Public Television, Private Television and Citizens' Political Knowledge

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Version: October 2009

Abstract:
This paper examines cross-national variance in the impact of public and commercial television on citizens' political knowledge level and whether and how that variance may be related to differences in the content of public television broadcast. Multilevel models are used to link micro-level information on citizen knowledge from the European Election Studies of 1999 and 2004 to macro-level information about media systems and how public television operates in different contexts that we compiled from a variety of information sources. We find that exposure to news programs on public and private television channels are both positively associated with political knowledge after stringent controls for possible shared determinants of news exposure and knowledge, but only among less interested citizens. While exposure to news on public television appears to have, on average, a more positive effect than exposure to news on private channels, the difference is not significant and varies greatly across contexts. Public television seems more effective in informing citizens in countries where public television is largely independent of commercial revenue and uses its public funding to provide a particularly large amount of news and information programs for a politically very heterogeneous audience. However, private television appears to have the advantage in countries characterized by the opposite characteristics and relatively lower levels of press freedom. The discussion relates our findings to debates about the virtues of public broadcasting.

It is often claimed that highly informed actors are usually more effective than know-nothings in obtaining the outcomes that best conform to their preferences (see Mansbridge 1983; Dahl 1989: 180-1; and with reference specifically to voting behaviour and public opinion Delli Carpini and Keeter 1996: 56; Downs 1957: 258; Hutchings 2003). A possible implication of the same argument is that elections only enhance collective welfare to the extent that citizens are knowledgeable about politics (cf. Adserá *et al* 2003; Gastil 2000; Toka 2008). Mass media are the principal source of political information for the majority of citizens in contemporary societies. Therefore, understanding how citizens may learn from the media, what kind of media messages and type of media channels are more conducive to learning about politics has been an important endeavour in political communication (Holbert 2005).

This paper seeks to advance knowledge about what media systems provide better information to citizens and are likely to be associated with higher political knowledge. We expect that better information means access to more and more diverse (politically relevant) information. However, the propensity of the average citizen with heavily limited motivation, time and resources to learn something about politics is not only a function of information availability but also that of its cognitive accessibility and political credibility. The freedom, political balance, diversity, and – commercial or public service or partisan – motivation of different media may thus affect to what extent a particular media system is an efficient means of delivering political information to a wide range of people who have more important goals in life than learning about politics.

In the first section we discuss our theoretical expectations. Section two describes the data sources and the way we obtain a cross-nationally comparable measure of citizens' information level for a large number of countries in two different years. Section three explains the measures for the independent variables and the design of the statistical analysis. Section four presents the empirical analysis, and section five concludes.

1. The information environment: Why and how it may matter

Many previous studies demonstrated that greater political knowledge has a variety of important consequences on political attitudes and behaviour (cf. Luskin 2003). Taken together, they suggest that citizens with a greater stock of whatever political information are more likely than information underdogs to make choices that probably better reflect their underlying preferences. For instance, better informed citizens are more likely to anchor their vote choices in their own issue preferences, ideological orientation and performance evaluations (Andersen *et al* 2005; Bartle 2004; Delli Carpini and Keeter 1996, 256-8; Gomez and Wilson 2001; Goren 1997; Jacoby 2006; Lau and Redlawsk 2001; Lupia 1994; Luskin 2003; Sniderman *et al* 1990; Sturgis and Tilley 2004; but cf. Zaller 2004). In addition, evidence from deliberative polls demonstrates that cycles in collective preferences become less frequent as citizens become more knowledgeable (see Farrar *et al* 2006; List *et al* 2006). All this provides indirect evidence that as citizens' political knowledge increases, vote choices and political attitudes often – though probably not always – become increasingly more accurate expressions of the policy preferences that people would hold if

they were fully informed, and that informed preferences may be more likely to reflect the 'true views' of citizens than their uninformed preferences. The same points are borne out by some formal models and experimental results (McKelvey and Ordeshook 1985a, 1985b; Lupia 1992; Lau and Redlawsk 2001). Lastly, Toka (2008) demonstrates that over a few rounds of elections, a smaller gap between actual election results and those that may obtain if citizens were more highly informed leads to improvements in otherwise very stable aspects of the quality of governance in a country. It would thus seem important for the health of democracy to achieve higher information levels among citizens. This, of course, is one of the conventional arguments in favour of regulating and publicly funding broadcasting corporations. However, little prior research exists about the empirical assumptions underlying the public good justifications for these arrangements. This is the gap that we try to address in this paper.

Political knowledge depends on three (interrelated) sets of factors: capability, motivation and opportunity (Luskin 1990). The first two are characteristics of the individual citizen, whilst opportunity is largely a matter of the information environment, which is in turn dependent on characteristics of the media system and of the political context. Put very briefly, it is likely to be easier to acquire political knowledge for those more capable to seek, retain and understand the available information – presumably those with more time, intelligence and formal education – and/or are more motivated to learn due to sheer interest, partisan attachment, professional reasons, etc. [ADD REF TO KNOWLEDGE GAP LITERATURE] The extent to which citizens can get hold of information depends on the contextual opportunities, *i.e.* (a) the information offered by the mass media, as the main source of information for the majority of the citizens; and (b) the simplicity and/or clarity of the political choices presented by the political contenders. For instance, it would seem particularly difficult to make an informed decision (e.g. in line with value preferences) on an electoral reform referendum issue when no mainstream media provided an accurate presentation of the alternatives discussed. Similarly, it must be a lot easier to follow details of policy offering in a stable two-party system than in a country where a new set of parties reigns supreme in every election.

The key elements at the intersection of which political knowledge acquisition is found - the citizenry, the political system and the media system – vary on a range of dimensions, which interact both within and across the three categories as well as with political knowledge itself.[1] These patterns of interdependency can make causal relationships particularly difficult to pin down, even more difficult than in other cases of media influence.[2] Figures 1 and 2 give a hint about the likely complexity of the relationships.

- Figure 1 and Figure 2 here -

The importance of the information environment for knowledge acquisition has been generally acknowledged in the political science literature (Delli Carpini and Keeter 1996:

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[1] Note that the three elements - the citizenry, the political system and the media system – are those suggested by Blumler and Gurevitch as "areas recommended for dimensionalizing" in comparative analyses of political communication (Blumler and Gurevitch 2004).

[2] For a discussion of conceptualising and modelling media effects see Popescu (2007a and b).

209; Althaus 2003; Zaller 1996). However, it was rarely studied systematically (but see e.g., Jerit *et al* 2006; Popescu and Toka 2007; Curran *et al* 2008). In their longitudinal analysis of US data, Jerit, Barabas and Bolsen estimate that "25% of the variance in levels of political knowledge is attributable to environmental-level factors" (Jerit *et al.* 2006: 275). However, that variance may be much higher in other countries, where political predispositions (say partisanship) are weaker, but also because all these factors are interacting with each other (see Luskin 1990: 335).

As Figure 1 shows, we consider the information environment as the central element of the opportunity structure that shapes differences in political knowledge among citizens across information contexts. The probably most relevant cognitive characteristics of the information environment are the complexity, consistency, credibility, relevance and accessibility of the messages circulating in it.[3] The information environment itself is too general a concept to be measured directly, but its propensity to display the relevant characteristics is dependent on the characteristics of the mass media as well as of the political context.

Although interpersonal communication can be a valuable, flexible and conveniently customized source of information, we would nevertheless expect that people attending to news media be, *ceteris paribus*, a bit more informed than their peers.[4] The reason for this may be genuine learning from the media, or just selective exposure by the people who are already more interested, more knowledgeable and better equipped to learn new things about politics from just about any source. If the first were the case, then one would expect that the information level of the population rise as exposure increases. If, however, selective exposure drives the individual-level relationship between knowledge and exposure, then one would probably not expect it to replicate at the aggregate level.[5]

It has been argued that commercial media are less conducive than public broadcasting to the creation of an informed citizenry (Aarts and Semetko 2003, Dimock and Popkin 1997, Patterson 2003, Prior 2003, Robinson and Levy 1986, Schmitt-Beck 1998). This argument usually refers to commercial media's focus on low-brow entertainment, and there is supportive empirical evidence for a bigger positive impact of public broadcasting on citizen knowledge, though lacking or imperfect controls for selective exposure remain a problem in these studies (Aarts and Semetko 2003, Curran *et al* 2009, Holtz-Bacha and Norris 2001).

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[3] Previous literature has shown the link between different message characteristics and media influence such as the contextualization of political information (Jerit *et al* 2006, Schmitt-Beck 1998), episodic versus thematic coverage (Iyengar 1991), the overlap between media choice and partisanship among citizens (Kempen 2006), the dominance of balanced versus one-sided political coverage (Zaller 1992), the incidence of misleading information (Jerit and Barabas 2006),

[4] Knowledge gains associated with personal communication are unlikely to be higher than those associated with media exposure, given that most people's networks are neither very diverse not very distinct from themselves (Mutz and Martin 2005). Moreover, both the topics discussed and the extent to which discussion partners or opinion makers are themselves knowledgeable are very probably correlated with the type and amount of information (on the political actors) available in the mass media [REF]. The exceptions are possibly those few in direct contact with party sources/organizations, for which one can at least theoretically control for.

[5] Our argument about the relationship between the individual and aggregate-level relationships between media exposure and knowledge is similar to Nie *et al*'s (1996) discussion of the impact of education.

However, the rise of reality television showed that 'real things' – and thus maybe even politics – can be presented in an entertaining way too. It is not impossible to imagine that some citizens are better able to learn from infotainment than from an anti-sensationalist public broadcasting (cf. Baum 2003, Zaller 2003, Baum and Jamison 2006) although that claim is also disputed (Bennet 2003, Graber 2003; Patterson 2003). At a less extreme level, it is simply possible that commercial television provides the type and packaging of political programming that low-information citizens are more likely to be interested in and likely to learn from, as a study using the "natural experiment" of the introduction of commercial television in Sweden has shown (Prat and Stromberg 2006). The same mechanism may be at work as in the case of distinct patterns of comprehension and learning from newspapers and television observed for the less educated (Jerit *et al.* 2006, Kleijnijenhuis 1991). Indeed, Popescu and Toka's (2008) cross-national analysis found that at the aggregate level public television does not have the expected systematically positive impact on citizens' political competence – measured as the ability to emulate informed voting behaviour –, and speculated that the explanation for this result might be differences in terms of what public television means across Europe (Hallin and Mancini 2004, Holtz-Bacha and Norris 2001: 126, Kelly *et al* 2004, Iosifidis 2007). As television is not necessarily less informative than newspapers just because of technological format, public television (or publicly owned television) may not always have the desired and expected positive impact in buttressing an informed citizenry or not necessarily more so that commercial television.

All these points refer to the more general issue of how to understand and enrich pluralism or diversity, *i.e.* what form or what forms of diversity are more likely to be conducive to the desired goal of an informed citizenry. Concepts such as internal vs. external diversity (Hoffmann-Riem 1996, Voltmer 2000) or horizontal vs. vertical diversity (Napoli 1999), differentiate between the presence of distinct (political) viewpoints within individual media channels (internal or horizontal) or across media channels, in the (sub)media system at large. Press-party parallelism was first defined by Seymour-Ure (1974) as the degree to which the newspaper system parallels the party system; i.e., the political views of media outlets follow or are similar to the positions of the political parties. Recent research found that strong media-party parallelism is likely to have had a positive impact on political mobilisation over time (in Sweden) and cross-nationally (Van Kempen 2006, 2007). However, the same pattern may not occur with respect to political knowledge acquisition as partisan-tailored information may conceivably raise political mobilization without learning and leave citizens parts of somewhat different worlds of references, facts, and interpretations (Gandy 2001; Gitlin 1998; Mutz and Martin 2001). Such political bias was found to be less likely where media audience is heterogeneous, which acts more effectively than mere market competition in ensuring accuracy (Mullainathan and Shleifer 2005). Whatever is the cause of external diversity – press partisanship and the coincidence between regional media markets and geographically defined partisan strongholds are probably the most obvious candidates –, it raises the spectre that more information may not mean better information, but merely the encapsulation of citizens in a particular political camp and the provision of biased information.

Thus, the main question about pluralism is whether internal diversity (pluralism of opinions within each media outlet) is more valuable for information acquisition than mere outlet

diversity (media system fragmentation) possibly associated with external diversity (pluralism at the level of the media system). The question is of particular relevance for public service broadcasting, which by definition, has an obligation to provide sufficient amount of news and public affairs coverage, which is pluralist in terms of both issue content and coverage of political actors. It has to be accessible to a large spectrum of the society, not least in terms of socio-economic status and political orientations. These are the characteristics expected to contribute to an informed citizenry. The influence of public television on citizens' political knowledge may rather depend on its capacity to actually provide the public service content it is meant to. First, as a member of the Content Board of Ofcom said

> "By engaging with public value at the level of output you implicitly have to engage with it at the level of the architecture and, therefore, of the institution that makes it possible. To achieve PSB output, you need to set up an architecture which makes sure that when you spend money, you get the desired results." (Lilley 2008: 97)

Finding the 'architecture' that can ensure these goals is a complex matter - see for example the Ofcom commissioned analyses on pluralism in public broadcasting (Gardam and Levy 2008), the EUMAP reports on television regulation, policy and independence (EUMAP 2005 and 2008) or the World Bank's *Broadcasting, Voice, and Accountability* study (Buckley *et al* 2008). From the relevant institutional characteristics, the type of funding system is one of the main factors defining "public service broadcasters' ability to remain distinctive and competitive in the multimedia environment" (Iosifidis 2007: 56). In order to be able to function at the desired level of quality, professionalism and creativity, adequate public funding is deemed essential (Buckler *et al* 2008, Gardam and Levy 2008, Iosifidis 2007, for recent policy-oriented analyses). Such funding allows broadcasting organizations to focus on the quality of journalism and on their public service mission, therefore programming with more and better quality of public affairs information content. Since the cost of quality reporting, investigations and analysis, based on careful researching of facts and contextual details are particularly costly, a highly competitive environment is unlikely to allow sustaining such costs. It would also render impossible any innovative agenda, risky to fail the market test or any minority programming by nature unlikely to draw big audiences. Moreover, in a fully market based system, the target audience would be those favoured by advertisers rather than the mean or median voter/citizen (Hamilton 2004).

However, the mission of public service broadcasting may nevertheless be also endangered by it becoming a niche channel with a small (self-selected) audience of political and/or high culture buffs, very different from the citizenry at large. By being insulated from market pressures, it may lose touch with public needs and taste, not just of the least favoured but also of the average citizen. A possible response against these claims may be that even if few people watched public television, as long as it enjoyed internal diversity and set the quality standard, it could have spillover effects on other channels and on professional norms among journalists. Moreover, a politically independent public broadcaster may create the need for other (similar) broadcasters in the same market and thus limit the extent of political parallelism in the commercial broadcasting sector. However, political independence of public broadcasting itself may not be just a matter of regulation but also of journalistic role orientations, level of democracy, and by the political context, which has a formative

influence on political communication processes transmitted through all mass media (Gurevitch and Blumler 1990: 306). Expectations regarding the beneficial effects of public television must take into account widespread allegations about governmental abuse of public service media for partisan purposes in many of the world's democracies [ADD REF?]

2. Data and dependent variable

We examine how selected characteristics of mass media systems impact individual-level relationships between media exposure and citizen information. We use for this purpose a combination of aggregate information on press freedom and the programming content and financing of public television across time and space with individual-level mass survey data. The 1999 and 2004 European Election Studies (henceforth EES) provide the individual-level variables as well as some additional measures of media systems.[6] The EES conducts surveys with nationally representative samples of citizens in every member state of the European Union in the aftermath of the five-yearly elections to the European Parliament. We complement this source with aggregate time-series data provided by the European Audiovisual Observatory, Freedom House, the commercial organization Zenith Media and the World Bank to characterize the broadcasting media systems of European countries in 1999 and 2004. The resulting multilevel data set yields comparable measures of exposure to news programs on both public and private television as well as levels of political knowledge among more than 30,000 European citizens experiencing different media environments. Hence we can examine with it how the apparent impact of public and private television on citizens' political knowledge depends on macro-characteristics of broadcasting media.

Counting Belgium as two separate cases on account of its different political party and media systems in the Francophone and Flemish-speaking parts of the country, the European Union member states offer a total of 44 different country-years in 1999 and 2004. We managed to create a full data set for 35 of these.[7] These display a very considerable variation in media systems, including such classic reference points in scholarly discussions on systems of broadcasting as:
Ireland and the UK from among Hallin and Mancini's (2004) 'liberal' media systems dominated by market-driven competition;
the 'polarized pluralist' media systems of Southern Europe with their relatively undemanding arrangements for genuine public service broadcasting and high levels of media partisanship;
the 'democratic corporatist' systems of Sweden and Finland that display record-setting highs of press freedom but also very high levels of commitment to public service media; as well as

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[6] The 2004 EES data are publicly available through the www.europeanelectionstudies.net website and the 1999 data through a number of social science data archives.
[7] We had to drop from the analysis Malta (EU member since 2004), which did not participate in the EES study before 2009, Luxembourg (two country-years in 1999 and 2004) and Cyprus (member since 2004) for lack of some macro data on their mass media, plus Lithuania (member since 2004) and Belgium (one country-year each for the Francophone and Flemish-speaking parts) since their 2004 EES surveys did not carry our measures of political knowledge.

postcommunist Eastern Europe [ADD SOME CHARACTERIZATION OF POSTCOM MEDIA SYSTEMS].

The independent variables of our analysis shall be discussed in section three, while the remainder of the present section focuses on our dependent variable. *Political knowledge* is an individual-level measure of the ability to place parties on issue scales in a knowledgeable way (cf. Toka 2007, 2008). It sums up the 'truth values' of the respondents' placement of major political parties on ten-point left-right and pro- versus anti-European integration issue scales.[8] The estimation of truth values reckons that different respondents of equally high knowledge may place the same parties differently on the scales depending on their own political interpretation of the scale and its endpoints. Therefore, those aspects of the responses that may reveal more about political views than knowledge were disregarded in two ways.

First, the absolute placements of individual parties were replaced with relative placements involving pairs of parties. All responses regarding each pair were recoded into just four categories: (1) party A is to the left (or the more Euro-skeptic side) of party B; (2) party A is to the right (or more pro-integration side) of party B; (3) party A and party B have the same position; or (4) the respondent did not answer the question, or responded with a 'do not know'. Second, since party placements on issue scales are eminently disputable questions in everyday political discourse, the truth-value of each answer was conceptualized here as a matter of degree, revealed by the extent to which a maximally informed respondent was more likely to give that response than a maximally uninformed respondent. This difference can be estimated by regressing relative party placements on other available indicators of cognitive involvement in the EES surveys, which were: *"Thinking back to just before the elections to the European Parliament were held, how interested were you in the campaign for those elections: (1) very, (2) somewhat, (3) a little or (4) not at all?" "How often did you do any of the following things during the three or four weeks before the European election? How often did you …talk to friends or family about the election: (1) often, (2) sometimes. (3) never?" "To what extent would you say you are interested in politics: (1) very, (2) somewhat, (3) a little or (4) not at all?"* The multinomial logit analyses that were carried out for each pairwise comparison of parties on the two scales also included as control variables some socio-demographic characteristics listed in the Appendix of Toka 2007. These controls assure that the estimated truth values are not affected by the fact that the socio-demographic groups that are likely to score high on knowledge variables may share a particular political taste that impacts their perception of party positions.

The results of these multinomial regressions are of no substantive interest here. The relevant yield of these analyses were the predicted probabilities of each of the four response categories for two fictitious respondents: both exactly matching the national sample mean on the socio-demographic variables in the given year, but one showing the highest, and the other the lowest possible degree of cognitive involvement (i.e. frequency of political discussion, interest in politics in general and in the EP election campaign in particular). Then, the truth-value of each response category was determined as the difference between

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[8] The placements of small regional parties that were only available for small subsets of the British and Spanish samples were ignored.

its predicted probability for the maximally involved and the maximally uninvolved respondent.

This method of determining the relative truth-value of the responses allows for the possibility that 'do not know' or missing answers may not always represent less knowledge than some other responses do (cf. Mondak and Davis 2001; Mondak and Canache 2004; but see Luskin and Bullock 2005; Sturgis *et al* 2008), and that sometimes there are several equally good answers to the same party placement question. The method also gives a natural weighting of party pairs and scales for the building of the knowledge scale, and uses the same metric across the whole universe of between-party comparisons and response categories. Summing up the respective 'truth-value' of the individual responses across all pairwise comparisons available yields a very nearly normal distribution of scores across respondents within most national samples in the EES data set (data not shown). To fully standardize the distribution across the voting populations in the 35 country-years – which was necessary given that the sample mean and variance was dependent on the number of parties placed on the issue scales in each survey –, these scores were converted into normal scores constrained to fall in the 0 to 1 range, with a within-sample mean of .5 and standard deviation of approximately .16. This rescaling completed the construction of the individual level *Knowledge* variable.

3. Independent variables and modelling choices

Since *Knowledge* is set to have the same mean and variance within each national sample, we do not model the variance in its mean value across the 35 country-years. Instead, we are interested in the individual-level influence of exposure to news on public and private election on knowledge, and how these effects depend on the characteristics of the given media and media system. Hence the macro independent variables (observed at the level of country-years) are expected to impact *Political knowledge* in interaction with television exposure. The latter itself is measured with two individual-level variables, capturing the frequency of watching news programs on public and private television, respectively (for technical information about all independent variables see the Appendix).

Admittedly, the kind of cross-sectional data that we use is not ideally suited to exploring the causal influences of mass media on political knowledge. Media choice may not only influence on knowledge but be also influenced by individual characteristics that are more or less closely related to citizens' information level. While our data set is unusually rich for an analysis of the roots of cross-contextual variance in the relationship between knowledge on the one hand, and television exposure on the other, it does not allow us to control for all factors – such as cognitive ability or past political knowledge level – that may be shared causes of both. This limitation will have to be remembered while drawing inferences from the analysis. That said, we should emphasize though that experimental studies provide ample evidence that media exposure does lead to substantial learning effects when it provides information [INSERT REF]. Furthermore, our models will incorporate very robust controls for most of the well-known shared determinants of media exposure and knowledge. These include *Political interest* and *Partisanship* – i.e., the two political attitudes that are most commonly used as indicators of individual motivation to process political information

–; *Age*, *Age squared* and *Education* as the most important demographic determinants of an individual's ability to process, understand, contextualize, retain and recall political information; as well as the frequency of reading newspapers, which is the most widely available and demonstrably effective (cf. Guo and Moy 1998; Robinson and Levy 1996) alternative to television for learning about politics among citizens.

The choice of macro-variables that enter the analysis are motivated by the expectations discussed in section one as well as the variables that feature prominently in discussions about relevant variation across media systems. Blumler and Gurevitch (1995) suggest the following traits in particular:
1. degree of state control over mass media organizations;
2. degree of mass media partisanship;
3. degree of media-political elite integration;
4. the nature of the legitimating creed of media institutions.

Hallin and Mancini (2004), in turn, emphasize the following criteria of differentiation among media systems:
1. the development of media markets, especially the strong or weak development of a mass circulation press;
2. political parallelism, i.e. the degree and nature of the links between the media and political parties, or more broadly, the extent to which the media system reflects the major political divisions in society;
3. the development of journalistic professionalism; and
4. the degree and nature of state intervention in the media system.

The two sources clearly agree on the importance of press freedom (versus government interference) and political parallelism. We employ two different measures of each. Regarding the first, we sought a possible second option next to the commonly used Freedom House combined score of *Press Freedom*, because the variance of the latter across the European countries in our analysis is strongly influenced by the single notorious case of Italy. Given the laudable rarity of violence against journalists in the EU (that is measured by the yearly assessment of Reporters without Borders), our choice of an alternative measure with meaningful variance was heavily constrained. It eventually fell on one of the governance indicators estimated by the World Bank. This indicator is called *Voice and Accountability* and covers a domain that is broader than media freedom, but explicitly includes the latter and is presumably very strongly correlated with it. Our data source proposes its use to measure "the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, and a free media" (Kaufmann *et al* 2007: 3).

Our second set of macro-variables is intended to capture media political parallelism, i.e. the overlap between the audience/readership of individual media and the electorate of an individual party. Operationally, our measures are inspired by similar tools proposed by Hamilton (2004), Kempen (2006) and Popescu and Toka (2007), but replace them with newer ones in order to differentiate between external and internal diversity and, within the latter, between the internal diversity of public and private television programs.

The data for this come from the surveys of the European Election Study, which asked citizens both about what news programs they watch on television and their self-placement on a ten-point left-right scale that we standardized (i.e. set its sample standard deviation to unity for each country-year). We take the latter as a clear and reliable indication of the respondent's stance on whatever are the relevant ideological and party-political differences within their own country (cf. Brug *et al* 2009; Fuchs and Klingemann 1989; Knutsen 1997; Laponce 1981). For each news program mentioned by the respondents, we determined the distribution of standardized left-right self-placements among its viewers. *Political parallelism* is calculated as the standard deviation, across all news programs, of the mean left-right location of viewers. The higher the value of *Political Parallelism*, the more ideologically distant the average viewer of one news program is from the average viewer of another, relative to how widely spread citizens generally are in left-right terms. We take this value as our proxy for the external diversity of news programs within a given country.

Political parallelism could be calculated separately for private and public media within the same country, but this would not make too much substantive sense as in many instance these measures would only show if the viewers of the early evening news differ from the viewers of the late night news on the same channel. However, we can construct separate proxies for the internal diversity of the average program on private and on public television channels in the given country. *Public tv audience diversity* and *Commercial tv audience diversity* show the audience-weighted average of the standard deviations of left-right self-placements among the viewers of each news program within the two sectors. Because this variable construction uses left-right standardized placements, these scores always show the ideological heterogeneity of the audience of the average news program of the sector in question relative to the country's population as a whole, with high values suggesting particularly heterogeneous audiences, suggestive of the given programs' ability to attract viewers from both ends of the political spectrum.

The data on the percentage of news and information programming available on public television as well as on the funding of public television (percentage of total funding covered by public funding and by licence fee, respectively) for the relevant years were compiled by the authors from the various issues of the *European Audiovisual Observatory Yearbook*. Apart from data on public funding, aimed to capture the (in)dependence of public television from advertising/commercial revenues, we also use data for funding from licence fee. The latter is considered as the type of funding that best contributes to achieving public service objectives (Iosifidis 2007: 56 citing McKinsey&Company 1999) because it limits financial dependence from government and permits long-term planning and thus better quality, more diverse and innovative programming. Ideally, we would like to tap into the same aspects through a measure of the extent to which public funding is deemed sufficient. The amount of licence fee paid by the citizen/household is not an appropriate measure since costs differ across countries. Some measure of the extent to which public television breaks even at the end of the year or has losses can be a starting point, but the comparative relevance of that data may also depend on the organizational and programming strategy, which would have to be taken into account to produce a valid cross-national measure starting from budget balance.

- Table 1 and Table 2 about here -

To facilitate comparisons between their influences on knowledge, we applied a linear transformation to all our independent variables such that their observed minimum value always equals zero and their observed maximum equals one (cf. Table 1). Table 2 presents the pairwise correlations between the macro variables across the 35 country-years in the analysis. The two measures of media freedom, i.e. *Press freedom* and *Voice and Accountability*, show a relatively strong though not at all overwhelming correlation between them – note that the correlation is positive because we reversed the Freedom House scale so that high values mean more freedom –, as do the two financial measures, *Public funding* and *Licence fee.* Figures 5 and 6 give further information about the country-years for which it does make a substantial difference which measures are used for media freedom and the financial insulation of public broadcasting from pressures towards commercialization. Note in particular how far Italy as of 2004 (IT04) falls from the main diagonal in Figure 5 because it matches a very low *Press freedom* score with a merely mediocre *Voice & accountability*, while some Eastern and Central European countries (Latvia, the Czech Republic, Slovakia, Estonia, Poland and Slovenia) as well as Flanders have rather high *Press freedom* for their level of *Voice & accountability*. Rather than averaging scores across two conceptually similar measures, we decided to replicate all analyses with both measures in each pair to detect any sensitivity of our results to mundane issues of indicator selection.

- Figure 5 and Figure 6 about here -

Returning to Table 2, the funding system and the media freedom variables are also positively correlated with each other, with freer countries making public broadcasting less dependent on commercial revenue. However, this tendency is not very strong and its statistical significance only reaches borderline values at most. Quite logically, a high incidence of news and information programs on public television goes together with less dependence on commercial revenue and with higher values of *Voice & Accountability* in the country. *Political parallelism* is negatively correlated with both the press freedom and the public funding variables. This is reminiscent of the place of 'polarized pluralism' in Hallin and Mancini's (2004) typology of media systems. As can be seen in Figure 7, all media systems on the high end of press-party parallelism – i.e. a score of 0.5 on *Political parallelism* – have, with the exception of Belgium and Greece, a modest public contribution to the revenue basis of public television, and all except for Belgium have low to mediocre levels of press freedom in an EU-wide comparison. Italy stands out again as the most extreme example of a country where modest press freedom and intermediate levels of public funding combine with high political parallelism.

Last but not least, note that the measures of internal news program diversity in the public and private sector vary quite independently of all the other dimensions, except for a weak positive correlation between *Commercial tv audience diversity* and the funding and programming characteristics of public television. Even more interestingly, the internal diversity of public and private sector programs are also quite independent of each other,

with several countries (highlighted in Figure 8) combining much higher values on one than the other.

- Figure 7 and Figure 8 about here -

4. Empirical analysis

The multivariate statistical analyses reported below were carried out with the HLM6 software of Raudenbush *et al* (2004), using hierarchical linear regression models. All individual-level (also called level-1) variables were centred at their country means when they entered the multilevel models. All macro-variables entering the analysis were centred at their grand mean in the pooled cross-national sample, and all national samples were given equal weight in the analysis. Except when explicitly noted below, all individual-level variables appeared to have a statistically significant variance in their effects across the 35 country-years in the analysis, and were therefore set to have random effects.

- Tables 3.a to Table 4.c about here -

Tables 3.a to 4.c report the most important ones of the various model specifications that we tried. Before reading the tables in detail, note that Model 1 is our baseline model that only includes level-1 variables, and that the various parameter estimates for this and all other models are spread across three pages. The results for Model 1, for instance, appear in the leftmost columns of Tables 3.a, 3.b, and 3.c. Table 3.a reports the so-called fixed effects of the level-1 variables on political knowledge under the different models. Somewhat causally speaking these can be conceived as averages of how the various variables influence political knowledge within the individual country-years. Table 3.b, in turn, reports the estimated standard deviation of the same effects across the 35 country-years. Since Model 1 does not include any cross-level interactions, the leftmost column of Table 3.c remains empty. Notice too that the subsequent models 2.a to 3.d do not alter the level-1 model of the baseline specification at all, just add cross-level interactions to it. These cross-level interactions constitute our explicit attempts at understanding why the impact of public and private television exposure may vary across country-years.

Consider now the way our baseline model is specified. The goal here is to obtain as precise an estimate as possible of how exposure to television news on public and private channels influences political knowledge differences between viewers and non-viewers. Therefore we set up a model that controls for all possible shared determinants of knowledge and exposure that we could get a handle on. These include partisanship, political interest, education, age, age-squared and newspaper reading. All these control variables appear to influence knowledge statistically significantly and in the expected direction. That is to say, citizens with higher education, stronger partisanship, greater interest in politics, and greater frequency of reading papers are more likely to display high levels of knowledge than others. Age has a positive and age-squared a negative effect, confirming that political knowledge

increases with age but only up to a point, beyond which it starts declining as people get older.

Our first key question is whether television exposure has any effect on knowledge once we control for the above individual characteristics. This question is answered by a relatively clear yes both in the case of public and private television exposure. Given that all variables run from 0 to 1, Table 3.a readily reveals that changing ones exposure to news on public television from the minimum to the maximum value is associated with a 0.028 (plus-minus 0.016) point increase in knowledge level. This is slightly but not statistically significantly different from the comparable effect of private television exposure, which is 0.019 (plus-minus 0.012) points. Both effects are positive but obviously dwarfed by the significantly bigger (0.109 and 0.158 point) effects of education and political interest.

A longer note is due about the interactions between interest in politics and the two television exposure variables in our baseline model. The rationale for their inclusion goes back to Luskin's (1990) proposition that motivation, opportunity and capability act in combination with each other: the more interested and more sophisticated citizens can learn more from the same exposure to new information than less motivated and less sophisticated message recipients. If so, then supporters of public involvement in broadcasting are probably wrong in believing that public information can be effectively disseminated by subsidizing and coercing channels to broadcast what people are simply not so much interested in that commercial television would also give it airtime.

In fact, however, we find negative interaction effects between exposure and interest instead of the positive ones expected, and these nearly perfectly match in size the main effects of the respective television exposure variables.[9] That is to say, the most politically interested citizens seem to learn about politics whether or not they attend to political news, probably because they actively seek out information through other channels, not the least the newspapers. It is only for the less interested for whom the encounter with political information on television really matters (for not entirely dissimilar findings from the US, see Jerit *et al* 2006). This finding would seem to support a core assumption behind public broadcasting, namely that it would actually make some difference if people were provided a programming that is richer in information than the kind of programming that market demand for television programs themselves would generate in the absence of publicly funded and regulated broadcasters.

A further interesting finding about the two interaction effects is that they are nearly constant across contexts. As Tables 3.b and 4.b show, the effects of all other individual level-variables vary highly significantly across the 35 country-years in the analysis. However,

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[9] In tests not reported in the tables we found that adding interactions between interest in politics and the media exposure variables marginally improved model fit. When these interaction effects were not part of the model, the main effects of public television exposure, private television exposure and newspaper reading were still positive and significant. This did not change when the interactions were added, but the interactions of these exposure variables with interest had, however, a consistently negative effect on knowledge. The effect was only significant – either statistically or substantially – for the two measures of television exposure though, and that is why our baseline model features these two interaction terms but not the one between interest and newspaper-reading. For very similar previous findings see Kwak (1999).

when we also allow the *Ptv exposure*Political interest* and the *Ctv exposure*Political interest* interaction terms to have varying effects across contexts, the statistical significance of these variance components remains well above acceptable levels (data not shown). Therefore our models treat these interaction effects as fixed across the country-years.

As Table 3.b witness, the main effects of the two television exposure variables do however vary significantly across contexts under all the models. Under Model 1, the standard deviance of this variance component is 0.23 for public television and 0.15 for private television – somewhat smaller than the respective fixed effects (0.28 and 0.19) of the same variables seen in Table 3.a. Given that the variance component was estimated under the assumption of its normal distribution, the ratios of the variance components to the fixed effects imply that in something about a tenth of the contexts we may in fact expect to see negative effects of one or the other television exposure variable on political knowledge, while in a similarly large number of contexts we may expect the observed positive effects to grow twice or more bigger than the average. Our ultimate task here is to see whether the macro-variables about mass media may help us explain at least a part of this cross-contextual variation.

To this effect, we added interactions between media-characteristics and the two television exposure variables to the baseline model. Models 2.a to 2.g only interact one macro-variable with either *Public tv exposure* or *Commercial tv exposure* at a time. Models 3.a and 3.d, in contrast, let both level-1 variables interact with the full set of concepts operationalized through our macro-variables. As explained in section three, we never enter *Voice & Accountability* and *Press freedom* simultaneously in the models because they are expected to capture much the same factor. Similarly, *Public funding* and *Licence fee* also enter the models only separately. Through Models 3.a to 3.d, however, we present all possible permutations of these two pairs of variables in the models.

The results regarding the cross-level interactions are displayed in Tables 3.c and 4.c. When only one macro concept enters the analysis at a time, they all seem to record a significant effect on how public television exposure relates to political knowledge across different country-years. Greater media freedom and audience diversity, lesser political parallelism, a greater share of public funding in the budget of public television, and more information and news content on public television all appear to increase the educational effect of public television news on their viewers.[10] The effects on the educational potential of private television consistently run in the opposite direction and are also significant at least for media freedom and political parallelism. That only these interactions are clearly significant for private television is hardly surprising though, since three of the four remaining macro variables are related specifically to how public television operates in a given country.

When all macro concepts enter the analysis simultaneously, only three of them still record a significant impact on the educational effect of television news (see Table 4.c). Press

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[10] Technically speaking, we cannot in fact tell whether the educational effects increase on the viewers or rather the knowledge level of the non-viewers drop as the macro variables change their value in the way indicated in the text. However, the latter possibility looks implausible on substantive grounds –we simply cannot see what social mechanism could generate such effects – and therefore our discussion ignores it.

freedom still seems to increase the positive effect of public television news, but not significantly so. It does, however, appear to reduce the educational effect of commercial television, independently of whether we use the *Press freedom* or the *Voice & Accountability* variable. In fact, press freedom is the only remaining significant influence on the educational effect of commercial television.

The effects of *Political parallelism* become mostly quite weak, always insignificant, and even a bit inconsistent across Models 3.a to 3.d. In contrast, the political heterogeneity of public television news audiences records a rather large and clearly significant positive effect on the educational effect of public television news. Across the four model specifications reported in Table 3.c, this interactive effect hovers around 0.062, which is more than twice the 0.028 main effect of public television exposure shown in Table 3.a. In other words, at the maximum observed level of *Public tv audience diversity* – which should signal lack of political bias on public television and possibly also on its competitors – we expect over three times bigger positive effects of public television news exposure on viewers' knowledge than at the minimum level of audience diversity. That minimum level, in turn, ought to denote rather significant political bias on public television news programs, but at least in the colour of the audience that they cater for.

Not quite so large, but still very significant is the effect of programming on the educational effect of public television. We estimate that this effect is anywhere between 0.026 to 0.045, or roughly 100 or even 150 percent of the main effect, as we move from the observed minimum of news and information programs on public television to its observed maximum. Public funding, in turn, appears to have no effect on how much viewers learn from public television news. We should recognize, however, that the funding system is positively correlated with information content (cf. Table 2). It should be merely as intended by law-makers if, as our analysis suggests, the impact of public funding on the educational effect of public television materializes indirectly, namely through the kind of programming content that publicly funded channels can afford and/or are requested to provide. At the same time, the results obtained with Models 3.a to 3.d confirm again that public television characteristics do not impact the educational effect of commercial television. This is theoretically significant since it would seem to refute the otherwise plausible idea that more public funding for – and more news and information content on – public television leads private broadcasters to abandon the media market segment for public information to their publicly subsidized competitor.

5. Conclusions

We sought both methodological and conceptual innovation with this paper. Most previous research about media effects on political knowledge looked at a single national context. This creates difficulties in assessing how systemic properties of media systems impact observations about the impact of different media on citizen knowledge. Cross-national comparative analyses are much better suited to address this question. However, so far they have either looked at a small number of very affluent societies (cf. Curran *et al* 2008; Iyengar *et al* 2008 as well as a number of contributions to the present workshop), or only

aimed at establishing broad cross-national similarities, such as the correlation of political knowledge with media exposure and a declared preference for public over private television (Holtz-Bacha and Norris 2001). In contrast, our research design permits multivariate statistical analyses of why watching news on public versus private television or not watching at all are differently related to political knowledge in different media environments across a relatively heterogeneous set of countries.

The higher number of media contexts in the present study facilitated a conceptually different look at how media characteristics impact citizen knowledge. Our theoretical expectations build on previous efforts at classifying media systems by Blumler and Gurevitch (1995) and Hallin and Mancini (2004), but we did not seek a comprehensive assessment of entire constellations of media systems. Instead we analysed the impact of specific variables like press freedom or the amount of public funding for public television. Each such macro variable is seen as a criterion that takes the form of a continuum rather than a way of categorizing media systems and although there are some interrelations between the criteria, they neither overlap nor define a type in conjunction.[11] This is an important distinction from the Hallin and Mancini (2004) method and allows media traits to be more precisely understood in terms of specific criteria. We consider this vital for analyses of the impact of media rather than its dependence on the political system, which motivated Hallin and Mancini's construction of comprehensive ideal types that do not easily mould on the empirical reality, especially when looking beyond the countries for which the theory/typology was designed.[12] The same move from the assignment of countries to broad ideal types to the explicit quantification of specific media system characteristics also facilitates the look at media system characteristics that often feature prominently in debates among policy makers and academics about the merits of different media systems, and are conceivably open to regulation and reform in the name of the public interest.

Our research design nevertheless permitted an acknowledgement of the key advantage of comprehensive typologies. The latter recognize, at least potentially, that no single characteristic of the media system represents a sufficient or necessary condition in itself for the occurrence of (stronger or weaker, positive or negative) media effects on knowledge. Certain media system features, like the strong presence of public broadcasting or high press-party parallelism, may contribute to an information environment more conducive to knowledge acquisition for certain citizens in some political contexts but not necessarily for other groups or in other contexts. However, this does not mean that their (content related) functions cannot be fulfilled through other media system elements in a distinct social or political context. What works in one media system or political context may not work in all. We agree that the heterogeneity of the audience and of political contexts, as well as their interactions with the media system need to be part of the picture. While the present paper makes only a small first step in introducing such complex interactions, our data and research design can and should be used to explore more fully this issue in the future.

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[11] In this sense, our approach is more similar to the one taken by Blumler and Gurevitch than that of Hallin and Mancini.

[12] The fact that one country can fall in two cells of the Hallin and Mancini typology leads Norris and Inglehart (2007) to reject its use in their paper.

Substantively, we find that exposure to public and commercial television news both tend to increase political knowledge, but to a very different extent in different contexts, and only for citizens of low or moderate interest in politics. We suspect that the highly interested keep up with political information in other ways even when they do not attend to television news particularly frequently, and that the positive effects of exposure on the uninterested may support a presumption underlying public service broadcasting itself. For the less interested viewers, however, the positive effect of either public or private television news on knowledge is basically as large as that of newspaper-reading.

Interestingly, the apparent political education effects of television news are so varied in size across contexts that we expect them to be nil or possibly even negative in some EU member states, and be so large on the other extreme that they may almost reach the 0.109 effect of education. We also find that the degree of internal diversity (lack of political bias) on public television strongly influences how much people learn from public television news, and these news programs also become more educative when public television channels have a strong focus on providing news and information content. The positive effect of commercial television news on citizen knowledge, in its turn, increases as press freedom drops. We speculate that this latter finding may be related to a drop in the credibility and reliability of public television where governmental interference in mass media is high, and drives willing political learners away from public television news and towards the news programs of commercial channels. However, at this point we can do little to further investigate this explanation.

While our discussion above presumed that we observed in this analyses actual causal effects of television news exposure on knowledge, we wish to recognize that an alternative interpretation stressing selective exposure is also possible. While we did try to control for possible shared determinants of political knowledge and news exposure, our list of control variables falls short of exhausting the theoretical possibilities. Of course, a lack of control for some unobserved confounding factor is an ever possible counter to any empirical inquiry. Yet in this particular case we are particularly concerned that a control for prior levels of political knowledge or indeed cognitive ability may alter the findings presented here. We should point out though that this would not make the findings reported in this paper entirely worthless. It is just that then they would suggest that citizens of greater prior political knowledge or cognitive ability appear to become more likely to turn to public television news when that becomes less politically biased, and appears on a channel more strongly committed to news and information content. Likewise, informed citizens may turn to news programs on commercial channels when press freedom drops. Be that as it may, it seems hard to understand why such behaviour would occur among citizens of above average knowledge and cognitive ability if it were not actually conducive for further information gains among them. Therefore, we feel reasonably confident that in spite of the possibly imperfect controls for selective exposure achieved in this paper it is nevertheless correct in identifying some of the conditions under which television news is more likely to assist knowledge gains among citizens.

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Appendix: Variables in the analysis

Individual level (level-1) variables:

Political knowledge: see section 2 for a full discussion.

Political interest: recoded responses to the following EES questions: "To what extent would you say you are interested in politics? Are you very interested, somewhat interested, a little interested or not at all interested?" The initial coding (afterwards rescaled to run from 0 to 1) was 1=not at all, 2=little, 3=somewhat, 4=very.

Partisanship: recoded responses to the following EES questions: "Do you consider yourself to be close to any particular party? [yes or no] …[If yes:] Do you feel yourself to be very close to this party, fairly close, or merely a sympathiser?" The initial coding (afterwards rescaled to run from 0 to 1) was 1=no, 2=sympathiser, 3=fairly close, 4=very close.

Age: the respondents' age in years, rescaled to run from 0 to 1.

Age squared: the squared value of age.

Education: school leaving age in years, with values above 26 initially recoded to 26. Rescaled to run from 0 to 1.

Public tv exposure: recoded responses to the following EES questions: "How many days of the week do you watch the news on television?" The recoding proceeded in multiple steps. First, news programs and channels mentioned at the follow-up question ("Which channels or television news programs do you watch regularly?") were recoded into (programs on) public, private and other (foreign, local, or unclassifiable) channels by the authors. The Commercial tv exposure score of the respondents equal their reported frequency of watching television if they mentioned at least one private television channel. Otherwise they were assigned a score of zero or a missing value if no information was available about their program/channel choice. The initial codes were then rescaled to run from 0 to 1.

Commercial tv exposure: recoded responses to the following EES questions: "How many days of the week do you watch the news on television?" The recoding proceeded in multiple steps. First, news programs and channels mentioned at the follow-up question ("Which channels or television news programs do you watch regularly?") were recoded into (programs on) public, private and other (foreign, local, or unclassifiable) channels by the authors. The Commercial tv exposure score of the respondents equal their reported frequency of watching television if they mentioned at least one private television channel. Otherwise they were assigned a score of zero or a missing value if no information was available about their program/channel choice. The initial codes were then rescaled to run from 0 to 1.

Paper-reading: responses to the following EES questions: "How many days of the week do you read a newspaper?" Rescaled to run from 0 to 1.

Macro (level-2) variables:

Voice & Accountability: one of the six governance indicators provided by Kaufmann *et al.* (2007). Missing values for the year 1999 were imputed as the average of the estimates for the same country in 1998 and 2000. Rescaled to run from 0 to 1.

Press freedom: the inverse of the combined score for press freedom as reported by the Freedom House organization via http://www.freedomhouse.org. Rescaled to run from 0 to 1.

Political parallelism: a proxy for the external diversity of television news programs in the given country. Calculated as the audience-weighted standard deviation, across all news programs/channels, of the mean left-right location of viewers on a ten-point left-right scale in the European Election Study. The original responses to the left-right scale were standardized to have unit variance within each country-year before program/channel averages were calculated. Rescaled to run from 0 to 1.

Ptv audience diversity: a proxy for the diversity of political views appearing in a news program/television channel. Calculated as the audience-weighted average, across all public television news programs/channels, of the standard deviation of the left-right location of viewers on a ten-point left-right scale in the European Election Study. The original responses to the left-right scale were standardized to have unit variance within each country-year before within-program/channel variances were calculated. Rescaled to run from 0 to 1.

Licence fee: the percentage share of income from licence fees in total revenue among public television channels in the given country-year. Compiled by the authors from the various issues of the European Audiovisual Observatory Yearbook. Rescaled to run from 0 to 1.

Public funding: the percentage share of income from public funding (including licence fee income) in total revenue among public television channels in the given country-year. Compiled by the authors from the various issues of the European Audiovisual Observatory Yearbook. Rescaled to run from 0 to 1.

Info programs: the percentage share of news and information programs in total broadcasting time on public television channels in the given country-year. Compiled by the authors from the various issues of the European Audiovisual Observatory Yearbook. Rescaled to run from 0 to 1.

Figure 1 A simplified model of contextual determinants of political knowledge

POLITICAL KNOWLEDGE

Message content Citizen characteristics

INFORMATION ENVIRONMENT

MEDIA CHARACTERISTICS

Journalistic Ownership& Media
culture competition structures partisanship

POLITICAL CONTEXT

Democratic Party Party System
Status Characteristics
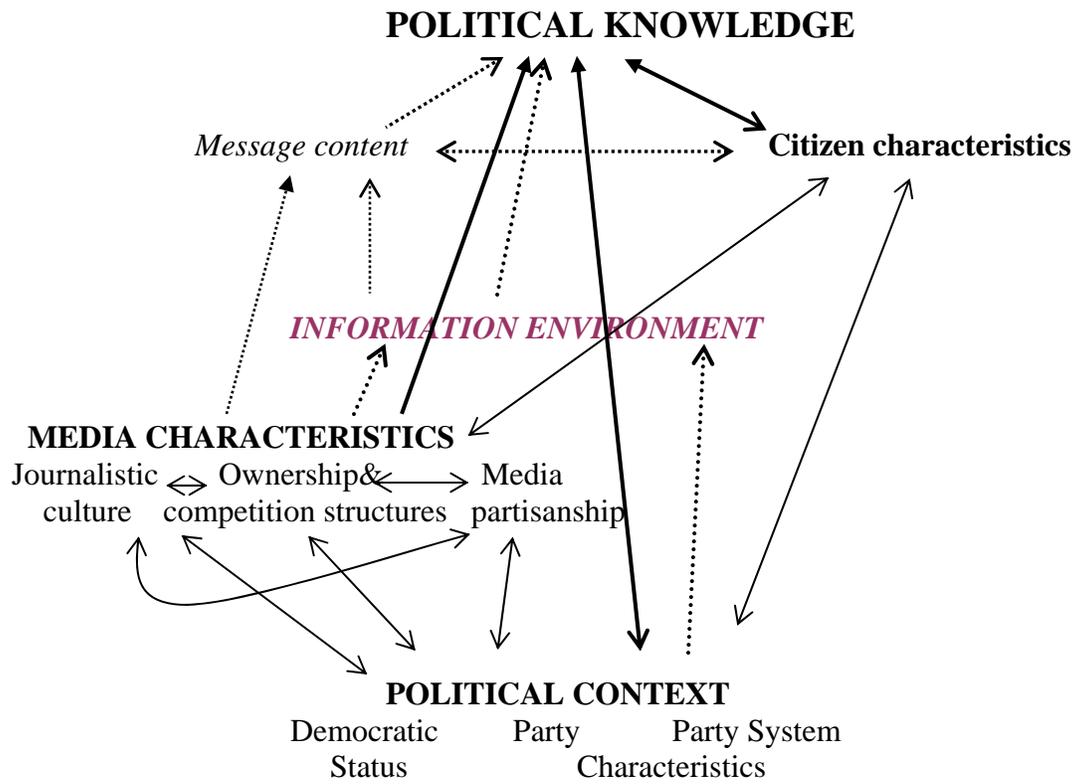
Figure 2. **A further simplified model of contextual determinants of political knowledge**

POLITICAL KNOWLEDGE

Message content

CITIZEN CHARACTERISTICS

Capability   Motivation

MEDIA CHARACTERISTICS

Competition Journalistic Ownership Media
structure   culture   structure   partisanship

POLITICAL CONTEXT

Democratic   Party   Party System
Status   Characteristics   Characteristics
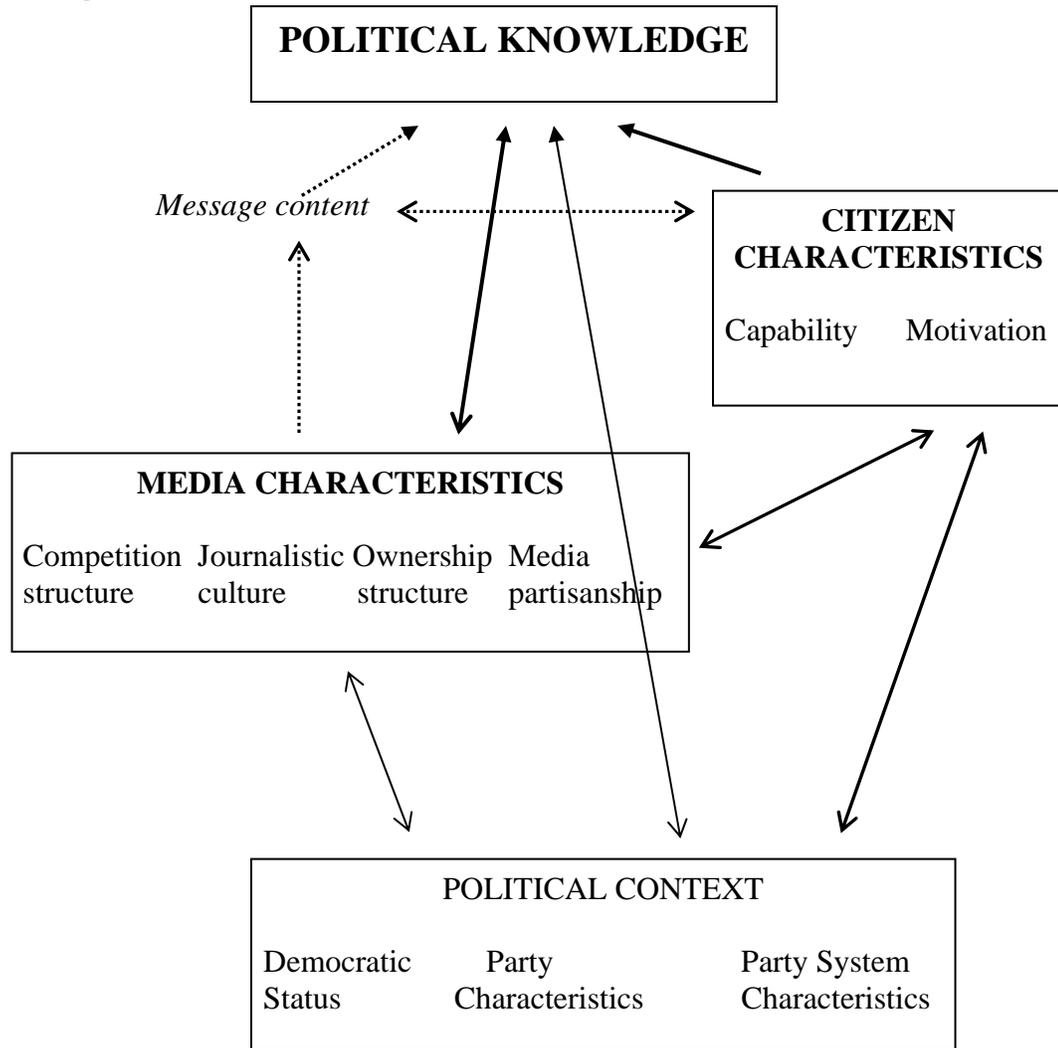
Figure 3 Empirical model of contextual determinants of political knowledge

POLITICAL KNOWLEDGE

Citizen characteristics

INFORMATION ENVIRONMENT

MEDIA CHARACTERISTICS

Newspaper   Competit   PubServTV   Media
readership   structureTV   partisanship

POLITICAL CONTEXT
Democratic   Party
Status   Characteristics
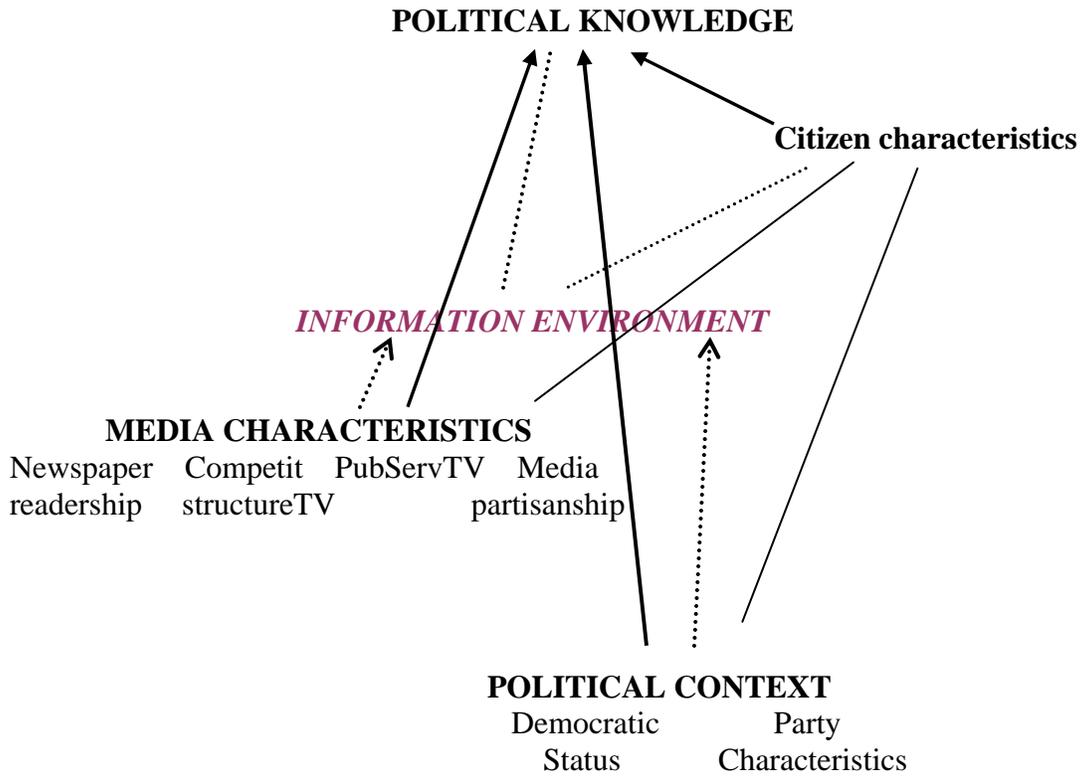
Figure 4. **The simplified empirical model of contextual determinants of political knowledge**

POLITICAL KNOWLEDGE

CITIZEN CHARACTERISTICS

Capability   Motivation

MEDIA CHARACTERISTICS

Newspaper   Competition   Public   Media
readership   structureTV   serviceTV   partisanship

POLITICAL CONTEXT

Democratic   Party
Status   Characteristics
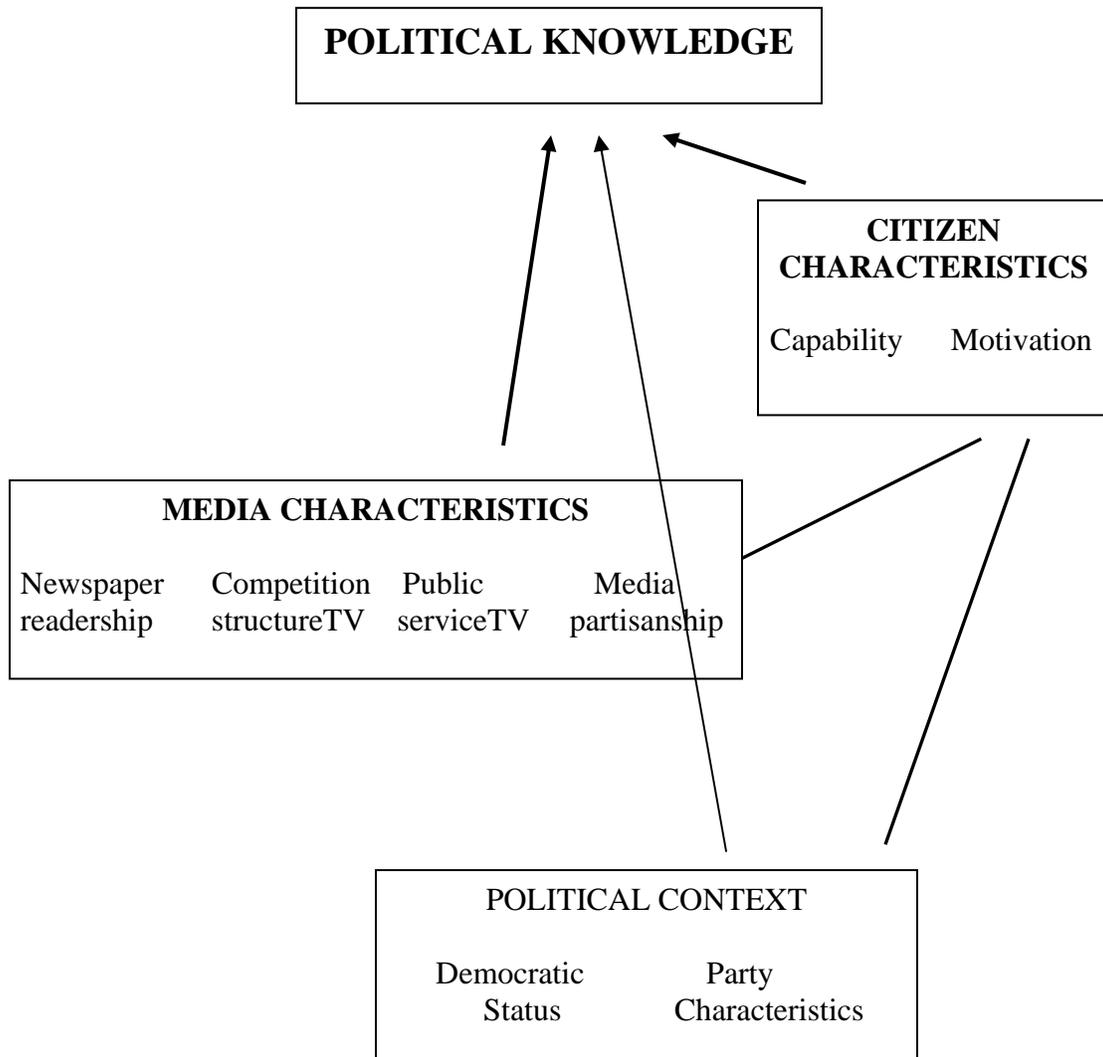
Table 1: Descriptive statistics about the variables in the analysis

	Minimum	Maximum	Mean	Std. dev.
Level-1 variables (N=29029 respondents)				
Political knowledge	0.00	1.00	0.51	0.15
Political interest	0.00	1.00	0.49	0.29
Partisanship	0.00	1.00	0.32	0.32
Age	0.00	1.00	0.38	0.19
Age-squared	0.00	1.00	0.23	0.16
Education	0.00	1.00	0.66	0.20
Public tv exposure	0.00	1.00	0.58	0.43
Commercial tv exposure	0.00	1.00	0.50	0.45
Paper-reading	0.00	1.00	0.57	0.39
Level-2 variables (N=35 country-years)				
Voice & Accountability	0.00	1.00	0.56	0.23
Press freedom	0.00	1.00	0.67	0.25
Political parallelism	0.00	1.00	0.44	0.26
Public tv audience diversity	0.00	1.00	0.70	0.15
Commercial tv audience diversity	0.00	1.00	0.70	0.19
Licence fee	0.00	1.00	0.59	0.30
Public funding	0.00	1.00	0.64	0.26
Info programs	0.00	1.00	0.42	0.27

Table 2: Correlation matrix of level-2 variables (N=35)

	Voice & Acc.	Press freedom	Pol. Parallel.	Ptv aud. diversity	Ctv aud. diversity	Lic fee	Public funding	Info progs.
Voice & Accountability	1.00							
Press freedom	0.63***	1.00						
Political parallelism	-0.50***	-0.50***	1.00					
Public tv audience Diversity	0.05	-0.01	-0.20	1.00				
Commercial tv audience div.	0.01	-0.01	-0.19	0.21	1.00			
Licence fee	0.47***	0.27	-0.36**	-0.10	0.30*	1.00		
Public funding	0.28*	0.30*	-0.46***	-0.07	0.41**	0.73***	1.00	
Info programs	0.42**	0.18	-0.29	0.26	0.41**	0.52***	0.61***	1.00

Figure 5: A comparison of Press freedom to Voice & Accountability
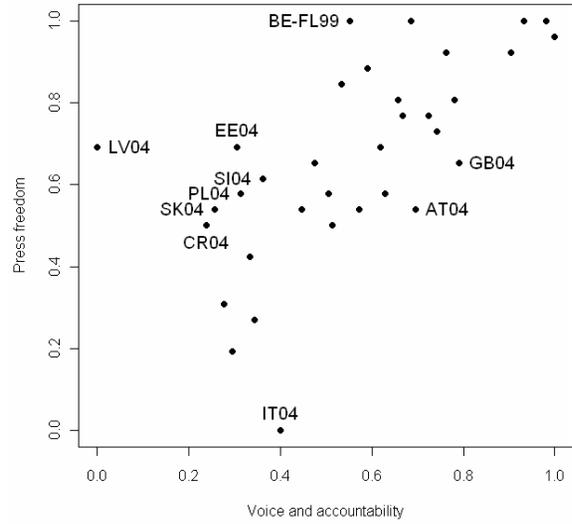

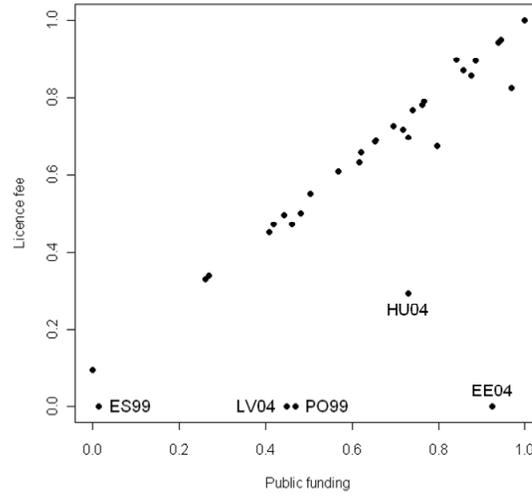**Figure 6: The share of public funding and licence fee income in public television expenditure**

Figure 7: Political parallelism scores by
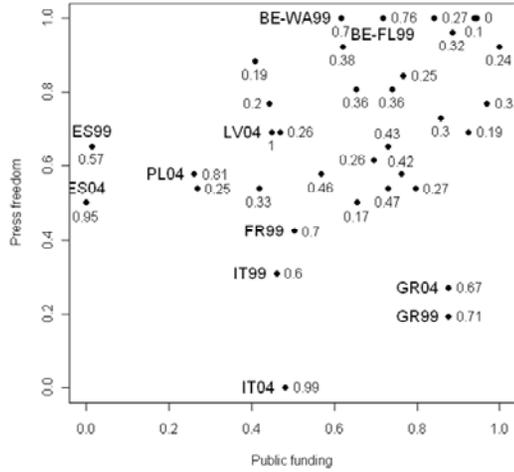Press freedom and Public Funding

Figure 8: Proxies for internal news program
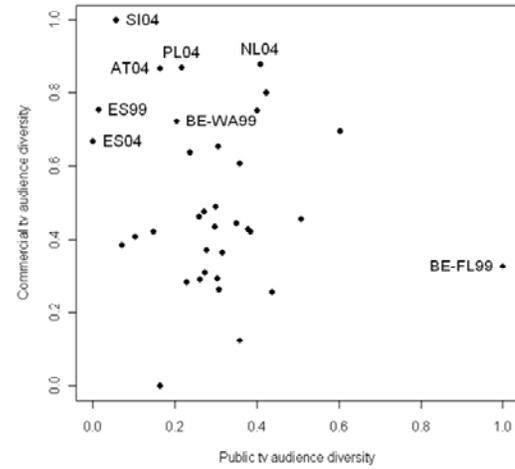diversity on public and private television

Table 3.a: Effects of level-1 variables on political knowledge in Models 1-2.g (regression coefficients with standard errors in parentheses)

Model:	1	2.a	2.b	2.c	2.d	2.e	2.f	2.g
Intercept	0.504***	0.504***	0.504***	0.504***	0.504***	0.504***	0.504***	0.504***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Political interest	0.158***	0.157***	0.157***	0.157***	0.157***	0.158***	0.158***	0.158***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Partisanship	0.03***	0.03***	0.03***	0.029***	0.03***	0.029***	0.03***	0.03***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Age	0.168***	0.167***	0.165***	0.168***	0.169***	0.168***	0.168***	0.17***
	(0.049)	(0.048)	(0.048)	(0.049)	(0.047)	(0.048)	(0.048)	(0.048)
Age squared	-0.254***	-0.254***	-0.251***	-0.254***	-0.255***	-0.256***	-0.255***	-0.257***
	(0.056)	(0.055)	(0.056)	(0.057)	(0.055)	(0.055)	(0.056)	(0.056)
Education	0.109***	0.109***	0.108***	0.109***	0.109***	0.108***	0.108***	0.108***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.008)	(0.009)	(0.009)
P[ublic]tv exposure	0.028***	0.028***	0.027***	0.027***	0.028***	0.028***	0.027***	0.028***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.006)	(0.008)	(0.008)	(0.008)
Ptv exposure*Political interest	-0.021***	-0.02***	-0.02***	-0.02***	-0.021***	-0.022***	-0.021***	-0.022***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
C[ommercial]tv exposure	0.019***	0.019***	0.019***	0.019***	0.018***	0.019***	0.019***	0.019***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Ctv exposure*Political interest	-0.024***	-0.024***	-0.024***	-0.023***	-0.023***	-0.024***	-0.023***	-0.023***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Paper-reading	0.021**	0.021**	0.021**	0.021**	0.021**	0.021**	0.021**	0.021**
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
-2 log likelihood	-34876	-34870.7	-34866.8	-34866.1	-34872.2	-34867.6	-34865.4	-34875

***: p<.01; **: p<.05; *: p<.1

See notes to Table 4.c.

Table 3.b: Standard deviation of level-1 effects across level-2 cases in Models 1-2.g

Model:	1	2.a	2.b	2.c	2.d	2.e	2.f	2.g
Intercept	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***
Political interest	0.049***	0.049***	0.049***	0.049***	0.049***	0.05***	0.05***	0.05***
Partisanship	0.029***	0.03***	0.029***	0.03***	0.03***	0.03***	0.029***	0.029***
Age	0.198***	0.195***	0.197***	0.198***	0.193***	0.194***	0.197***	0.198***
Age squared	0.225***	0.221***	0.225***	0.226***	0.218***	0.219***	0.224***	0.224***
Education	0.034***	0.034***	0.035***	0.035***	0.035***	0.034***	0.034***	0.035***
P[ublic]tv exposure	0.023***	0.022***	0.022***	0.023***	0.019***	0.021***	0.023***	0.022***
C[ommercial]tv exposure	0.015***	0.013***	0.014***	0.014***	0.015***	0.015***	0.015***	0.015***
Paper-reading	0.034***	0.034***	0.034***	0.034***	0.033***	0.035***	0.034***	0.034***
-2 log likelihood	-34876	-34870.7	-34866.8	-34866.1	-34872.2	-34867.6	-34865.4	-34875

***: $p<.01$; **: $p<.05$; *: $p<.1$

See notes to Table 4.c.

Table 3.c: Cross-level interactions among the determinants of political knowledge in Models 1-2.g

Model:	1	2.a	2.b	2.c	2.d	2.e	2.f	2.g
Ptv exposure*Voice & Acc.	-	0.039***	-	-	-	-	-	-
	-	(0.011)	-	-	-	-	-	-
Ptv exposure*Press freedom	-	-	0.029**	-	-	-	-	-
	-	-	(0.011)	-	-	-	-	-
Ptv exposure*Political parallelism	-	-	-	-0.034***	-	-	-	-
	-	-	-	(0.012)	-	-	-	-
Ptv exposure*Ptv audience diversity	-	-	-	-	0.087***	-	-	-
	-	-	-	-	(0.02)	-	-	-
Ptv exposure*Licence fee	-	-	-	-	-	0.034***	-	-
	-	-	-	-	-	(0.012)	-	-
Ptv exposure*Public funding	-	-	-	-	-	-	0.028**	-
	-	-	-	-	-	-	(0.011)	-
Ptv exposure*Info programs	-	-	-	-	-	-	-	0.046***
	-	-	-	-	-	-	-	(0.012)
Ctv exposure*Voice & Acc.	-	-0.03***	-	-	-	-	-	-
	-	(0.009)	-	-	-	-	-	-
Ctv exposure*Press freedom	-	-	-0.022***	-	-	-	-	-
	-	-	(0.008)	-	-	-	-	-
Ctv exposure*Political parallelism	-	-	-	0.016**	-	-	-	-
	-	-	-	(0.007)	-	-	-	-
Ctv exposure*Ctv audience diversity	-	-	-	-	-0.012	-	-	-
	-	-	-	-	(0.014)	-	-	-
Ctv exposure*Licence fee	-	-	-	-	-	-0.008	-	-
	-	-	-	-	-	(0.008)	-	-
Ctv exposure*Public funding	-	-	-	-	-	-	-0.009	-
	-	-	-	-	-	-	(0.01)	-
Ctv exposure*Info programs	-	-	-	-	-	-	-	-0.016*
	-	-	-	-	-	-	-	(0.009)
-2 log likelihood	-34876	-34870.7	-34866.8	-34866.1	-34872.2	-34867.6	-34865.4	-34875

***: p<.01; **: p<.05; *: p<.1
See notes to Table 4.c.

Table 4.a: Effects of level-1 variables on political knowledge in Models 3.a-3.d (regression coefficients with standard errors in parentheses)

Model:	3.a	3.b	3.c	3.d
Intercept	0.504***	0.504***	0.504***	0.504***
	(0.002)	(0.002)	(0.002)	(0.002)
Political interest	0.157***	0.157***	0.157***	0.158***
	(0.012)	(0.012)	(0.012)	(0.012)
Partisanship	0.029***	0.03***	0.029***	0.029***
	(0.007)	(0.007)	(0.007)	(0.007)
Age	0.168***	0.169***	0.168***	0.169***
	(0.048)	(0.047)	(0.047)	(0.047)
Age squared	-0.255***	-0.257***	-0.254***	-0.256***
	(0.055)	(0.055)	(0.055)	(0.054)
Education	0.109***	0.109***	0.108***	0.109***
	(0.009)	(0.009)	(0.009)	(0.009)
P[ublic]tv exposure	0.028***	0.028***	0.028***	0.028***
	(0.006)	(0.006)	(0.006)	(0.006)
Ptv exposure*Political interest	-0.021***	-0.021***	-0.021***	-0.021***
	(0.007)	(0.007)	(0.007)	(0.007)
C[ommercial]tv exposure	0.018***	0.018***	0.018***	0.018***
	(0.006)	(0.006)	(0.006)	(0.006)
Ctv exposure*Political interest	-0.023***	-0.023***	-0.023***	-0.023***
	(0.008)	(0.008)	(0.008)	(0.008)
Paper-reading	0.021**	0.021**	0.021**	0.021**
	(0.009)	(0.009)	(0.009)	(0.009)
-2 log likelihood	-34830.8	-34833	-34830.2	-34832.9

***: p<.01; **: p<.05; *: p<.1

See notes to Table 4.c.

Table 4.b: Standard deviation of level-1 effects across level-2 cases in Models 3.a-3.d

Model:	3.a	3.b	3.c	3.d
Intercept	0.01***	0.01***	0.01***	0.01***
Political interest	0.049***	0.049***	0.05***	0.05***
Partisanship	0.03***	0.03***	0.03***	0.03***
Age	0.194***	0.193***	0.194***	0.192***
Age squared	0.22***	0.218***	0.219***	0.217***
Education	0.035***	0.034***	0.035***	0.035***
P[ublic]tv exposure	0.019***	0.018***	0.018***	0.018***
C[ommercial]tv exposure	0.015***	0.014***	0.014***	0.014***
Paper-reading	0.033***	0.033***	0.033***	0.034***
-2 log likelihood	-34830.8	-34833	-34830.2	-34832.9

***: p<.01; **: p<.05; *: p<.1

See notes to Table 4.c.

Table 4.c: Cross-level interactions among the determinants of political knowledge in Models 3.a-3.d

Model:	3.a	3.b	3.c	3.d
Ptv exposure*Voice & Acc.	-	0.014	-	0.015
	-	(0.015)	-	(0.015)
Ptv exposure*Press freedom	0.012	-	0.011	-
	(0.011)	-	(0.01)	-
Ptv exposure*Political parallelism	-0.014	-0.01	-0.007	-0.004
	(0.011)	(0.013)	(0.012)	(0.012)
Ptv exposure*Ptv audience diversity	0.054***	0.06***	0.064***	0.069***
	(0.014)	(0.016)	(0.015)	(0.016)
Ptv exposure*Licence fee	-	-	0.012	0.013
	-	-	(0.013)	(0.014)
Ptv exposure*Public funding	-0.013	-0.009	-	-
	(0.014)	(0.014)	-	-
Ptv exposure*Info programs	0.045***	0.039***	0.031**	0.026**
	(0.013)	(0.014)	(0.012)	(0.012)
Ctv exposure*Voice & Acc.	-	-0.031**	-	-0.034**
	-	(0.013)	-	(0.013)
Ctv exposure*Press freedom	-0.02**	-	-0.02**	-
	(0.01)	-	(0.01)	-
Ctv exposure*Political parallelism	0.007	0.001	0.004	-0.001
	(0.008)	(0.011)	(0.009)	(0.011)
Ctv exposure*Ctv audience diversity	-0.011	-0.023	-0.009	-0.022
	(0.014)	(0.014)	(0.015)	(0.014)
Ctv exposure*Licence fee	-	-	0.008	0.01
	-	-	(0.011)	(0.011)
Ctv exposure*Public funding	0.012	0.01	-	-
	(0.015)	(0.014)	-	-
Ctv exposure*Info programs	-0.015	-0.001	-0.014	-0.001
	(0.014)	(0.012)	(0.012)	(0.01)
-2 log likelihood	-34830.8	-34833	-34830.2	-34832.9

***: p<.01; **: p<.05; *: p<.1

Notes: Table entries in Tables 3.a to 5.c are parameter estimates for a two-level random-coefficient random-intercept multilevel model obtained with HLM6. The number of level-1 cases is 29029 and the number of level-2 cases is 35 for all models. The data are weighted with the demographic weights deposited with the EES data sets as well as to adjust for unequal sample sizes across level-2 units. Each level-1 independent variable is centred around its mean within the equally weighted level-2 units. Each level-2 independent variable is centred around its grand mean.