Not all News Sources are Equally Informative: A Cross-National Analysis of Political Knowledge in Europe

Abstract:

Across a sample of 27 European nations, we examine variation in the level of factual political knowledge in relation to self-reported exposure to news programs aired by public or commercial channels, and to broadsheet or tabloid newspapers. Unlike previous studies, we estimate the effects of exposure to these news outlets while controlling for self-selection into the audience. Our results show that the positive effects of exposure to broadsheets and public broadcasting on knowledge remain robust. Finally, we show that only exposure to broadsheets (and not to public broadcasting) narrows the knowledge gap within nations; relatively apathetic individuals who read broadsheet newspapers are able to "catch up" with their more attentive counterparts.

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Introduction

The news media represent the principal intermediary between real-world events and the public. Since people depend on the media for information about the course of public affairs, the exercise of informed citizenship requires not only motivated citizens, but also a media environment that provides an abundant supply of news.

Communication scholars have identified both between-nation and within-nation variation in the production and delivery of news. The former is attributable to differences in national media systems (see Hallin and Mancini 2004). In public service systems -- countries that support public broadcasting and actively regulate commercial broadcasters -- television newscasts with considerable substantive content air frequently during peak viewing hours. In market-based systems, on the other hand, unregulated commercial networks respond to market forces and offer news programming that is superficial and sporadic (Aalberg et al. 2010). Thus, public service systems provide greater opportunities for citizens to encounter informative news (Aalberg and Curran 2012; Iyengar et al. 2010; Curran et al. 2009; Soroka et al. 2013).

At the within-nation level of analysis, there is variation in news programming across print and broadcast news sources. Most studies document that the effects of exposure to broadcast news on knowledge gain are typically null or even negative, whereas exposure to print sources is associated with significant gains in knowledge (Delli Carpini and Keeter 1996; Newton 1999; Robinson and Levy 1976; Price and Zaller 1993).

Within-nation variability in the informative effects of the news media is not limited to the differential effects of particular sources. There is also the possibility of a further contingency: that exposure to news programming facilitates political learning among different strata of the news audience. Because attentive citizens are more likely to learn, exposure to news may

increase the existing gap in political knowledge between the "haves" and "have-nots."

According to this derivation of the knowledge gap hypothesis (Donohue et al. 1975; Hwang and

Jeong 2009), groups higher in socioeconomic status or political motivation acquire media-

transmitted information at a faster rate than lower status or less motivated strata.

This article attempts to bridge the comparative and within-nation literatures on source

differentials in the transmission of information. We examine variation in the level of factual

political knowledge in relation to self-reported exposure to print and broadcast news outlets that

offer a preponderance of soft or hard news programming. Using a sample covering 27 European

democracies, 58 television networks and 84 daily newspapers, we show that exposure to hard-

news oriented sources (especially broadsheet newspapers but also public broadcasting) produces

significant information gain while exposure to soft-news oriented outlets (e.g. tabloid

newspapers) does not. The differential ability of sources to transmit politically relevant

information also explains why it is possible for relatively apathetic individuals who read

broadsheet newspapers to "catch up" with their more attentive counterparts at least in the

relatively information rich context that we analyze here, namely, the 2009 European Union

electoral campaign.

The methodological contribution of the study is to disentangle the effects of exposure to

news sources on political knowledge from the opposite possibility, namely, that more attentive

citizens seek out hard news. We demonstrate that the observed effects of exposure to broadsheet

newspapers and public television newscasts remain robust -- albeit weakened -- after we

implement an estimation methodology (propensity score matching) that takes into account the

tendency of more informed individuals to self-select into the audience for broadsheet newspapers

and public broadcasting. Thus, unlike the vast majority of previous studies, our estimates of the

effects of particular media sources on political knowledge take into account motivational or resource-related biases in the use of these sources.

Theoretical Expectations

The debate about the potential effects of the media on political knowledge is well alive in the communication literature. While there is little doubt that the news media matters as providers of political information for citizens, the empirical record about the informative effects of media exposure is mixed. Past studies lamented the low quality of information provided by the media (especially television) and linked media exposure to a decrease in citizens' political knowledge (Putnam, 2000). Others, however, show that media exposure is related to political learning (Norris 2000) while still others emphasize the contingency of media effects on political learning and knowledge, reporting null or even negative effects of television and positive effects of newspapers (Delli Carpini and Keeter 1996; Eveland, 2001; Newton 1999).

It is difficult to interpret the available evidence because these studies are plagued with methodological problems, the most important being the fact that they do not consider the content of the media in their analysis. In contrast they tend to use approximate self-reported measures of media use (Barabas and Jerit, 2009). These shortcomings can produce systematic over (infra) estimations of the informative effects of the mass media (Druckman, 2005). There is, however, a recent trend in the literature that addresses this limitation by including measures of media content in their empirical analyses thereby going beyond the general (and somehow ambiguous) hypothesis that media coverage impinges on citizens' knowledge to actually demonstrating which elements of media coverage matter for knowledge. More specifically, these studies have demonstrated that the informative effects of news stories depend very much on the density of

information they contain (Jerit et al. 2006), on the volume, salience, and prominence of news media coverage (Barabas and Jerit, 2009), and on the type of news stories (that is: hard news versus soft news, Curran et al. 2009). Or put differently, the informative effect of the media depends very much on the content delivered by different media sources: serious, in-depth news can inform the public whereas superficial and sensationalist news does not.

Although previous studies hypothesize a slow but permanent process of convergence between national media systems (see Hallim and Mancini 2004) the truth is that systematic comparative tests of the hypothesis are scarce and their results inconclusive. While some studies show a general increase in the commercialization of television channels (Klimkiewicz 2010) and the convergence of journalistic norms (Plasser, 2005), a recent comparative study shows clear differences across media systems both in the supply of news and in the potential informative effects of such news (Aalberg and Curran 2012). Moreover there is an abundance of evidence showing that public broadcasters deliver substantive news more frequently than privately owned television networks (Aalberg and Curran 2012; Brekken et al. 2012; Curran et al. 2009; Curran et al. 2012; Iyengar et al. 2010; de Vreese and Boomgaarden 2006). Unlike commercial networks, that have compelling incentives to "popularize" the content of their news offerings (by emphasizing sex, sleaze, and scandal), public broadcasters are mandated to deliver news programs that educate rather than entertain and to air their newscasts during periods of high viewership (Hallin and Mancini 2004: 280; Holtz-Bacha and Norris 2001; Newton 1999; de Vreese and Boomgaarden 2006; Curran et al. 2009). These programming differences make for stronger learning effects exerted by the public broadcaster (e.g. Iyengar et al. 2010; Curran et al. 2009). This constitutes the first hypothesis (H1) we test here.

While differences in the content and frequency of news programming delivered by public and commercial broadcasters are well known (see Aalberg et al. 2010), researchers have given less attention to a parallel distinction within the print sector, with equally important consequences for the supply of news. We refer to the distinction between broadsheet and tabloid daily newspapers. From the days of the "penny press," tabloid newspapers have consistently attracted relatively large circulations by responding to popular demand. Tabloids focus heavily on entertaining subject matter including celebrity life, scandals and sports (Tiffen 2011; Rooney 1998). Given their distinctive emphasis, tabloids are derided by journalism scholars who treat broadsheets as the print equivalent of the public service broadcaster (Tiffen 2011; for a dissenting view, see Ornebring and Jonsson 2004). However, there is only limited evidence concerning the differential contributions of tabloids and broadsheets to their audience's level of political knowledge. Exposure to broadsheet newspapers is positively associated with political knowledge in Denmark, the Netherlands and the United Kingdom (de Vreese and Boomgaarden 2006; Newton 1999), but ours is the first study to replicate this finding across a large sample of nations and outlets. The second hypothesis we test (H2) states that in comparison with tabloids, broadsheets are more likely to inform citizens.

A final question derived from the informative effects of the media literature addresses the extent to which news sources tend to inform all citizens equally. The hypothesis that media exposure can potentially increase the existing knowledge gap among citizens has a long tradition in the discipline of communication and derives from the original work of Tichenor et al. (1970) who argued not only that the information rich get richer when exposed to media outlets, but also that this gap might increase as mass media circulation expanded. This hypothesis has generated a

substantial body of research and an ongoing active debate over the existence and nature of a socially structured knowledge gap (Hwang and Jeong, 2009)

Higher status socioeconomic or politically motivated groups are expected to acquire media-transmitted information at a faster rate than lower status or less motivated groups. As a result, media exposure exacerbates existing inequalities in political knowledge. However, exposure to sources regularly offering high levels of substantive content may actually decrease the knowledge gap (Eveland and Scheufele 2000), especially during periods when news coverage peaks, e.g. election campaigns. Under these circumstances (i.e. information rich contexts) exposure to newspapers and television news programs may reduce rather than increase the knowledge gap (Van Aelst et. al. 2012).

Previous studies have shown not only that information opulent environments accentuate the abilities and willingness of citizens to pay the cost of becoming informed about politics, but also that information-rich settings contribute to a reduction of the inequalities in knowledge (Berggren, 2001; Fraile, 2013; Iyengar *et al*, 2010). More specifically, these studies show that the importance of abilities (Berggren, 2001), motivation (Iyengar *et al*, 2010) and socioeconomic status (Fraile, 2013) in explaining political knowledge varies across contexts, being less important in information-rich environments, but especially relevant in information-poor contexts. Thus, our last hypothesis (H3) stipulates that those media sources presenting informative effects in information rich contexts (such as the context of the EU election campaign under analysis here) reduce the knowledge gap between low status and unmotivated citizens and their high status and motivated counterparts.

Research Design: Data and Techniques

To test our hypotheses we rely on comparative data consisting of twenty-seven democracies included in the 2009 European Election Survey (EES), data can be accessed at: http://www.piredeu.eu/public/Data_Release.asp. These countries encompass significant variation in the structure of media markets, the extent of regulation of commercial broadcasters, and the relative strength of the mass circulation press. These are critical system-level attributes that are the basis for differentiating between particular media systems (Hallin and Mancini 2004).

Although this study focuses on differences across news outlets (and not across countries) we believe that maximizing the number of countries under analysis makes our results more generalizable. The existing cross-national literature on information gain through media exposure typically focuses on a limited set of nations representing the market-based and democratic corporatist models of media systems (see, for instance, Aalberg and Curran 2011). In contrast, the data used here allows us to test for difference in source effects across 27 European nations representing a variety of media systems.

The 2009 EES data was collected following the 2009 European Parliament elections (between June 4 and 7, 2009). The intended sample size was 1000 successful interviews within each of the 27 EU member states. Data collection was done by CATI phone interview (details about data collection can be seen in Marcel et al. 2010).

Our analysis is based on a multi-item measure of political knowledge. The survey included seven fixed-choice questions (using a true/false format) measuring various aspects of citizens' knowledge of the EU (e.g. identifying EU member states, awareness of EU institutional arrangements, etc.) as well as their knowledge of domestic national politics (e.g. the identity of a major cabinet minister, and the rules of the 'democratic game' of each respective country). Our

measure of knowledge is the number of correct responses provided (from 0 to 7 correct responses). Unfortunately the survey did not include questions that refer explicitly to current events or soft news. Our indicator is thus a blend of "civics" or general knowledge and some hard news knowledge. The on line appendix contains the exact wording of the seven questions (Table 1). Since general political knowledge is known to depend primarily on long term, pre-dispositional factors such as education and political attentiveness and is less susceptible to short-term factors such as the level of media coverage (see Jerit et al. 2006), our dependent measure provides a conservative test of the role of media content. Any effects of the information environment on general knowledge would likely be weaker than the corresponding effects on issue-specific or event-centered political knowledge.[i]

Next, we analyze the measure of knowledge as a function of individual-level exposure to particular broadcast and print sources. Respondents were first asked, "In a typical week, how many days do you watch the following news programs?" In each country, the response options included the two or three main national news broadcasts including at least the most-widely watched public and commercial television newscast (see Schuck et al. 2010).[ii] On the basis of this item, we measured respondents' level of exposure to newscasts aired by public or private broadcasters.

In the case of exposure to newspapers the survey asked, "In a typical week, how many days do you read the following newspapers?" The choice set included up to three major daily national newspapers. For each country the 2009 EES study included one right-wing and one left-wing broadsheet paper and one tabloid paper. For countries without a pure tabloid the most sensationalist-oriented daily newspaper was included. Respondents who reported reading either a

tabloid-sensationalist or broadsheet newspaper were scored according to their frequency of exposure to each type of newspaper from zero to seven days a week. [iii]

A detailed list of the broadcasts and newspapers considered here for each country and its correspondent classification as public or commercial and broadsheet or tabloid-sensationalist is given in the on line appendix, Table 3 (for broadcasts) and Table 4 (for newspapers). For the case of the broadcasts the distinction is clear (public versus commercial channels). In the case of newspapers, as noted above, only seventeen countries included a proper tabloid. Another four included a newspaper that is clearly sensationalist: *Il Giornale* in Italy, *De Telegraaf* in Netherlands, *Vesti Segodnya* in Latvia, and *Correio da Manha* in Portugal. The remaining six countries (Cyprus, France, Greece, Luxemburg, Malta and Spain) included only broadsheets and no tabloids.

We validated our classification of newspapers and television channel in two ways. First we analyzed the content data of the European Parliament Election Study, which spans a total of 142 news outlets. We calculated the percentage of total stories provided by each outlet that could be considered either hard news or soft news. The results show that in general newspapers provide a higher level of hard news coverage than television. More importantly, they show that 'quality' (i.e. broadsheet) newspapers present more hard news than tabloids or sensationalist newspapers, with only two exceptions. Finally, the findings also show that commercial channels tend to provide a lower ratio of hard news than public television channels.[iv]

Our second validation method is based on the European Media System Survey (Popescu et al. 2010) in which a group of country experts rated particular news sources according to the extent these sources provide accurate information based on credible and expert sources. [v] Without exceptions the experts rated sources classified as public broadcasters and broadsheet

newspapers more favorably than commercial broadcasters and tabloid-sensationalist newspapers.[vi]

Once we have validated the classification scheme and demonstrated that broadsheets and public broadcasts provide more hard news coverage than tabloids and commercial broadcasts, we turn to the individual-level survey data to assess the effects of exposure to sources on political knowledge. The typical methodology for estimating the impact of exposure to news sources on political knowledge is OLS regression. When the data is structured in two levels (as is the case here, individuals and countries) the appropriate estimation model is multilevel regression. However, conventional regression analysis cannot disentangle learning effects (i.e. knowledge gain) stemming from exposure to particular sources from compositional differences in the audience for different sources. Clearly, exposure to media sources is endogenous to political knowledge; people more interested in politics gravitate to news sources that cater to their interests.

We adjust for self-selection into particular audiences by using propensity score matching. Matching is typically used as an observational substitute for randomization. In the case of news audiences, the selection of news sources is not based on randomization, but instead on choice; therefore, any estimate of "treatment effects" stemming from exposure to particular sources will be upwardly biased. Propensity score-based matching attempts to reduce the bias in the estimate of the treatment effect by comparing individuals in the exposed and non-exposed conditions who have equivalent scores on relevant covariates. These covariates, of course, include the standard antecedents of knowledge, i.e. individual differences in motivation and ability (Althaus 2003; Delli Carpini and Keeter 1996; Luskin 1990)

The first-stage estimation equations for deriving the propensity to be exposed to any of the four sources considered here include covariates theorized to be substantively related to citizens' exposure to news: education, sex, age, political interest and a measure of general exposure to media (and not news). Several studies analyzing individual-level variation in citizens' news consumption across countries in Europe have found that these are the strongest predictors (see for instance Aalberg et al. 2013; Blekesaune et al. 2012; Elvestad and Blekesaune 2008; Shehata and Stromback 2011). We then compute the mean effects of exposure to different news sources on the measure of knowledge after matching on the relevant propensity scores.

Our final analysis explores the extent to which exposure to sources that deliver hard news narrows or widens the knowledge gap (defined in terms of both resources and motivation). Here we revert to the conventional, multilevel regression approach since these results were not undermined by the propensity score matching analysis.

Results

We begin by presenting the results of a conventional multilevel regression analysis of the effects of self-reported exposure to different sources on political knowledge (Table 1). While exposure to newscasts from public broadcasters exerts significant positive effects on knowledge, exposure to news provided by commercial broadcasters has the opposite effect. Similarly, the coefficient for exposure to broadsheet newspapers is positive and significant, while exposure to tabloids is not. Overall, the results show clearly that the relationship between media exposure and knowledge is conditional on source. News sources more likely to deliver hard news (public broadcasters and broadsheets) contribute to the acquisition of political knowledge, while sources more likely to emphasize soft news (commercial broadcasters and tabloids) do not.

[Table 1 about here]

We can visualize the magnitude of the source effects identified in the second column of Table 1 by plotting the fitted political knowledge scores in relation to changes in weekly exposure to media sources from the minimum (never) to the maximum value (seven days a week). As shown in Figure 1, the grey area on either side of the fitted line represents the 95% confidence band around the point estimate.[vii]

[Figure 1 about here]

Although exposure to public broadcasters and broadsheet newspapers both boost knowledge, the effect of broadsheet newspapers appears to exceed that of public broadcasting. The fitted value of political knowledge for a given citizen who self reports no exposure at all to news programs aired by the public broadcaster is 3.7 (see the top left graph in Figure 1). This value increases to 4.2 for a citizen reporting the maximal level of exposure. This amounts to an effect size of around half an additional correct answer out of the seven political knowledge questions. Exposure to broadsheet newspapers shows a stronger effect size (more than double the effect of the public broadcaster) of around 1.2, i.e. moving from the minimum to maximum level of exposure results in slightly more than one additional correct answer. (The predicted mean knowledge increases from 3.6 to 4.8 correct answers as shown in the bottom left panel of Figure 1.) In contrast, the effects of exposure to commercial newscasts and tabloid newspapers appear negligible (see the corresponding graphs in Figure 1).

Thus far, we have relied on conventional multilevel regression to document that exposure to hard news-oriented sources is related to higher levels of general political knowledge in Europe. We must treat these results with some skepticism because of the inherently self-selected nature of media audiences. In general, more motivated, informed and knowledgeable citizens are

the most likely to seek out hard news. Of course we cannot definitively overcome this causal circularity between knowledge and source selection since we do not have longitudinal data.

While the panel design (see, for instance, de Vreese and Boomgaarden 2006; Jenssen 2009) provides some leverage over questions of changes in knowledge, it does not directly address the problem of endogeneity. People who read broadsheets may register greater increases in knowledge over time not because of the political content delivered by the broadsheet, but because they are especially attentive to political news. An alternative strategy for estimating treatment effects in non-randomized contexts is propensity score analysis (Levendusky 2011). The underlying idea is to implement a series of comparisons between treatment and control groups within subgroups defined by covariates that predict selection into the treatment group. This means we are in fact comparing cases that are essentially indistinguishable with respect to background factors, except for the fact that some are exposed to a particular news source and others are not.

Propensity score matching was designed to overcome failures of random assignment in experiments where compliance with assignment to treatment is often correlated with attributes of the subject population. In observational studies, where physical control over the treatment is impossible, assignment to "treatment" is typically conditional on a selection process that is driven by the very same factors that affect the outcome variable. The fact that the audiences for hard news are drawn disproportionately from the ranks of the politically engaged makes it necessary to estimate the average treatment effect after first adjusting for self-selection into the treatment group (for reviews of the matching methodology, see Caliendo and Kopeinig 2008; Imbens 2004). Since we have information on the main factors structuring exposure to media

sources (covariates), we can at least partially overcome the problem of self selection and recover an unbiased estimate of the treatment effect.

Of course matching does not overcome all problems of endogeneity in the estimation of the media effects. Instead, a properly specified propensity score equation only yields more accurate (and typically more conservative) estimates of treatment effects in comparison to the estimates obtained by the standard OLS regression technique. In short, we see propensity score matching as a potentially useful technique to ameliorate some, though not all of the problems associated with self selection (for a similar view see Levendusky 2011; Soroka et al. 2013). This is especially true considering that there are relevant content differences across the media outlets analyzed here (see the results summarized in Table 5 and 6 in the online appendix), with broadsheets presenting the highest percentage of hard news followed by public broadcasts, commercial broadcasts and finally tabloids.

In order to compute the propensity scores, we first define exposure to the treatment by reducing the scale of the weekly exposure question to a simple dichotomy. In effect, we contrast those with some exposure to the source in question (e.g. public broadcasting oriented news) with those not exposed at all. This strategy is necessary to generate propensity scores for exposure to each of the media sources analyzed here (Levenduski 2011; Soroka et al. 2013). Since the logic of matching is to compare treated and untreated observations, we need to dichotomize exposure to news. Following previous studies (see for instance Soroka et al. 2013), and for the sake of statistical efficiency (that is, having enough observations in each of the two categories) we created binary treatment variables that divide the sample roughly in half. This is true for all four treatment variables except one: exposure to tabloids (where the distribution is skewed with 17.08% of respondents declaring to be exposed versus 82.92% unexposed).[viii]

We then estimate first-stage equations for each of these treatment variables as a function of the standard predictors of news media exposure: respondents' education, sex, age, political interest, as well as an indicator of general media use (not specifically referring to news). For each of the four treatment (source) variables, the propensity score matching equation satisfied the necessary balancing properties.[ix]

Table 2 shows the matching results contrasting the differences in knowledge between the treated and untreated group (that is, citizens exposed and not exposed to a given source). More specifically, for each outlet we see in the first line the differences in knowledge between respondents exposed versus not exposed before matching while in the second line we see the same differences after matching (that is, once we implemented the matching technique). In the on line appendix --following the approach suggested by Becker and Ichino (2002)-- we also provide a comparison of results based on four different propensity score matching algorithms (see Table 7). While none of them is a priori superior to the others their joint consideration offers a way to assess the robustness of the estimates (Becker and Ichino 2002).

The most noteworthy result in Table 2 is that the informative effects of exposure to broadsheet newspapers survive the implementation of matching (and according to Table 7 in the on line appendix no matter which matching method is employed). Although the magnitude of the coefficient measuring the treatment effect decreases noticeably after matching, the pattern of results obtained in Table 1 (Equation 2) persists. This is also the case for exposure to public broadcasting where matching shrinks the magnitude of the coefficient. Moreover Table 7 in the on line appendix shows cases of estimated average treatment effects on the treated that are non-significant (for example in the case of estimation with the Radius matching algorithm). Thus, both the informative effects of exposure to news programs aired by public broadcasters and news

from broadsheet newspapers appear to survive this second more conservative estimate of treatment effects. These findings are consistent with a recent study based on a smaller sample of nations that also implements matching (Soroka et al. 2013).

[Table 2 about here]

Having demonstrated that the effects of exposure to broadsheet newspapers and public broadcasting on knowledge are robust, we proceed to examine the extent to which these particular media sources contribute to widen or narrow information inequalities between the "haves" and "have-nots." There are two main sources of information inequality: inequality stemming from differential motivation or differential resources. For this analysis, we revert to conventional multilevel regression analysis since we have demonstrated that it provides a valid (although somehow less conservative) estimate of the informative effects of newspapers and public broadcasts.

We estimate the effects of exposure to broadsheet and broadcasting news on information inequality by specifying an interaction term between exposure to broadsheets (and public broadcasting) and education (an indicator of resource inequality) on the one hand, and exposure to broadsheets (and public broadcasting) and political interest (an indicator of motivational inequality) on the other. The obtained results are shown in Table 3 (Equation 2 and 3 respectively).

[Table 3 about here]

Equation 1 in Table 3 replicates Equation 2 in Table 1. Equation 2 adds the interaction terms between exposure to both broadsheet newspapers and public broadcasts and education, while Equation 3 adds the corresponding interaction terms for political interest. Thus, while

Equation 2 explores the contribution of both broadsheets and public broadcasts to the resource-based knowledge gap, Equation 3 addresses the impact of both broadsheets and public broadcasts on the motivation-based knowledge gap.

The results from Table 3 indicate that exposure to broadsheets, but not public broadcasting has the expected leveling effect on the knowledge gap. The interactions between exposure to broadsheets and education and interest were both significant and negatively signed. In contrast, the interactions did not reach statistical significance for the case of public broadcasting.

The assessment of the magnitude of the interactions requires that we plot the expected marginal effect of each of the components of the knowledge gap (education and interest) for individuals either exposed or not exposed to broadsheet newspapers (see Brambor, Clark and Golder 2006). The solid sloping line denotes the marginal effect, and the dashed lines indicate a 95% confidence interval based on the estimates of Equations 2 and 3 in Table 3 respectively. When the value 0 of the predicted marginal effect is not within the upper and lower bounds of the confidence interval, the marginal effect is statistically significant. As can be seen in Figure 2 (see the top graph of the figure), the marginal effect of education on knowledge is always significant but it slightly decreases (from 0.28* to 0.21*) as weekly exposure to broadsheets increases. [x]

[Figure 2 about here]

The results are also relevant in the case of the motivational knowledge gap (see the bottom graph of Figure 2). Here the marginal effect of political interest on knowledge is always significant, but decreases substantially (from 0.71* to 0.41*) as citizens' weekly exposure to broadsheets rises. Or put another way, among less exposed citizens the effect of political interest

on knowledge is about twice as large (0.71*) as among highly exposed citizens (0.41*). Clearly, the reading of broadsheet newspapers contributes to a leveling of the knowledge gap. We discuss these findings and their implications for future research in the last section.

Discussion and Conclusion

The practice of serious journalism contributes to an informed public. Our evidence shows that exposure to broadsheet newspapers and public broadcasts that typically cover hard news results in higher levels of knowledge. This implies that it is not the medium per se but the content delivered by particular media sources that matters. In-depth treatment of public affairs informs, superficial and sensational treatment does not.

Notwithstanding the argument that all news sources are increasingly responding to consumer demand thus creating "convergence" of content across sources (see Aalberg and Curran 2010; Plasser 2005), our analysis confirms that news programs aired by the public broadcaster tend to be more substantive than the offering of commercial channels. After adjusting for selection into the public broadcaster's audience, our analysis finds that viewers exposed to newscasts delivered by the public broadcaster are better informed than those who tune in to commercial broadcasters. In addition, our study breaks new ground by showing that the distinction between public and private broadcasters is overshadowed by the distinction between broadsheet and tabloid daily newspapers. More specifically, we demonstrate that the audience for tabloids is substantially less informed about public affairs than readers of broadsheet newspapers. In the case of broadcast sources, we find that the advantages associated with exposure to the public broadcaster also survive controls for self-selection into the audience, but the magnitude of their informative effects appear somehow smaller than those of the

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broadsheets. Consequently, it is only broadsheets and not public broadcasters who also have the capacity to narrow the gap in knowledge between more and less advantaged citizens.

These last findings confirm not only that information- rich contexts can overcome the costs of becoming informed about politics, but also that information-rich environments contribute to a reduction of the inequalities in knowledge (Berggren, 2001; Fraile, 2013; Iyengar *et al*, 2010). In the case of the EU electoral campaign (which can be reasonably considered an information-rich context), broadsheet newspapers present relevant informative effects that reduce the knowledge gap between low resource and unmotivated citizens and their high resource and motivated counterparts.

Despite previous studies arguing the impossibility of systematically demonstrating media influence on political attitudes and behavior (see Bennett and Iyengar, 2008; Mondak, 1995; Newton 2006), we demonstrate that news stories containing serious and in depth information have the capacity to inform their audiences. In line with recent innovations in the study of knowledge acquisition (Curran et al. 2009; Barabas and Jerit, 2009; Jerit et al. 2006) we overcome some of the methodological problems affecting previous studies. Our study considers not only measures of media content, but also implements a more conservative estimation strategy (propensity Score Matching) to document the informative effects of media sources.

Of course, our conclusions are subject to several caveats. Most notably, we have focused on within-country differences across outlets, but have ignored differences across countries. In countries where there is greater variation in news content across sources we would expect strengthened source effects on knowledge. The extent to which the conditional effects of sources on knowledge are further conditioned by country or media system attributes, however, is the subject of future research.

In comparison with the extant literature, our evidence is relatively robust. Despite the difficulty of untangling cause and effect relationships in observational mass media research, and despite the fact that the data analyzed here is cross-sectional, we have adjusted for self-selection tendencies within particular audiences, something that to the best of our knowledge represents an innovation in media effects research (for a parallel effort, see Soroka et al. 2013). The use of matching bolsters our claim that the informative effects of broadsheets and public television news are genuine, rather than an artifact of self-selection.

In closing, we reiterate that our analysis provides conservative estimates of the effects of media content on political knowledge given the nature of the survey questions comprising our dependent variable. General knowledge is known to depend more on long-term pre-dispositional factors (such as education or motivation) and less on short-term contextual factors (Jerit et al. 2006). With alternative measures of knowledge that tap awareness of issues and events in the news, the effects of sources on information gain will likely be enlarged, thus strengthening the argument that the delivery of news is a significant determinant of what citizens learn about the political world.

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Table 1: The Informative Effects of Exposure to Broadcast and Print Sources (Multilevel Estimation)

General Exposure to Media	0.093***
	(0.006)
Public broadcasting news exposure	0.024***
	(0.004)
Commercial broadcasting news exposure	-0.031***
	(0.004)
Broadsheet news exposure	0.079***
	(0.004)
Tabloid news exposure	-0.015*
	(0.006)
Level of Education	0.270***
	(0.008)
Male	0.655***
	(0.020)
Age	0.032***
	(0.003)
Age Quadratic	-0.0002***
	(0.000)
Political Interest	0.659***
	(0.022)
Intercept	0.792***
	(0.123)
R^2 within	0.19
R^2 between	0.43
R^2 overall	0.20
N level 1 (individuals)	25737
N level 2 (countries)	27

Source: Our elaboration on 2009 EES Voter Study (Advanced Release, July 2010).
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Dependent variable is the number of correct answers (from 0 to 7).
Independent variables include: General weekly exposure to the Media ("In a typical week, how many days do you follow the news?" From 0 to 7 days); Weekly exposure to public broadcasting news; Weekly exposure to commercial broadcasting news; Weekly broadsheet reading; Weekly tabloid reading; Education (from 0 to 6); Male (1 for male, 0 for female); Age (in years); Political Interest (1 for those who declare to be very and quite interested in politics, 0 for those who are not interested in politics). The specific broadcasts and newspapers considered for each country and their correspondent classification (public versus commercial; and broadsheet versus tabloid) are listed in the on line appendix (Tables 3 and 4).

Table 2. Matching results

	Treated	Controls	Difference	se	t value
Public broadcasts					
Unmatched	0.585	0.532	0.053	0.003	16.27
ATT	0.585	0.572	0.013	0.003	3.66
Commercial broadcasts					
Unmatched	0.551	0.567	-0.016	0.003	-4.97
ATT	0.551	0.608	-0.057	0.014	-4.20
Broadsheets					
Unmatched	0.631	0.512	0.118	0.003	35.75
ATT	0.631	0.583	0.048	0.008	5.48
Tabloids					
Unmatched	0.561	0.558	0.003	0.004	0.75
ATT	0.561	0.667	-0.005	0.008	-0.66

Source: Our elaboration on 2009 EES Voter Study (Advanced Release, July 2010). Propensity scores
are based on probit equations with the following independent variables: age, gender, education, political
interest and general weekly exposure to the Media. For each of the four treatment variables the propensity score
matching equation satisfies the balancing property.

Table 3: Effects of Exposure to Broadsheets on the Knowledge Gap (Multilevel estimations)

	Equation 1	Equation 2	Equation 3
General Exposure to Media	0.093***	0.093***	0.092***
	(0.006)	(0.006)	(0.006)
Public broadcasting exposure	0.024***	0.020***	0.025***
	(0.004)	(0.009)	(0.006)
Commercial broadcasting exposure	-0.031***	-0.031***	-0.031***
	(0.004)	(0.004)	(0.004)
Broadsheets exposure	0.079***	0.109***	0.106***
	(0.004)	(0.011)	(0.007)
Tabloids exposure	-0.015*	-0.014*	-0.015*
	(0.006)	(0.005)	(0.010)
Level of Education	0.270***	0.274***	0.264***
	(0.008)	(0.012)	(0.008)
Male	0.655***	0.653***	0.654***
	(0.020)	(0.020)	(0.020)
Age	0.032***	0.033***	0.032***
	(0.003)	(0.003)	(0.003)
Age ^{2}	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)
Political Interest	0.659***	0.652***	0.719***
	(0.022)	(0.022)	(0.034)
Education*Broadsheets		-0.008**	
		(0.000)	
Education* Public Broadcasting		-0.001	
		(0.002)	
Political Interest*Broadsheets			-0.041***
			(0.0008)
Political Interest*Public broadcasting			-0.003
			(0.007)
Intercept	0.792***	0.760***	0.767***
	(0.123)	(0.120)	(0.113)
R^2 within	0.19	0.19	0.19
R^2 between	0.43	0.44	0.44
R^2 overall	0.20	0.21	0.21
N level 1 (individuals)	25737	25737	25737
N level 2 (countries)	27	27	27

Source: Our elaboration on 2009 EES Voter Study (Advanced Release, July 2010).
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Dependent and independent variables are the same as in Table 1 plus the corresponding interaction terms in Equations 2 and 3.

Figure 1: Predicted Values of Knowledge as Exposure to News Sources Increases
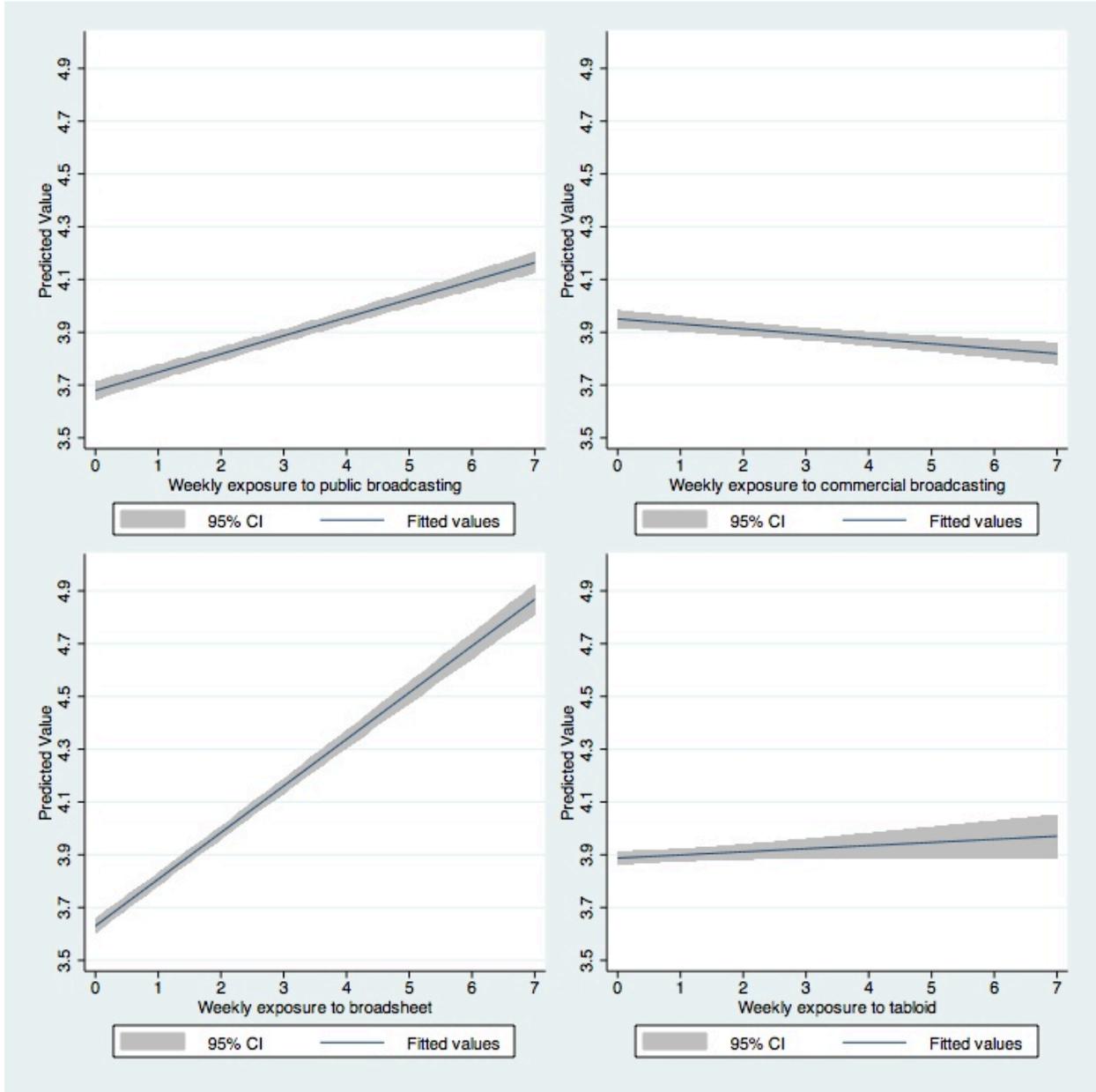
Source: Our elaboration on EES Voter Study (Advanced Release, July 2010). Calculations made on the basis of Table 1.

Figure 2. The Leveling Effect of exposure to broadsheets news on the knowledge gap
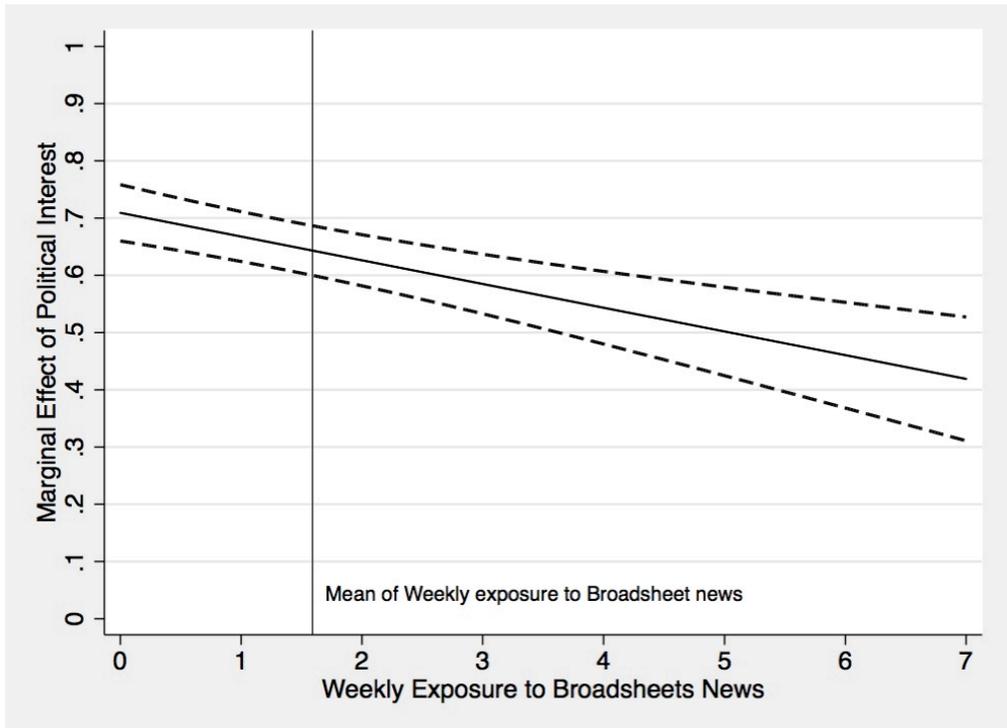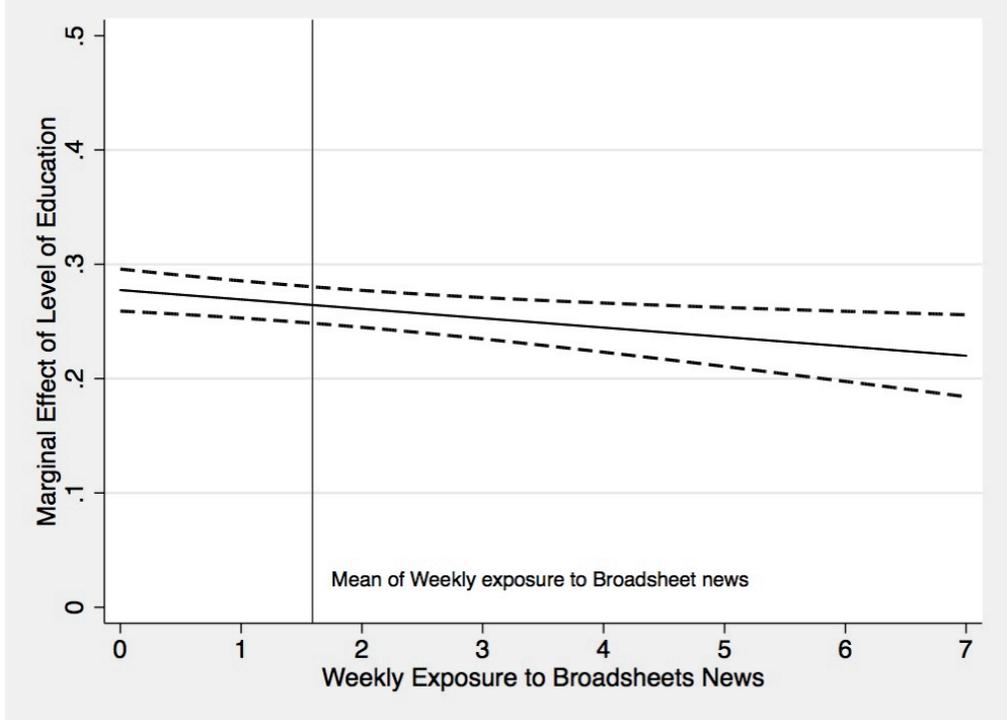
Source: Our elaboration on EES Voter Study (Advanced Release, July 2010). Calculations made on the basis of Table 3 (Equations 2 and 3).

ON LINE APPENDIX

Table 1: Original Wording of Items (don't know responses scored as incorrect):

Q92. Switzerland is a member of the EU: True/False
Q93. The European Union has 25 member states: True/False
Q94. Every country in the EU elects the same number of representatives to the European Parliament. True/False
Q95. Every six months, a different Member State becomes president of the Council of the European Union. True/False
Q96. The [Specific Minister] is [Correct name]. True/False
Q97. Individuals must be 25 or older to stand as candidates in [COUNTRY] elections. True/False
Q98. There are [150% of real number] members of the [COUNTRY Parliament]. True/False

Table 2: Descriptive Statistics

Variable	N	Mean	Std. Dev.	Min	Max
Number of correct responses to Knowledge questions	27069	3,90	1,87	0	7
General Exposure to Media	26893	5,96	1,85	0	7
Public broadcasting news exposure	27069	3,13	2,82	0	7
Commercial broadcasting news exposure	27069	2,90	2,79	0	7
Broadsheets exposure	27069	1,50	2,42	0	7
Tabloids exposure	27069	0,73	1,60	0	7
Level of Education	26206	3,41	1,38	0	6
Male	27068	0,44	0,50	0	1
Age	26763	51,29	16,91	19	100
Political Interest	26978	0,54	0,50	0	1

Source: Our elaboration on 2009 EES Voter Study (Advanced Release, July 2010).

Table 3: List of Broadcasts and their Classification

Country	Broadcasts and its television channel	Classification
Austria	ZiB 19.30 (ORF1)	Public
	Aktuell 19.20 (ATV)	Commercial
Belgium-Flandes	Het Journaal 19.00 (VRT)	Public
	VTM-Nieuws 19.00 (VTM)	Commercial
Belgium-Wallonia	Journal Télévisé 19.30 (La Une)	Commercial
	Le Journal 19.00 (RTL-TV)	Public
Bulgaria	bTV Новините 19:00 (bTV)	Public
	По света и у нас 20:00 (BNT kanal 1)	Commercial
Cyprus	Ειδήσεις 20.00 (RIK1)	Public
	Τα Νέα του Ant1 20.15 (Antenna)	Commercial
Czech Republic	Události 19.00 (Česká televize)	Public
	Televizní noviny 19.30 (TV Nova)	Commercial
Denmark	Nyhederne 19.00 (TV2)	Commercial
	TV-avisen 21.00 (DR 1)	Public
Estonia	Aktuaalne kaamera 21.00 (ETV)	Public
	Reporter 19.00 (Kanal2)	Commercial
Finland	Tv-uutiset ja sää 20.30 (YLE TV1)	Public
	Kymmenen uutiset 22:00 (MTV3)	Commercial
France	Le Journal 20.00 (TF1)	Commercial
	Le Journal 20.00 (F2)	Public
Germany	Tagesschau 20.00 (ARD)	Public
	Heute 19.00 (ZDF)	Public
	RTL aktuell 18.45 (RTL)	Commercial
	SAT1 Nachrichten (20.00)	Commercial
Greece	Κεντρικό Δελτίο 20.00 (Mega)	Commercial
	Ειδήσεις NET (21.00)	Public
Hungary	Híradó 19:30 (M1)	Public
	Esti Híradó 18:30 (RTL Klub)	Commercial
Italy	TG1 20.00 (RaiUno)	Public
	TG5 20.00 (Canale5)	Commercial
Ireland	Nine O'Clock News (RTE 1)	Public
	TV3 News 17:30 (TV3)	Commercial
Latvia	Panorāmas 20:30 (LTV)	Public
	LNT Ziņas 20:00 (LNT)	Commercial
Lithuania	Panorama 20:30 (LTV)	Public
	TV3 Žinios 18:45 (TV3)	Commercial
Luxemburg	Le Journal 19.30 (RTL)	Commercial
Malta	L-Aħbarijiet TVM 20:00 (TVM)	Public
	One News 19.30 (One TV)	Commercial
Netherlands	RTL Nieuws 19.30 (RTL)	Commercial
	NOS Journaal 20.00 (N1)	Public
Poland	Wiadomości 19:30 (TVP1)	Public
	FAKTY 19:00 (TVN)	Commercial
Portugal	Telejornal 20:00 (RTP1)	Public
	Jornal Nacional (20:00) (TVI)	Commercial
Romania	Telejurnal 20:00 (TVR1)	Public
	Ştirile 19:00 (PRO TV)	Commercial

Slovakia	Spravy 19:30 (STV 1)	Public
	Televizne Noviny 19:00 (TV Markiza)	Commercial
Slovenia	Dnevnik 19.00 (TV S1)	Public
	24UR 19.00 (POP TV)	Commercial
	Svet 18:00 (Kanal A)	Commercial
Spain	Telediario-2 21.00 (TVE1)	Public
	Noticias-2 21.00 (Antena 3)	Commercial
	Informativos Telecinco 20.55 (Tele 5)	Commercial
Sweden	Aktuellt 21.00(SVT2)	Public
	Nyheterna 19.00 (TV4)	Commercial
UK	BBC1 News at 10	Public
	ITV news at 10	Commercial

Source: 2009 EES Voter Study (Advanced Release Notes, July 2010)

Table 4: List of Newspapers and their Classification

Country	Newspapers	Classification
Austria	Neue Kronen Zeitung	Tabloid
	Der Standard	Broadsheet
	Die Presse	Broadsheet
Belgium-Flandes	De Standaard	Broadsheet
	Het Laatste Nieuws	Tabloid-Sensationalist
	De Morgen	Broadsheet
Belgium-Wallonia	La Derniere Heure	Tabloid-Sensationalist
	La Libre Belgique	Broadsheet
	Le Soir	Broadsheet
Bulgaria	Dnevik	Broadsheet
	Trud	Broadsheet
	24 Chasa	Tabloid
Cyprus	Fileleytheros	Broadsheet
	Simerini	Broadsheet
	Haravgi	Broadsheet
Czech Republic	Mladá Fronta	Broadsheet
	Právo	Broadsheet
	Blesk	Tabloid
Denmark	Jyllands Posten	Broadsheet
	Ekstra Bladet	Tabloid
	Dagbladet Politiken	Broadsheet
Estonia	Postimees	Broadsheet
	SL Õhtuleht	Tabloid
	Eesti Ekspress	Broadsheet
Finland	Helsingin Sanomat	Broadsheet
	Aamulehti	Broadsheet
	Ilta-Sanomat	Tabloid
France	Le Monde	Broadsheet
	Libération	Broadsheet
	Le Figaro	Broadsheet
Germany	Bild	Tabloid
	FAZ	Broadsheet
	SZ	Broadsheet
Greece	Ta Nea	Broadsheet
	Kathimerini	Broadsheet

	Eleftherotypia	Broadsheet
Hungary	Népszabadság	Broadsheet
	Blikk	Tabloid
	Magyar Nemzet	Broadsheet
Italy	Il Corriere della Sera	Broadsheet
	La Repubblica	Broadsheet
	Il Giornale	Sensationalist
Ireland	Irish Independent	Broadsheet
	The Irish Times	Broadsheet
	The (Daily) Star	Tabloid
Latvia	Diena	Broadsheet
	Latvijas Avize	Broadsheet
	Vesti Segodnya	Sensationalist
Lithuania	Lietuvos Rytas	Broadsheet
	Respublika	Broadsheet
	Vakaro žinios	Tabloid
Luxemburg	Wort (D')	Broadsheet
	Tageblatt	Broadsheet
	Voix du Luxembourg	Broadsheet
Malta	The Times (English)	Broadsheet
	L-Orizzont	Broadsheet
	In-Nazzjon	Broadsheet
Netherlands	De Telegraaf	Sensationalist
	NRC Handelsblad	Broadsheet
	de Volkskrant	Broadsheet
Poland	Rzeczpospolita	Broadsheet
	Gazeta Wyborcza	Broadsheet
	Fakt	Tabloid
Portugal	Público	Broadsheet
	Correio da Manhã	Sensationalist
	Jornal de Notícias	Broadsheet
Romania	Libertatea	Tabloid
	Jurnalul National	Broadsheet
	Evenimentul Zilei	Broadsheet
Slovakia	Nový čas	Tabloid
	Pravda	Broadsheet
	Sme/Práca	Broadsheet
Slovenia	Slovenske Novice	Tabloid
	Delo	Broadsheet
	Dnevnik	Broadsheet
Spain	El País	Broadsheet
	ABC	Broadsheet
	El Mundo	Broadsheet
Sweden	Aftonbladet	Tabloid
	Dagens Nyheter	Broadsheet
	Svenska Dagbladet	Broadsheet
UK	The Sun	Tabloid
	Daily Telegraph	Broadsheet
	The Guardian	Broadsheet

Source: 2009 EES Voter Study (Advanced Release Notes, July 2010) and European Media Systems Survey 2010

Table 5: Percentage of Hard news in Broadcast News Stories

Country	News shows and their television channels	Type of channel	% of hard news	Number of stories	*Response to item
Austria	ZiB 19.30 (ORF1)	Public	63.5	271	7.44
	Aktuell 19.20 (ATV)	Commercial	52.2	90	4.46
Belgium-F	Het Journaal 19.00 (VRT)	Public	56.8	419	7.11
	VTM-Nieuws 19.00	Commercial	46.4	459	5.66
Belgium-W	JT Meteo 19.30 (La Une)	Commercial	67.9	290	7.00
	Le Journal 19.00 (RTL-TV)	Public	55.0	340	6.22
Bulgaria	bTV 19:00 (bTV)	Public	64.5	363	5.30
	По света и у нас 20:00 (BNT kanal 1)	Commercial	65.9	388	5.90
Cyprus	Ειδήσεις 20.00 (RIK1)	Public	74.7	573	5.37
	Ant1 20.15 (Antenna)	Commercial	60.7	509	3.87
Czech Republic	Události 19.00 (Česká televize)	Public	53.1	408	6.33
	Televizní noviny 19.30 (TV Nova)	Commercial	37.0	227	3.25
Denmark	Nyhederne 19.00(TV2)	Commercial	46.0	189	6.76
	TVavisen 21.00(DR 1)	Public	64.0	197	7.41
Estonia	Aktuaalne kaamera 21.00 (ETV)	Public	62.0	237	7.80
	Reporter 19.00 (Kanal2)	Commercial	33.2	325	4.00
Finland	Tv uutiset ja sää 20.30 (YLE TV1)	Public	71.7	219	8.41
	Kymmenen uutiset 22:00 (MTV3)	Commercial	65.0	202	7.20
France	Le Journal 20.00 (TF1)	Commercial	47.3	479	4.66
	Le Journal 20.00 (F2)	Public	50.0	500	6.66
Germany	Tagesschau 20.00 (ARD)	Public	71.2	222	8.30
	Heute 19.00 (ZDF)	Public	70.6	197	7.86
	RTL aktuell 18.45 (RTL	Commercial	60.6	216	4.68
	SAT1 Nachrichten (20.00)	Commercial	54.8	166	4.31
Greece	Κεντρικό Δελτίο 20.00 (Mega)	Commercial	88.7	328	6.57
	Ειδήσεις NET (21.00)	Public	89.3	336	7.00
Hungary	Híradó 19:30 (M2)	Public	62.9	329	6.13
	Esti Híradó 18:30 (RTL Klub)	Commercial	45.0	400	5.55
Italy	TG1 20.00 (RaiUno)	Public	55.5	350	3.74
	TG5 20.00 (Canale5)	Commercial	53.2	346	3.95
Ireland	Nine O'Clock News (RTEI1)	Public	57.2	203	7.00
	TV3 News 17:30	Commercial	56.6	113	5.50
Latvia	Panorāmas 20:30 (LTV)	Public	74.2	252	7.88
	LNT Ziņas 20:00	Commercial	57.9	309	6.87
Lithuania	Panorama 20:30 (LTV)	Public	71.9	263	6.90
	TV3 Žinios 18:45	Commercial	51.2	234	5.40
Luxemburg	Le Journal 19.30 (RTL)	Commercial	60.3	287	X
Malta	L-Aħbarijiet TVM 20:00	Public	65.2	305	6.57
	One News 19.30 (One TV)	Commercial	82.9	421	4.85
Netherlands	RTL Nieuws 19.30	Commercial	60.1	251	6.15
	NOS Journaal 20.00	Public	66.6	239	6.85
Poland	Wiadomości 19:30 (TVP1)	Public	71.9	153	4.92
	FAKTY 19:00 (TVN)	Commercial	63.5	173	6.20
Portugal	Telejornal 20:00 (RTP1)	Public	71.8	384	6.28
	Jornal Nacional (20:00) (TVI)	Commercial	76.6	240	6.20

Romania	Telejurnal 20:00 (TVR1)	Public	57.1	554	5.54
	Știrile 19:00 (PRO TV)	Commercial	39.8	470	5.48
Slovakia	Spravy 19:30 (STV 1)	Public	68.9	361	5.00
	Televizne Noviny 19:00 (TV Markiza)	Commercial	58.1	318	5.50
Slovenia	Dnevnik 19.00 (TV S1)	Public	80.3	330	6.00
	24UR 19.00 (POP TV)	Commercial	68.7	396	5.33
Spain	Telediario-2 21.00 (TVE1)	Public	68.5	504	6.79
	Noticias-2 21.00 (A3)	Commercial	42.8	493	4.75
	Informativos Tele5 20.55	Commercial	41.2	509	4.65
Sweden	Rapport 19.30 (TV2)	Public	70.0	166	7.67
	Nyheterna 18.25 (TV4)	Commercial	55.1	254	5.85
UK	BBC1 News at 10	Public	71.2	156	7.95
	ITV news at 10	Commercial	63.3	139	6.73
All			61.3		

Source: EES (2009), European Parliament Election Study 2009, Voter Study, Advance Release, July, 2010; Media Study Data, Advance Release, 31/03/2010 (www.piredeu.eu); Information given by: http://www.obs.coe.int/db/persky/index.html and the European Media Systems Survey (EMSS).
* Item: To what extent do these media provide accurate information on facts backed by credible sources and expertise? (categories of response range from 0-Untrue to 10-True). Entries provide the mean value of responses across countries, the highest the punctuation the better the evaluation of each outlet.
[x] No data about Luxemburg.

Table 6: Percentage of Hard News in Newspaper Stories

Country	Newspapers	Type of newspaper	Percentage of hard news	N of stories	*Response to item 1
Austria	Neue Kronen Zeitung	Tabloid	77.1	349	2.16
	Der Standard	Broadsheet	81.5	476	7.94
	Die Presse	Broadsheet	84.6	421	7.55
Belgium-F	De Standaard	Broadsheet	88.5	288	7.05
	Het Laatste Nieuws	Tabloid	63.9	288	4.00
	De Morgen	Broadsheet	79.9	308	6.38
Belgium-W	La Derniere Heure	Tabloid	51.4	208	4.44
	La Libre Belgique	Broadsheet	77.4	208	7.70
	Le Soir	Broadsheet	72.5	244	7.40
Bulgaria	Dnevnik	Broadsheet	96.3	355	6.80
	Trud	Broadsheet	82.4	539	3.60
	24 chasa	Tabloid	75.2	508	3.40
Cyprus	Fileleytheros	Broadsheet	83.7	1022	5.37
	Simerini	Broadsheet	87.7	777	5.12
	Haravgi	Broadsheet	88.7	748	3.28
Czech Republic	Mladá Fronta	Broadsheet	63.5	148	4.77
	Právo	Broadsheet	60.3	287	5.11
	Blesk	Tabloid	25.4	165	1.88
Denmark	Jyllands Posten	Broadsheet	81.6	212	6.35
	Ekstra Bladet	Tabloid	58.1	217	4.58
	Dagbladet Politiken	Broadsheet	85.2	344	6.94
Estonia	Postimees	Broadsheet	70.4	284	6.00
	SL Õhtuleht	Tabloid	59.7	179	3.53
	Eesti Ekspress	Broadsheet	57.9	19	5.93
Finland	Helsingin Sanomat	Broadsheet	75.3	401	8.27
	Aamulehti	Broadsheet	59.4	350	7.89
	Ilta-Sanomat	Tabloid	28.3	166	6.03
France	Le Monde	Broadsheet	86.1	431	8.33
	Libération	Broadsheet	83.9	256	7.50
	Le Figaro	Broadsheet	86.6	350	7.45
Germany	Bild	Tabloid	60.4	364	3.00
	FAZ	Broadsheet	86.2	594	7.93
	SZ	Broadsheet	85.7	400	8.23
Greece	Ta nea	Broadsheet	97.9	555	6.85
	Kathimerini	Broadsheet	87.1	876	7.57
	Eleftherotypia	Broadsheet	93.4	833	7.00
Hungary	Népszabadság	Broadsheet	85.7	330	6.40
	Blikk	Tabloid	43.7	224	1.52
	Magyar Nemzet	Broadsheet	90.4	343	4.27
Italy	Il Corriere della Sera	Broadsheet	78.2	330	7.42
	La Repubblica	Broadsheet	72.5	345	7.28
	Il Giornale	Sensationalist	64.1	380	2.80
Ireland	Irish Independent	Broadsheet	66.1	351	4.70
	The Irish Times	Broadsheet	67.1	610	7.40
	The (Daily) Star	Tabloid	42.9	198	3.50
Latvia	Diena	Broadsheet	78.4	287	7.88
	Latvijas Avize	Broadsheet	88.5	270	7.22
	Vesti Segodnya	Sensationalist	63.7	287	5.22

Lithuania	Lietuvos Rytas	Broadsheet	68.9	161	5.05
	Respublika	Broadsheet	71.5	179	3.52
	Vakaro žinios	Tabloid	68.1	167	2.66
Luxemburg	Wort (D')	Broadsheet	83.1	414	
	Tageblatt	Broadsheet	87,4	333	X
	Voix du Luxembourg	Broadsheet	80,8	324	
Malta	The Times (English)	Broadsheet	78.3	418	7.28
	Orizzont	Broadsheet	84.6	306	4.28
	Nazzjon	Broadsheet	89.4	417	4.28
Netherlands	De Telegraaf	Sensationalist	70.0	397	4.81
	NRC Handelsblad	Broadsheet	78.4	537	8.23
	de Volkskrant	Broadsheet	76.7	386	7.36
Poland	Rzeczpospolita	Broadsheet	84.0	588	6.2
	Gazeta Wyborcza	Broadsheet	77.3	437	6.46
	Fakt	Tabloid	44.8	308	1.86
Portugal	Público	Broadsheet	78.3	383	7.14
	Correio da Manhã	Sensationalist	57.7	428	5.15
	Jornal de Notícias	Broadsheet	74.5	389	6.47
Romania	Libertatea	Tabloid	36.0	200	2.29
	Jurnalul Naţional	Broadsheet	53.7	255	4.89
	Evenimentul Zilei	Broadsheet	74.6	370	5.91
Slovakia	Nový čas	Tabloid	30.3	145	3.00
	Daily Pravda	Broadsheet	73.2	194	6.33
	SME	Broadsheet	74.0	339	6.66
Slovenia	Slovenske Novice	Tabloid	49.1	175	2.15
	Delo	Broadsheet	89.9	636	7.30
	Dnevnik	Broadsheet	90.1	375	7.15
Spain	El País	Broadsheet	90.3	391	6.93
	ABC	Broadsheet	90.4	386	5.75
	El Mundo	Broadsheet	86.8	462	5.10
Sweden	Aftonbladet	Tabloid	68.9	232	4.58
	Dagens Nyheter	Broadsheet	85.0	400	7.09
	Svenska Dagbladet	Broadsheet	80.0	422	7.23
UK	The Sun (Sunday)	Tabloid	54.5	244	2.28
	Daily Telegraph	Broadsheet	77.3	330	6.15
	The Guardian (Sunday)	Broadsheet	74.5	333	7.09
All			73.2		

* Item: To what extent do these media provide accurate information on facts backed by credible sources and expertise? (categories of response range from 0-Untrue to 10-True). Entries provide the mean value of responses across countries, the highest the punctuation the better the evaluation of each outlet.
[X] No data about Luxemburg

Tables 5 and 6 summarize the results of the content analysis and demonstrate that there

are considerable within-nation differences in the content of the news provided by the outlets

analysed. By comparing the percentages of hard news provided by newspapers (Table 6) and television news shows (Table 5) it is clear that newspapers provide a higher level of hard news coverage than television. On average, 73.2 percent of print coverage of the EU campaign focused on hard news whereas the corresponding level for television news was 61.3 percent. If we focus on Table 6, there are clear differences in the level of hard news provided by newspapers. In general, 'quality' (i.e. broadsheet) newspapers present more hard news than tabloids or sensationalist newspapers, with only two exceptions (*Eesti Ekpress* and *SL Õhtuleht*, a broadsheet and a tabloid in Estonia which presented similar percentages of hard news: 57.9% and 59.7% respectively; additionally *Lietuvos rytas* and *Vakaro žinio* a Lithuanian broadsheet and tabloid also presented similar percentages of hard news.

Table 5 shows the differences in the percentage of hard news provided across television news channels. Public broadcasters generally deliver more hard news than their commercial counterparts. There were only three countries where commercial channels provided more hard news coverage than the public broadcaster -- Belgium Wallonia, Malta, and Portugal (although the differences between the two channels in the case of Portugal are slight).

In sum, Tables 5 and 6 confirm that news content is contingent on source factors. As expected, broadsheet newspapers and public broadcasters generally deliver more hard news than tabloids and commercial channels. These differences are striking since the data were collected at a period when the campaign-related activities of political parties and candidates are reflected in the media agenda (see Aelst et al. 2012). We suspect, therefore, that the differences reported in Tables 5 and 6 understate the magnitude of source effects on news content; under more "normal" (that is, non electoral) circumstances, the differences would be enlarged.

Finally, the last column of Tables 5 and 6 shows that the experts who answered the online survey (Popescu et al. 2010) provided on average much better evaluations of broadsheets than tabloids-sensationalist newspapers in all countries without exceptions. In addition, they provided better evaluations of public than commercial television channels although the differences between the television channels are smaller in magnitude than the differences between the newspapers. Moreover in 4 countries (Bulgaria, Italy, Poland and Slovakia) the experts gave a slightly better rating to commercial than to public television channels.

Table 7: ATT estimation with Different Matching Algorithms

| | N | | | | |
	Treated	Control	ATT	se	t-ratio
Public broadcasts					
Nearest Neighbor	13648	11625	0.010	0.004	2.516
Radius Matching	13436	11760	0.001	0.004	0.148
Kernel Matching	13648	12844	0.016	0.004	2.981
Stratification Matching	13648	12844	0.013	0.003	3.951
Commercial broadcasts					
Nearest Neighbor	12773	12587	-0.025	0.003	-7.208
Radius Matching	12706	12880	-0.056	0.004	-15.329
Kernel Matching	12773	13724	-0.023	0.003	-5.803
Stratification Matching	12773	13724	-0.024	0.004	-6.717
Broadsheets					
Nearest Neighbor	9980	12301	0.056	0.004	13.571
Radius Matching	9741	14641	0.051	0.004	13.390
Kernel Matching	9980	15704	0.065	0.004	16.230
Stratification Matching	9980	15705	0.059	0.003	19.171
Tabloids					
Nearest Neighbor	5123	15427	-0.002	0.005	-0.401
Radius Matching	5085	19979	-0.008	0.004	-1.884
Kernel Matching	5123	20613	0.001	0.004	0.897
Stratification Matching	5122	20614	0.004	0.004	0.957

Source: Our elaboration on 2009 EES Voter Study (Advanced Release, July 2010). Propensity scores are based on probit equations with the following independent variables: age, gender, education, political interest and general weekly exposure to the Media.

Figure 1. Distribution of the Estimated Propensity Scores Across Outlets
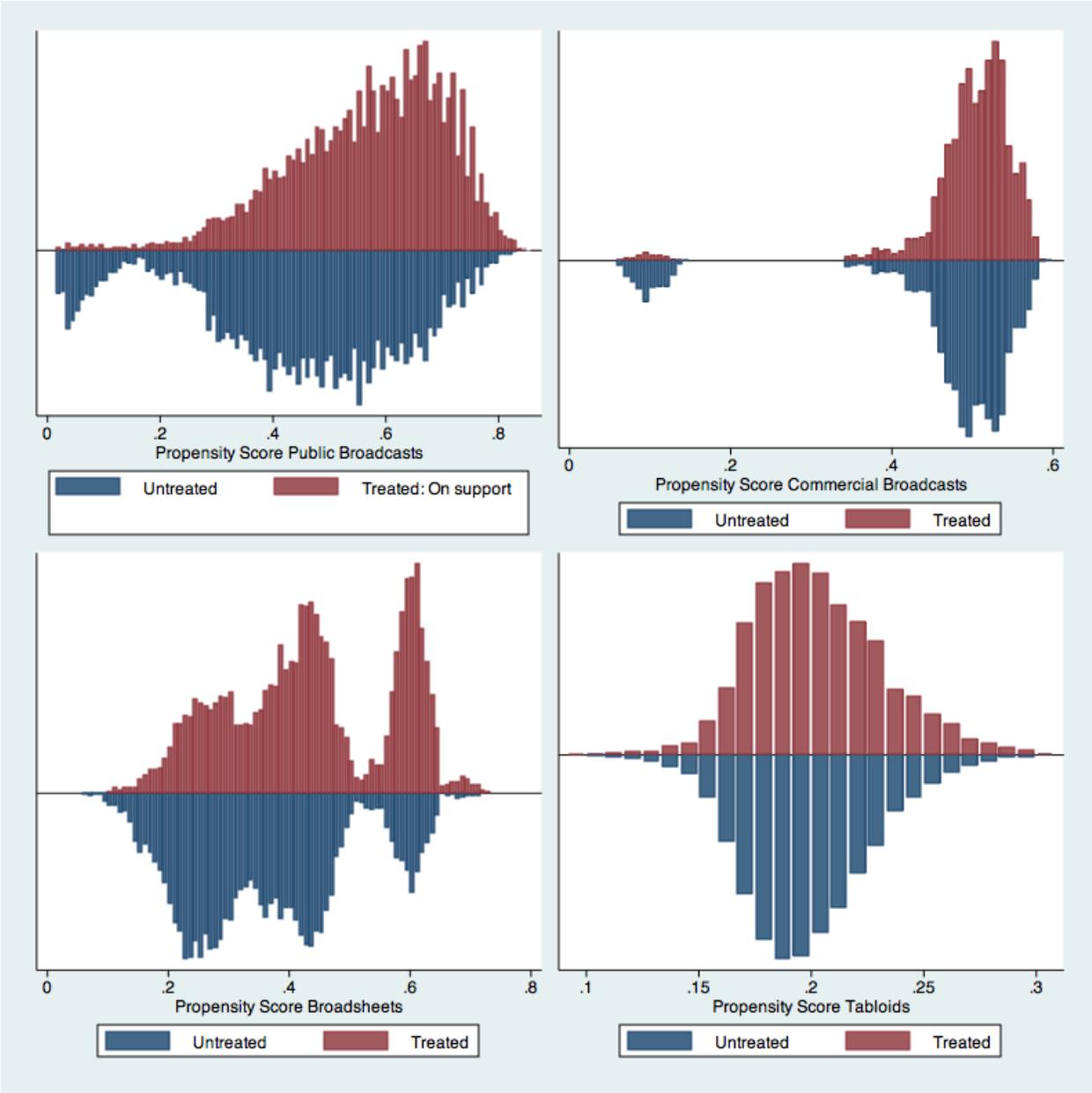
Source: Our own estimations based on the Propensity Scores implemented for each media source.

FINAL NOTES:

[i] Cronbach's Alpha, a standard measure of scale reliability, was .625. We also subjected the items to factor analysis and found that they yielded a single dimension.

[ii] This "program list" approach has two main advantages over standard measures of media exposure such as weekly exposure to news or the amount of time devoted to various genres of programming. First, it decreases the cognitive demands placed on respondents and second, it increases content validity by more accurately incorporating the relevant domain of exposure (Dilliplane, Goldman and Mutz 2013).

[iii] Respondents who do not mention a tabloid are given a score of no exposure (zero).

[iv] These results are included in more detail in the online appendix, Table 5 and Table 6 and their correspondent comments below.

[v] 838 experts responded to an online survey. Details on the selection criteria, questionnaire design, data collection and response rates are given in the study report:

http://www.mediasystemsineurope.org/files/emss10all.pdf.

[vi] Detailed results on the expert ratings for each of the outlets analyzed here are presented in the online appendix (see the last column in Table 3 and Table 4).

[vii] Fitted values of political knowledge in Figure 1 are calculated from Table 1, and with all predictors (except the one of interest in each case: weekly exposure to each outlet) set to their typical values (i.e., means for quantitative variables and proportions for categorical variables).

[viii] We have replicated the analysis with a different re-codification of each of the binary variable by considering 1 (those declaring to be exposed more than 3 days per week) versus 0 those declaring to be exposed less than 3 days per week and the results are equivalent.

[ix] Specific results of testing the balancing property of each of the propensity score calculated here are summarized in the on line appendix, see Figure 1 (Distribution of the Estimated Propensity Scores Across Outlets) which shows that for all media sources observations with the same propensity score have the same distribution of observable covariates independent of treatment status.

[x] The marginal effect of education on knowledge appears to be very slight, but consider that the variable ranges from 0 to 6. Therefore an average marginal effect of 0.22 implies a potential maximum effect of 1.32 additional correct answers if we compare the lowest educated with the highest educated citizen. Conversely, an average marginal effect of 0.28 implies a potential maximum effect of 1.68 additional correct answers.