Keeter 1996, 2000; Dow 2009), but they are also more prone than men to respond “don’t know” (hereafter, DK) to these types of questions (Fraile 2014; Frazer and Macdonald 2003; Kenski and Jamieson 2000; Lizotte and Sidman 2009; Mondak and Anderson 2004). In fact, even if most differences in political knowledge can be explained as a function of resources, opportunity, and motivation, these factors are insufficient to fully account for gender differences in knowledge (Delli Carpini and Keeter 1996).

In this article, we aim to explore gender differences in levels of political knowledge, with a focus on girls and boys in Europe. The study of this population is of particular interest because the majority of explanations of the gender gap in knowledge are connected to social, economic, and psychological processes that mostly take place during transition to adult life. In this study, we draw on data from European lower secondary school students, at a moment in their lives in which these processes have not yet been completed. In addition, this population has completed exactly the same number of years of education,

which makes it possible to keep constant one of the main determinants of knowledge for adult citizens. As a longitudinal study of the long-term effect of education on political knowledge in the U.S. case concludes, explaining citizens’ differences in civic knowledge requires attention to pre-adult causes (Highton 2009).

We find that there is a gender gap in political knowledge among children, even after controlling for different levels of access to resources, opportunities, and motivations (both at family and school levels) for girls and boys. More interestingly, this gender gap is dependent on the type of knowledge domain that is considered, namely, whether it is either more factually, or more analytically, demanding. Boys systematically know more than girls when asked about facts, but girls display greater knowledge when asked to reason about a particular political matter. These findings have implications for the study of political knowledge, suggesting that part of the gender gap in political knowledge might be a function of what is defined as knowledge. All previous studies on the persistent gender gap in knowledge of adult citizens have used data that strictly measure the factual dimension of

¹University of Zürich, Switzerland

²CSIC (Consejo Superior de Investigaciones Científicas)

³European University Institute, Fiesole, Italy

⁴European Training Foundation, Turin, Italy

Corresponding Author:

Marta Fraile, European University Institute, Via dei Roccettini, 9 (Villa Paola, VPADO7), I-50014 San Domenico di Fiesole (FI), Italy.
Email: marta.fraile@eui.eu

politics, a type of knowledge in which men apparently outperform women. We argue that it is necessary to broaden the conception of political knowledge by including a wider range of topics and cognitive domains, as the advantage of men with respect to women might decrease or even disappear (at least for certain kinds of knowledge).

The present study makes a significant contribution to the debate over gender differences in political knowledge from both a substantive and an empirical point of view. Substantively, it attempts to bridge the two literatures on young and adult political knowledge that often appear divorced. Empirically, it draws a unique and innovative distinction between factual and analytical domains of knowledge; no previous research has incorporated this important dimension in the study of the determinants of political knowledge (see, however, Prior and Lupia 2008). Finally, it brings together in the same empirical estimation all different explanations of the gender gap in political knowledge, which are not normally considered simultaneously.

The Gender Gap in Knowledge

As confirmed by a growing body of literature, the distribution of political knowledge among adult citizens is by no means uniform. However, surely one of the most perplexing gaps is that between men and women. In fact, after many attempts to account for gender differences in political knowledge, scholars are still struggling to understand this phenomenon (Burns, Scholzman, and Verba 2001; Delli Carpini and Keeter 1996, 2000; Fraile 2014; Kenski and Jamieson 2000; Lizotte and Sidman 2009; Mondak and Anderson 2004).

The most common explanation of the gender bias in knowledge is based on socialization theories. This approach argues that differences in levels of political knowledge between men and women are strongly dependent on the roles they tend to adopt in society. Traditional social norms define men as being in charge of public life; whereas women belong to the domestic or private domain, and are more committed than men to childrearing and family life. A direct consequence of the socialization process is that women might be less motivated and attracted to the political world than men (Delli Carpini and Keeter 1996).

Part of this same argument is that the knowledge gap between men and women is a product of the traditional socioeconomic disadvantages that women have generally suffered, as higher cognitive and socioeconomic resources are associated with greater levels of political knowledge. Because women normally have less cognitive and economic resources than men, they are also more likely to know less about politics than men (Verba, Burns, and Scholzman 1997).

While, today, it is evident that there is a gender gap in political knowledge among adults, there is less certainty with regard to the age at which gender differences in political knowledge become visible. Greenstein (1965) found differences between boys and girls (in grades 4 through 8) in their ability to provide accurate answers to questions such as asking the names of incumbent mayor, governor, president, and the duties of such officials and of legislative bodies. Although the level of political knowledge was low in general between children, boys significantly outperformed girls. In addition, boys were more likely than girls to be able to name an interesting news story and to declare an interest in national news (Greenstein 1965). A recent study also shows the existence of a relevant gender gap in knowledge of young children in Germany. Small boys systematically outperform small girls in both political awareness and factual questions (van Deth, Abendschön, and Vollmar 2011). Apart from these very few studies, however, major research about children has been more focused on political attitudes, and children's levels of political knowledge have seldom been systematically studied (an exception is Jennings 1996; Torney-Purta et al. 2001), in particular from a gender perspective. If anything, differences in political knowledge between girls and boys are usually described as smaller than that between men and women (Hahn 1998; Jennings 1996; Jennings and Niemi 1974).

Literature on children's attitudes toward politics, however, easily adopts traditional explanations of the gender bias in political knowledge among adults. To start with, and regarding the socioeconomic explanations, parents' resources—both cognitive and material—have been shown to have an impact on children's political attitudes and on their levels of political knowledge (Jennings and Niemi 1974; Schulz et al. 2011). However, it is unlikely that eighth-grade boys and girls significantly differ in their economic vulnerability as adults do (Verba, Burns, and Scholzman 1997) and that girls are systematically more disadvantaged than boys. As such, we would expect that the resources of the parents influence equally levels of political knowledge of both girls and boys. Gender differences in political knowledge among children—if any—should, therefore, be rooted in other aspects of socialization, more related to the transmission of gender roles by the family or the school.

There is, however, no definitive answer as to how family socialization on gender roles influences children's attitudes to politics as well as political knowledge among children. Previous research presents a fuzzy picture, in which both the school and the family seem to counterbalance each other. On the one hand, Jennings and Niemi (1968) confirmed that mothers have more influence than fathers in shaping children's attitudes toward politics, given the greater amount of time they usually spend with

children in comparison to their husbands. In addition, high homogeneity of the parents (in terms of politicization and political attitudes)—or, in other words, small gender differences between mother and father—tends to increase levels of political knowledge among both girls and boys (Jennings and Niemi 1974). The family, therefore, seems to have some impact on how children understand politics and how much they learn about it. On the other hand, Jennings and Niemi (1974) find that levels of political knowledge are highly correlated to performance of the children at school. In fact, children know more than their parents about some particular topics, as a result of socialization in school, where children are taught about political issues that have long since been forgotten by their parents (Jennings and Niemi 1974).

Despite these contributions, it remains unclear to what extent both the school and the family influence levels of political knowledge between girls and boys. Yet acquisition of political knowledge is shown to be largely age-related and a function of cognitive development (Dowse and Hughes 1971; Sigel and Brookes 1974). Under this assumption, one would expect that—even if children's political attitudes are partially shaped at home—levels of political knowledge are more dependent on the individual resources of the children, the resources of the family, and the resources of the school.

Here, we analyze data from a sample of students at lower secondary school. At this stage, the socialization process that transforms girls and boys into women and men is still not definite, and the school seems to have a relevant impact on what children know about politics (see above, Jennings and Niemi 1974). In this context, it is of key interest to test whether gender differences in political knowledge become visible at such an early stage of children's lives.

How Political Knowledge Is Measured

A more recent set of explanations of the gender gap in the knowledge of adult citizens focuses on measurement issues and departs precisely from the different positions men and women hold in the public sphere. According to this line of research, women respond to survey questions differently from men, depending on various factors, such as the environment in which they are interviewed (Prior and Lupia 2008), the sex of the interviewer (McGlone, Aronson, and Kobrynowicz 2006), the motivation to respond to each of the questions (Hannagan, Littvay, and Popa 2014), or the format of the questions (Mondak and Anderson 2004). In particular, Mondak and Anderson (2004) have demonstrated in the U.S. case that an important part of the gender gap in knowledge is a consequence of the particular format of political knowledge questions,

which allows a lot of room for guesswork (the structure normally includes closed-ended questions that have a number of options, and the respondent chooses the option she or he thinks is correct). Several studies have actually found that gender differences in knowledge are a function of the differing propensity of men and women to guess. Specifically, women are generally more risk-averse, and are less willing to guess, which creates an advantage in favor of men (Fraile 2014; Frazer and Macdonald 2003; Kenski and Jamieson 2000; Lizotte and Sidman 2009; Mondak and Anderson 2004).

Also related to measurement issues—and particularly fruitful in explaining the gender gap—is a feminist trend in political knowledge studies, which shows that measures of political knowledge used in the above-quoted studies are gender biased. As early as in the 1970s, gender researchers questioned the traditional picture of women as less knowledgeable and less engaged. In particular, they argued that gender differences were inflated because conventional research predominantly covered men's interests and fields of knowledge (Bourque and Grossholtz 1974). To put it succinctly, previous measures of political knowledge appear to contain a gender bias that is tapping at least part of the existing gender gap (Hannagan, Littvay, and Popa 2014). In fact, there is evidence demonstrating that some specific domains of knowledge are more relevant for one sex than the other (Delli Carpini and Keeter 1996). Others have found that women were more likely than men to know the name of the person in charge of their local schools (Verba, Burns, and Schozman 1997), but only recently has it been found that some policy areas and practical information are more directly relevant to women than to men. It is precisely when measuring knowledge on diverse political areas when differences between men and women disappear (Dolan 2011; Shaker 2012; Stolle and Gidengil 2010).

Explanations of this trend revert again to the different positions women and men hold in society. Women are more likely to be beneficiaries of public services and welfare state policies, and also to be employed in the public sector (Stolle and Gidengil 2010). Moreover, women's different situational experiences and positions as wives, mothers, or public sector employees lead to intrinsic differences in the issues and priorities that mobilize and interest them (Campbell and Winters 2008; Verba, Burns, and Schozman 1997). These differences may, in turn, affect the kinds of political knowledge that women possess. Given women's greater reliance on the state and their greater stake in welfare services and programs, it seems plausible that women will have more knowledge about government services, particularly when these are related to their daily activities and interests (Stolle and Gidengil 2010).

Until now, this type of research has mostly been conducted among adults, and it remains almost unexplored with regard to children. There are some indices, however, that conventional indicators that are normally used to measure political knowledge might be equally problematic for children. Moreover, studies show that boys and girls of thirteen years already have different interests, which closely correspond to the distinction between women and men's interests: while girls tend to prioritize social or environmental issues, boys give more importance to foreign policy and war (Fridkin and Kenny 2007; Lynn, Irving, and Cammock 2001).

Much less explored in relation to how political knowledge is defined is the effect of the type of cognitive domain required to answer a knowledge question, both among adults and children. To date, most surveys aiming at measuring political knowledge have mainly focused on facts. This corresponds to what Delli Carpini and Keeter (1996, 10–11) define as factual political knowledge: “the range of factual information about politics that is stored in the long-term memory.” In other words, adult citizens are asked about politicians (e.g., What is the name of the Minister of Economy?), specific knowledge about the functioning of institutions and processes (e.g., How many seats are there in Parliament?), and so on. This is the kind of data that have been used until very recently to conclude that the public is generally ignorant about politics and incompetent in democratic actions, and that there are important socioeconomic and gender knowledge gaps among citizens.

Recent research has instead argued that the common analytic definition of political knowledge (citizens' ability to provide correct answers to a specific set of fact-based survey items) presents relevant problems of validity, something that might produce misleading conclusions about the general public's competence (Boudreau and Lupia 2011) and its unequal distribution. Experiments on survey-based political knowledge measures have shown that many underappreciated attributes of survey interview contexts (including question wording, respondents' incentives, personality variations, sex of the interviewers) are significant determinants of past outcomes (see, for instance, Gibson and Caldeira 2009; McGlone, Aronson, and Kobrynowicz 2006; Prior and Lupia 2008). Hence, as a general matter, conventional survey-based political knowledge measures appear to be much less valid indicators of what citizens know about politics than many authors have previously claimed (Boudreau and Lupia 2011).

In line with this recent literature, we take the opportunity in this article to extend the measure of political knowledge to include more than strictly factual questions. Moreover, our study aims at merging the classical explanations of the gender bias in political knowledge,

with these more innovative trends, for an understudied universe: the children.

Data and Method

The International Civic and Citizenship Education Study 2009 (hereafter, ICCS) is particularly suited to test whether there are gender differences in levels of political knowledge at such an early stage in the socialization process, as the average age of the sample is 13.5 years old (a description of the dataset can be found in the Online Appendix [<http://prq.sagepub.com/supplemental/>]). In relation to the socialization and socioeconomic explanations, the questionnaire has two main advantages. First, by comparing children of the same grade at school, we keep constant one of the main determinants of knowledge among adults: education. Second, this approach allows us to simultaneously control for various potential causes of the gender gap related to socialization and socioeconomic disadvantages: resources and motivations, both at family and school levels.

With regard to measurement issues, several format aspects are controlled for in the ICCS. First, the questionnaire has been self-administered, and, thus, some of the effects of conventional surveys are avoided, such as the interviewee effect, or the tendency to risk aversion among women (and, therefore, to choose the DK option).¹ The ICCS questionnaire did not allow for the DK option, and children had to leave a blank space if they did not know the answer. Second, the ICCS study presents variation in the format of the items, including closed-ended questions with four or with two options to choose, the use of images, open-ended questions, and so on. This further contributes to minimizing the potential effect of closed-ended items in the differential propensity of men (boys) and women (girls) to guess. Third, the questionnaire is meant to cover four different content domains (Civic society and systems, Civic principles, Civic participation, and Civic identities), which include a variety of topics (their precise definitions can be found in the Online Appendix). Of these, some are presumably of more interest to girls (e.g., social and human rights, gender issues, etc.), whereas others are normally more associated with boys (e.g., law, order, crime, economy, etc.). Fourth, and especially innovative, the ICCS framework specifies two types of cognitive domains—knowing, and reasoning and analyzing—which allows for testing levels of political knowledge with another set of items different from the classical factual questions. “The first cognitive domain, *knowing*, outlines the types of civic and citizenship information that students are required to demonstrate knowledge of. The second domain, *reasoning and analyzing*, details the cognitive processes that students require to reach conclusions”

Cognitive domain: Knowing

Q What is the flag of the European Union?









Cognitive domain: Reasoning and Analyzing

In many countries, media such as newspapers, radio stations and television stations are privately owned by media companies. In some countries, there are laws which limit the number of media companies that any one person or business group can own.

CI2MOM1

Q Why do countries have these laws?

to increase the profits of media companies

to enable the government to control information presented by the media

to make sure there are enough journalists to report about the government

to make it likely that a range of views is presented by the media

Figure 1. The two cognitive domains of knowledge: An example.

Source. International Civic and Citizenship Education Study 2009 (http://www.iea.nl/iccs_2009.html), European Questionnaire.

(Schulz et al. 2008, 27). Figure 1 provides examples of the two types of cognitive domains.

To better approximate standard factual items of political knowledge—and be able to distinguish how these perform as compared with alternative measures of political

knowledge—we have decided to use the knowledge questions from the European questionnaire, together with the released analytical items of the general questionnaire (see the Online Appendix). As a consequence, this study includes the following twenty-four countries: Austria,

Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.²

The two cognitive domains mentioned above have been operationalized in two dependent variables: The first is equivalent to the conventional measures of factual political knowledge, which have been used by previous studies in the extant literature on adults and children, and the second comprises a set of items intended to measure the cognitive domain of reasoning and analyzing. Each of the items on political knowledge included in the ICCS questionnaire (see the Online Appendix) has been classified by the ICCS team either as measuring the cognitive domain of knowing, or the cognitive domain of reasoning and analyzing (each single item aims to measure only one of these two mentioned domains; *none* of them is defined as measuring both knowing and reasoning and analyzing; see the Framework assessment, by Schulz et al. 2008). As already mentioned, most surveys on adults and children that have included indicators on political knowledge (in which girls–women always know significantly less than boys–men, even though the difference is bigger among adults) have only included questions about the knowing cognitive domain. An added value of this study is that it uses questions referred to both cognitive domains: factual and analytical.

Our first dependent variable (factual knowledge) is composed of the twenty items contained in the European questionnaire (see the Online Appendix). These all belong to the cognitive domain of knowing, according to the ICCS classification. The latter are in fact equivalent (and, therefore, comparable) to the conventional measures of political knowledge used in previous studies, particularly in Europe (see, for instance, Fraile 2013). The first dependent variable—factual knowledge—hence, is a composite index of the number of correct answers to the twenty items included in the European questionnaire. A correct answer equals 1, whereas incorrect answers equal 0, and “no answer” (NA) is considered as missing data. We do not equate here the options of incorrect and NA (as conventional measures of knowledge do), following recent literature (see, for instance, Lizotte and Sidman 2009; Mondak and Anderson 2004). Self-administration of the ICCS questionnaire imposes this decision. Probably because students are used to taking written examinations—and as there were no penalties in not answering a question—NA is not equivalent in this case to DK answers in standard questionnaires. This survey mode cancels the gender bias in the propensity not to answer, and boys and girls—contrary to adults—present the same propensity to guess these survey items. Boys do in fact give NA

slightly more than girls in our survey. For this reason, NA is treated as missing data in this article.³

With regard to the second dependent variable, that referring to reasoning and analyzing (or analytical knowledge), it is intended to gauge students’ capacity to think critically about political matters (Schulz et al. 2008). This variable incorporates thirteen items included in the general questionnaire, which have been classified as *reasoning and analyzing* by ICCS (see the Online Appendix), as a composite index of the number of correct answers (again, we do not find any gender bias in the propensity not to answer). Detailed information about all the topics covered by the items included on each dimension of civic knowledge (and their corresponding format) can be found in the Online Appendix.

To test empirically for the potential gender differences in the two cognitive domains of political knowledge analyzed here, we perform a three-level multilevel analysis (that is, individuals, schools, and countries). We have replicated the same estimation for each of the two dependent variables, in which a range of variables that control for the standard antecedents of knowledge in the literature on adults has been specified (i.e., individual differences in resources, motivation, and ability; Delli Carpini and Keeter 1996; Luskin 1990). In addition, we control for resources and motivation at the family and school levels following previous studies of the determinants of civic knowledge among students (see, for instance, Schulz et al. 2011).

Results and Analysis

Table 1 shows the differences in the percentages of correct answers between boys and girls for each of the constituent items of the two dependent variables. Positive percentages in the table indicate that boys outperform girls, whereas negative percentages indicate that girls outperform boys. Several conclusions can be drawn from Table 1. First, there are significant differences with regard to levels of political knowledge when we consider either factual or analytical questions. Boys tend to perform better in factual questions (even if, among factual items, the topic is also a relevant issue; see below). To the contrary, girls provide more correct answers to analytical questions, as compared with boys. Second and format-wise, differences between girls and boys do not seem to be dependent on the format used in each of the questions because we find significant gender differences of relevant magnitudes in questions that use both true–false and multiple-choice format, or both images and words (see columns 5 and 6 in Table 1).

Third, there are gender differences in relation to the topics covered by each of the questions (see columns 4 and 6 in Table 1). Table 1 confirms that boys tend to

Table 1. Differences in the Percentages of Correct Answers between Boys and Girls across Items.

No	ID	Cognitive domain	Key content	Format	% Δ^a
1	ES2T01A	Factual	Membership	T/F	-0.5***
2	ES2T01B	Factual	Nature EU	T/F	1.0***
3	ES2T01C	Factual	Political rights EU	T/F	1.6***
4	ES2T02	Factual	Symbol EU	Quiz (image)-MC	2.2***
5	ES2T03	Factual	Members EU	Quiz-MC	1.0**
6	ES2T04	Factual	Requirement EU membership	Quiz-MC	0.5*
7	ES2T05	Factual	Functioning EU	Quiz-MC	3.7***
8	ES2T06	Factual	Functioning EU	Quiz-MC	1.6***
9	ES2T07	Factual	Functioning EU	Quiz-MC	1.9***
10	ES2T08	Factual	Enlargement	Quiz-MC	-0.3
11	ES2T09A	Factual	EU policies: School	T/F	-2.5***
12	ES2T09B	Factual	EU policies: Peace	T/F	-0.5**
13	ES2T09C	Factual	EU policies: Human rights	T/F	-0.9***
14	ES2T09D	Factual	EU policies: Environment	T/F	7.8***
15	ES2T09E	Factual	EU policies: Agriculture	T/F	7.5***
16	ES2T10	Factual	EU rights	MC	-0.6**
17	ES2T11A	Factual	Euro: Official currency	T/F	0.6*
18	ES2T11B	Factual	Euro: Official currency	T/F	2.2***
19	ES2T11D	Factual	Euro: Design	T/F	0.1
20	ES2T12	Factual	Advantages Euro	MC	-2.2***
21	CI2COM1	Analytical	Symbols	Quiz (image)-MC	-7.7***
22	CI2MOM1	Analytical	Media freedom	Quiz-MC	-6.9***
23	CI2MLM1	Analytical	Minority languages	Quiz-MC	-7.5***
24	CI2MLM2	Analytical	Minority languages	Quiz-MC	-2.4***
25	CI2PDO1	Analytical	Freedom of speech	Open ended	-7.3***
26	CI2RDM2	Analytical	Horizontal accountability	Quiz-MC	-1.7***
27	CI2SHM1	Analytical	Fair trade	Quiz-MC	-3.2***
28	CI2SHM2	Analytical	Fair trade	Quiz-MC	-4.5***
29	CI2TGM1	Analytical	Vertical accountability	Quiz-MC	-4.1***
30	CI2TGM2	Analytical	Secret policy	Quiz-MC	8.2***
31	CI132M1	Analytical	National symbols	Quiz-MC	-6.7***
32	CI115M1	Analytical	Civic liberties	Quiz-MC	0.7
33	CI129M1	Analytical	Democracy	Quiz-MC	1.5**

Source. Our elaboration on International Civic and Citizenship Education Study 2009 (ICCS), students from grade 8, ISCED Level 1.

T/F = true/false; MC = multiple choice; % Δ = percentage of differences between boys and girls (boys-girls).

^aPositive percentage indicates that boys outperform girls.

* $p < .10$. ** $p < .05$. *** $p < .01$.

outperform girls on the following topics: functioning of the European Union (EU) and EU policies, economics, and secret policy. In contrast, girls outperform boys on the following issues: group rights, media freedom, freedom of speech, fair trade, national symbols. These findings echo recent studies of children (Fridkin and Kenny 2007; Lynn, Irving, and Cammock 2001; van Deth, Abendschön, and Vollmar 2011) and adult samples (Campbell and Winters 2008; Fitzgerald 2013; Stolle and Gidengil 2010), and clearly show that gender differences in terms of political interests arise early in life.

In short, findings from Table 1 suggest that there are relevant differences between girls and boys both in terms

of the topics and the cognitive domains contained in the knowledge questions. This first explorative evidence supports, therefore, our critique that part of the gender gap might be a function of what is defined as knowledge, at least with regard to children.

But do significant differences remain when we control for the different access of girls and boys to resources, opportunities, and motivations (both at family and school levels)? Tables 2 and 3 present the results of the estimation of several random intercept multilevel models with students clustered in schools, and schools clustered in countries. Intercepts are allowed to vary both within schools and within countries (random slope models for

Table 2. Gender as Determinant of Factual Knowledge: Multilevel Estimations.

Variables	Factual knowledge			
	Eq. 1	Eq. 2	Eq. 3	Eq. 4
Individual level				
Gender (female)		-0.234*** (0.019)	-0.306*** (0.019)	-0.300*** (0.021)
Expected education (1 = low to 5 = high)			0.492*** (0.010)	0.488*** (0.011)
Same language of the country (0 = no to 1 = yes)			0.233*** (0.036)	0.217*** (0.040)
Education parents (1 = low to 12 = high)			0.052*** (0.005)	0.050*** (0.005)
Political interest parents (1 = low to 8 = high)			0.069*** (0.007)	0.063*** (0.008)
N books at home (1 = no books to 6 = a lot)			0.200*** (0.008)	0.203*** (0.008)
Exposure to TV news (1-4 days per week)			0.202*** (0.009)	0.203*** (0.010)
Exposure to newspaper news (1-4 days perweek)			0.073*** (0.009)	0.075*** (0.010)
School level				
Ratio students/teachers (1-68)				0.016** (0.006)
Social conflicts in community (22-77)				-0.014*** (0.002)
Resources in community (0 = low to 9 = high)				0.017 (0.011)
Var. country	0.491	0.490	0.405	0.412
Var. school	1.216	1.217	0.806	0.776
Var. residual	5.929	5.902	5.303	5.284
Constant	12.768*** (0.148)	12.888*** (0.148)	8.606*** (0.149)	9.148*** (0.202)
Observations at the individual level	75,331	74,715	69,161	56,893
Observations at the school level	3,174	3,174	3,174	2,588
Observations at the country level	23	23	23	23

Source. Our elaboration on International Civic and Citizenship Education Study 2009 (ICCS), students from grade 8, ISCED Level 1.

Figures in parentheses are standard errors.

* $p < .10$. ** $p < .05$. *** $p < .01$.

countries were also estimated, but the variance of the random slope never reached statistical significance, and the model did not improve random intercept estimations). For each dependent variable, we present four equations, in which each level (individual, school, and country levels) is introduced gradually. The first column of Table 2 indicates the measurement for each of the independent variables. Descriptive statistics and exact wording of the items are provided in Appendix Tables A1 and A2, respectively.

As expected and confirming previous studies, all individual level factors have a significant impact on levels of political knowledge, with the exception of children's exposure to newspapers for analytical knowledge (see, for instance, Schulz et al. 2011). Accordingly, the greater the resources in the household (material resources, such as number of books), and the greater the individual resources of the parents (cognitive mobilization, in terms

of parental levels of education and political interest), the higher the level of political knowledge of the child. Furthermore, young students' exposure to television news also increases their level of political knowledge, while exposure to newspaper news only significantly improves factual political knowledge. Resources and motivation at the individual level also appear to be related to higher levels of both factual and analytical political knowledge: those students speaking the language of the country at home present significantly higher levels of knowledge. In addition, the more the child's number of expected years of further education, the higher their level of political knowledge.

Moving to the school level, the compositional effects of individual level explanations reduce variance at the school level to the minimum for the case of analytical knowledge. In other words, differences in levels of analytical knowledge between schools are mostly due to

Table 3. Gender as Determinant of Analytical Knowledge: Multilevel Estimations.

Variables	Analytical knowledge			
	Eq. 1	Eq. 2	Eq. 3	Eq. 4
Individual level				
Gender (female)		0.234*** (0.026)	0.176*** (0.026)	0.165*** (0.029)
Expected education (1 = low to 5 = high)			0.351*** (0.014)	0.341*** (0.015)
Same language of the country (0 = no to 1 = yes)			0.364*** (0.048)	0.356*** (0.054)
Education parents (1 = low to 12 = high)			0.066*** (0.007)	0.065*** (0.008)
Political interest parents (1 = low to 8 = high)			0.049*** (0.010)	0.049*** (0.011)
N books at home (1 = no books to 6 = a lot)			0.172*** (0.011)	0.170*** (0.012)
Exposure to TV news (1–4 days per week)			0.108*** (0.013)	0.115*** (0.015)
Exposure to newspaper news (1–4 days per week)			0.017 (0.014)	0.008 (0.015)
School level				
Ratio students/teachers (1–68)				0.008* (0.005)
Social conflicts in community (22–77)				–0.007*** (0.002)
Resources in community (0 = low to 9 = high)				0.031*** (0.008)
Var. country	0.156	0.154	0.164	0.166
Var. school	0.144	0.136	0.000	0.000
Var. residual	8.791	8.791	8.644	8.676
Constant	4.358*** (0.082)	4.249*** (0.083)	0.828*** (0.121)	1.019*** (0.162)
Observations at the individual level	55,924	55,308	51,191	42,025
Observations at the school level	3,308	3,308	3,307	2,693
Observations at the country level	24	24	24	24

Source. Our elaboration on International Civic and Citizenship Education Study 2009 (ICCS), students from grade 8, ISCED Level 1.

Figures in parentheses are standard errors.

* $p < .10$. ** $p < .05$. *** $p < .01$.

characteristics of the students (their motivations and resources), which vary greatly across different schools. Although we also appreciate some compositional effects with regard to factual knowledge, these are less clear, and variance at the school level remains. In fact, resources of the school or the community (where the school is situated) significantly affect children's factual knowledge. In addition, children perform increasingly better in political knowledge as the ratio of teachers per student becomes bigger (teachers/students). Similarly, children who live in local communities with more resources (libraries, cinema, theater, music hall, etc.) and less social conflict know more about politics than children who live in more disadvantaged contexts.

With regard to the socialization explanations, both the family and the school matter in promoting children's political knowledge. The more the resources of the family

and of the school, the higher are the levels of political knowledge of girls and boys. The most important finding, however, is that the gender gap in political knowledge remains even after controlling for the varying access of girls and boys to resources, opportunities, and motivations. Moreover, the gender gap varies for each of our two dependent variables. Girls present higher levels of analytical political knowledge, while boys have higher levels of factual political knowledge.

There are two potential explanations for these results, in the light of previous findings from other studies. The first relates to the type of abilities required to develop each type of political knowledge, as recent evidence from the Organisation for Economic Co-operation and Development (OECD) 2010 (PISA) study suggests. PISA 2009 shows that girls outperform boys in reading (see OECD 2010: Table A1.2, Figure I.2.17, and Tables I.2.2

and I.2.3) and digital reading, while boys outperform girls in mathematics (González de San Román and Rica 2012; OECD 2010, 154). Consequently, boys are generally more factually oriented, whereas girls seem to be better at reasoning about politics. Also related to this is that the type of ability required to answer a question tends to be somehow linked to the particular domain the question relates to. As such, factual knowledge can only be asked about facts or specific objects—here, the EU and its functioning. We have previously shown (see Table 1) that boys perform much better than girls on domains related to the functioning of the EU and EU policies, the economy, and secret policy, while girls perform better on issues linked to human and social rights. Both the type of knowledge (analytical vs. factual) and the specific domain that is asked about have, therefore, a significant impact on gender differences in political knowledge among children. This further indicates that a gendered socialization has already affected the roles of boys and girls in their early life, and, accordingly, their interest in diverse topics. This might happen through the media, the school, the family, and their peers.

A second possible explanation derives from the line of research that posits that women respond differently to survey questions depending on the survey interview context (McGlone, Aronson, and Kobrynowicz 2006). As recent evidence confirms, levels of political knowledge and differences between men and women are partly dependent on the amount of information that is available in the context in which the questionnaire is fulfilled. As such, information-rich contexts contribute to a reduction of the inequalities in knowledge (Berggren 2001; Fraile 2013; Iyengar et al. 2010). For example, the knowledge gap between adult men and women disappears in information-rich environments, like a political campaign (Ondercin, Garand, and Crapanzano 2011).

In line with this argument, our findings suggest that differences between boys and girls might be prompted by the different format of factual and analytical questions. As shown in the Online Appendix (where a detailed list of the wording of the items included in the indexes of both analytical and factual knowledge is provided), the amount of information provided in the analytical knowledge items is usually larger than the amount of information provided in the factual knowledge questions. The fact that girls outperform boys in analytical questions might be connected to the amount of information provided in the analytic questions, which could raise girls' motivations in answering them correctly. As argued in a recent study, men and women tend to perceive somewhat differently the diverse political spheres in which they operate: accordingly the strategy of men and women in recording political information might also be different (Hannagan, Littvay, and Popa 2014). All this reinforces our claim that

boys and girls respond differently to knowledge questions, something that we can partially control for, once we do not restrict our measurement of political knowledge to factual questions solely.

To close, results suggest that gender differences in political preferences surface at a very early moment in the socialization process, significantly influencing what and how much girls and boys know about politics. These findings have many implications for the literature on the determinants of political knowledge among both children and adult citizens. These are discussed in the following section.

Discussion and Conclusion

This article has examined whether the gender gap in political knowledge is only typical among adults, or it appears instead at an early age. In addition to socialization theories, this study has also incorporated a number of measurement issues that are hardly considered in the study of children's political knowledge. We show evidence of a relevant gender gap in knowledge, which persist even after controlling for the different access of girls and boys to resources, opportunities, and motivations. The gender gap, however, is dependent on the type of cognitive domain required to answer the knowledge questions. Boys perform better on factual knowledge, whereas girls are better on analytical knowledge.

Our findings go in the same direction as a few recent studies on adults' knowledge, which argue that at least part of the gender gap might be a product of the way political knowledge has been conventionally measured, which appears to be gender biased (Dolan 2011; Hannagan, Littvay, and Popa 2014). In line with studies showing that women and men approach politics differently (Fitzgerald 2013), we find that boys know more about the functioning of the EU, EU policies, and economics, while girls know more about human and social rights. However, the issue is more complex still. Differences between boys and girls depend also on the cognitive domain required to answer each particular item. These findings have implications for the future of the study of political knowledge.

First, differences in how each gender approaches politics seem to appear at an early age, before even children have fully adopted a role as women or men in society. It is here confirmed that girls know more about areas that are closer to the traditional role of women in society (such as human or social rights), something that has also been found in the case of adults (at least in the United States; see Highton 2009; Wolak and McDevitt 2011; or the United Kingdom; see Campbell and Winters 2008). These findings suggest the need to adopt a gender perspective when studying children's political knowledge,

which until now has been absent in previous studies. And vice versa, explaining gender differences in knowledge among adults requires attention to pre-adult causes.

Second, our findings suggest that gender differences might be a function of the type of items that are conventionally used to measure political knowledge, normally limited to the knowledge of facts about the political world. Boys—as men do—know more than girls about political facts, but girls are better than boys at understanding and analyzing politics. In the light of these results, a major question needs to be addressed in the future research on political knowledge: do these differences endure throughout adulthood? Unfortunately, there is an absence of longitudinal studies in Europe, which would allow answering such a question. Still, the scarce cross-sectional evidence available (results coming from both the International Adult Literacy Survey [IALS] and the International Adult Literacy and Life Skills Survey [ALL]) suggests that differences in cognitive abilities between boys and girls persist throughout life. Men (as boys) tend to display an advantage in numeracy and document literacy, while women (as girls) tend to display an advantage in prose literacy (see OECD 2005, 46–47).

Our study is based in evidence coming from Europe, but other countries show similar patterns as well. For instance, the solely longitudinal evidence we are aware of is of the U.S. case. This data indicate that gender differences in the type of cognitive domain children are better at remain until adulthood (see the significant and persistent gender differences in both factual political knowledge and ideological knowledge across four decades

shown in Highton 2009). In this respect, longitudinal studies in European countries need to be undertaken in the future.

All of these suggest that future research in the discipline of political science should adopt innovative ways of measuring political knowledge. Politics is related not only to governments' actions and to how power is distributed but also to the distribution of goods, services, and the relationship between citizens and the government (Hannagan, Littvay, and Popa 2014). However, whereas recent studies argue for the need to include a greater variety in the content of the items used to measure knowledge, we also advocate for the need to include items related to both factual and analytical knowledge.

A persistent debate in relation to the gender gap in political knowledge is whether women are less well represented by the democratic institutions, as a consequence of their relative ignorance about the traditional arenas of electoral and legislative political matters (an arena that is often perceived as a men's game and primarily understood to be electoral). Here, we open a new debate: What if women have a different type of knowledge about politics than men? What if women know less about political facts but are better able to reason about politics than men? Would that not be an advantage in favor of women? So far, our results are confined to a specific population: children around thirteen years old. For this reason, it is of extreme importance that future research about adults' political knowledge adopts a more innovative approach by considering the distinctive psychological orientation to politics of male and female.

Appendix

Table A1. Descriptive Statistics of the Variables Used in Table 3 in the Main Text.

	Minimum	Maximum	M	SD
Factual Political Knowledge	0	20	12.873	2.754
Analytical Political Knowledge	0	13	4.374	3.018
Gender	0	1	0.501	0.500
Expected education	1	5	4.001	1.035
Same language	0	1	0.864	0.343
Education parents	1	12	8.635	2.199
Political interest Parents	1	8	5.360	1.411
N books at home	1	6	3.485	1.341
Exposure to TV news	1	4	2.815	1.092
Exposure to Newspapers news	1	4	2.166	1.078
Ration students/teachers	1.030	68.571	4.508	3.479
Social conflicts in community	22.563	77.178	48.496	9.410
Resources in community	0	9	6.823	1.931

Source. Our elaboration on International Civic and Citizenship Education Study 2009 (ICCS), students from grade 8, ISCED Level 1.

Table A2. List of the Original Wording and Measurement of All the Variables Specified in the Estimation Equation of Table 3.

Gender: Are you a girl or a boy?

Expected education: Which of the following <levels of education> do you expect to complete? *(Please tick only one box)*

<ISCED level 5A or 6>

<ISCED level 4 or 5B>

<ISCED level 3>

<ISCED level 2>

I do not expect to complete <ISCED level 2>

Same language: What language do you speak at home most of the time? *(Please tick only one box)*

<Language of test>

<Other language 1>

<Other language 2>

<Another language>

Education parents: What is the <highest level of education> completed by your mother/father or <female/male guardian>? *If you are not sure which box to choose, please ask the <test administrator> for help. (Please tick only one box)*

<ISCED level 5A or 6>

<ISCED level 4 or 5B>

<ISCED level 3>

<ISCED level 2>

<ISCED level 1>

She did not complete <ISCED level 1>

Political interest parents: How interested are your parent(s) in political and social issues? *(Please tick only one box in each row)*

Very interested

Quite interested

Not very interested

Not interested at all

N books at home: About how many books are there in your home? There are usually about 40 books per meter of shelving. Do not count magazines, newspapers, comic strips, or your schoolbooks. *(Please tick only one box)*

0–10 books

11–25 books

26–100 books

101–200 book

201–500 books

More than 500 books

Exposure to TV news: How often are you involved in each of the following activities? *(Please tick only one box in each row)* Watching television to inform yourself about European news.

Never or hardly ever

Yearly (at least once a year)

Monthly (at least once a month)

Weekly (at least once a week)

Exposure to Newspapers news: How often are you involved in each of the following activities? *(Please tick only one box in each row)* Reading the newspapers to inform yourself about European news.

Never or hardly ever

Yearly (at least once a year)

Monthly (at least once a month)

Weekly (at least once a week)

Ratio teachers/students, combination of:

What is the number of teachers in this school? *Include both full-time and part-time teachers.* (a) Teachers instructing at <target grade>

On <1 September 2008>, what was the total enrollment (number of students) for <target grade>? *(Please write a number on each line. Write 0—zero—if there are none.)*

(a) Number of boys:

(b) Number of girls:

Social conflicts in community: To what extent are any of the following issues a source of social tension in the area in which this school is located?

Please tick only one box in each row. (a) Immigration, (b) Poor quality of housing, (c) Unemployment, (d) Religious intolerance, (e) Ethnic conflicts, (f) Extensive poverty, (g) Organized crime, (h) Youth gangs, (i) Petty crime, (j) Sexual harassment, (k) Drug abuse, (l) Alcohol abuse

To a large extent

To a moderate extent

To a small extent

Not at all

Resources in community: Are the following resources available in the local area where this school is located? *Please consider as “local area” an area of a radius of approximately five kilometers.* (a) Public library, (b) Cinema, (c) Theater or Concert Hall, (d) Language school, (e) Museum or Art Gallery, (f) Playground, (g) Public garden or Park, (h) Religious center (for example, church, mosque, synagogue), (i) Sports facility (for example, swimming pool, tennis courts, basketball court, <football> field)

Yes

No

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Notes

1. We elaborate more on this point in note 3.
2. All items of analytical knowledge were asked in all twenty-four countries, whereas items of factual knowledge were asked only in twenty-three countries. See the bottom of Tables 2 and 3, where the number of observations is twenty-three and twenty-four, respectively.
3. This decision is also supported by the fact that none of the classical antecedents of political knowledge performs well in explaining the number of no answers (NA). We have replicated the analyses presented in Tables 2 and 3 for the number of incorrect and NA. Whereas results for the number of incorrect answers correspond exactly to the results of Tables 2 and 3—except that the coefficients are negative—the results for the number of NA are not conclusive, because most of the coefficients turned out to be non-statistically different from zero.

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