Why Do Individuals Use Media? An Empirical Enquiry

Maria Rosa Battaggion*, Alessandro Vaglio**
*University of Bergamo and CRIOS Bocconi University,
**University of Bergamo

Abstract

PRELIMINARY DRAFT In the present paper we attempt to figure out the economic reasons why people spend time watching television, reading newspapers, listening to the radio and connecting to the web. We use data from the European Social Survey (ESS) Round 5 – 2010 and from other minor empirical sources. The analysis carried out confirmed the theoretical points we started with. In fact, the use of media is actually related to a number of variables which reflect opportunity costs and tastes of the individuals. By means of a Tobit regression, we show that the education level and the family income encourage media use. Furthermore, socio-economic factors and media freedom deeply affects individuals resorting to media. Finally, the complementarity among different sources of information is investigated.

JEL code: L82, L83

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1   Introduction

Why do persons spend some non-negligible share of their time watching television, reading newspapers, listening to the radio and connecting to the web? The fact that such practices are widespread across all population neither does mean that the issue is an idle one nor that we know all we should about it. On the contrary, the demand for media use has rarely been investigated for economic research purposes, while marketing research has at least focused on media (and advertising) penetration with an evident business-oriented motivation.

In this paper we provide a tentative answer to the opening question. Our general theoretical perspective is that media use is the outcome of

a decision process which, like any other such process in economics, takes into account costs and benefits of the use of media in general, and of each specific medium. Time is the most important component of the cost of using the media, and the cost of time depends on a wide range of individual related characteristics, including opportunity cost measures such as wage (for those with a job), but extending far beyond these. For instance, education may affect the time required to process a given piece information, thereby making information gathering less costly for educated individuals. It should be noticed that not all media require the same level of time consumption. Moreover, it is possible that the allocation of time to the web actually conceals a *net* saving of time, thanks to the services provided through the web itself.

Turning to benefits, they depend both on personal tastes (possibly related to some observable characteristics, such as age or sex, or again the level of education) and on the characteristics of the available media services. The latter must be understood not only in the sense that, for example, TV differs from newspapers in an intrinsic way, but also in the sense that the same medium provides services whose quantity and quality varies across countries. Finally the general environment the individual lives may provide different motivations to make use of the media: as an extreme example, in a dictatorship, elections as an incentive to get informed are missing for all individuals.

In the second part of the paper we investigate individual behavior as regards the joint use of different media. We think that using more than one medium is something more than the simple taste for variety, which applies more precisely to entertainment purposes. It is instead a specific way of exploiting the benefits of pluralism, i.e. the availability of more sources of information: individuals who use media in a complementary way, extract additional information from comparison of different voices. We expect that the same variables explaining the resort to individual media also influence the propensity to use then in a complementary way.

Although we shall include in our analysis a wide range of covariates, we should stress that our focus variable is the individual education. As we already stressed., it affects both cost and perceived benefits from using the media.

We use data from the European Social Survey (ESS) Round 5 – 2010, covering 27 countries, and from other minor sources to empirically map what we think are the main determinants of the demand for TV, newspapers and radio services an of the use of the web. We employ Ordered Probit techniques to explain the allocation of time to each specific medium.

As a short preview of our findings, we mention that education positively affects the use of the web and also of traditional media, when the individual purpose is getting informed rather than entertainment. Secondly, the evidence suggests that the availability of time influences to a significant extent the pattern of media use, although a direct measure of the opportunity cost of time is not available in our dataset. The economic and social status of the individual has also a significant impact on the use of media. Finally, country-level variables are found to exert a systematic effect on individual behavior.

1.1   Related literature

Modern economic literature addresses media markets as a multi-sided industry, characterized by multiple groups of players (e.g. readers, viewers, advertisers, content producers, journalists, platform owners and so forth).[1] In this respect media market are analyzed by the two-sided approach. See, for instance, the seminal paper due to Anderson and Coate (2005) for a theoretical model on broadcasting. While for what concerns the empirical literature see e.g., Brown and Alexander (2005), Kaiser and Wright (2006), Argentesi and Filistrucchi (2007), Kaiser and Song (2009), Rennhoff and Wilbur (2012, 2014) and Hiller et al. (2014).

However, in this approach, the demand of information and entertainment, at an individual basis, has received rather little study. In the political economy literature, where voting decision are considered, there is a deeper emphasis of demand side, eventhough the main concern is not on news/entertainment provision, but on media bias and capture. See Mullainathan-Shleifer (2005), McCluskey-Swinnen (2007) and Anderson-McLaren (2010) for theoretical contributions and Larcinese (2009) for an empirical one.

More generally, at empirical level, it lacks an exhaustive analysis to explain the reasons why individuals resort to media, taking into account individual benefits and costs. A remarkable exemption is due to the analysis of the individual use of time on internet, e.g. Waldfogel (2002), Sinai and Waldfogel (2004), Goel et al. (2006), Goldfarb and Prince (2008), Chapela (2014) and Pantea and Martens (2014) and Molina, Campana, Ortega (2015). Furthermore, some recent work has been concentrated on the individual preferences over contents, e.g. Esteves-Sorenson and Perretti (2012), Hiller, Savage and Waldman (2014) and Melki and Pickering (2014). It also worth of noticing that there exist a relevant literature on economic of happiness linked to the media consumption, see for instance: Gui and Stanca (2009) and Juncal Cuñado and Pérez de Gracia (2012). However these papers deals with the im-

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[1]For a survey on media market literature, see Battaggion, Vaglio (2015a).

pact of media consumption on the individual utility, but they neglect the impact of consumers behavior on the media markets.

The paper is organized as follows. In section 2 we expose our conceptual framework of reference. In section 3 the dataset is described. Econometric analysis and the results are discussed in sections 4 and 5 respectively as regards the separate use and the joint use of media. A final section contains the conclusions.

2   The model

As we said in the Introduction, we view the media-related behavior of individuals as the outcome of a choice process where individuals contrast costs and benefits of accessing specific media.[2] Suppose there exist N media. In a simple formalization, we can say that the individual k gets utility U_i^k from the use of the $i-th$ medium

$$U_i^k = \left(V_i^k \left(\mathbf{q}_i \right) - C_i^k \left(\mathbf{x}^k \right) \right) t_i \tag{1}$$

where $\mathbf{q}_i$ is a vector of medium-specific characteristics and $\mathbf{x}^k$ a vector of individual characteristics. $V_i^k \left(. \right)$ is a value-function for the i-th medium with respect to the k-th individual and $C_i'^k$ is a cost function for the $k-$th individual relative to the $i-$th medium. t_i is time devoted to the $i-$th medium. The total utility that the individual gets from resorting to media is

$$U^{km} = U^m \left(U_1^k, U_2^k, ..., U_N^k \right) \tag{2}$$

Moreover, the individual gets a utility

$$w_k t \tag{3}$$

from non-media related time, t, where for simplicity we consider w_k as a (individual-specific) constant. The total utility for individual k will then be

$$U^k = W \left(U^m \left(U_1^k, U_2^k, ..., U_N^k \right), w_k t \right) \tag{4}$$

which the individual maximizes under the constraints

$$t_i, t \geq 0$$

$$\sum_{i=1}^{N} t_i + t \leq T \tag{5}$$

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[2]In this perspective, see Battaggion and Vaglio (2015b) for a theoretical model.

where T is total available time. The first order condition for the $i-$th medium is:

$$\frac{W_m U_i^m}{U_{knm}} \left(V_i^k\left(\mathbf{q}_i\right) - C_i^k\left(\mathbf{x}^k\right)\right) \leq w_k \qquad (6)$$

Hence the individual time allocation function for media i is as follows:

$$t_i^k = t_i\left(\mathbf{q}_i, \mathbf{x}^k, w_k\right) \qquad (7)$$

When (6) holds as an equality, then some positive time is allocated to medium i, otherwise that medium is neglected. This last condition illustrates to a large extent the main themes of our work. First, the opportunity cost of time (w_k) impacts to some extent on the use of all media (assuming that any individual allocates some time to non-media uses).The responsiveness of the demand for medium i with respect to changes in w_k depends on the shape of the utility function. Secondly, in determining the time devoted to a given medium, the match between medium properties ($\mathbf{q}_i$) and individual characteristics $\mathbf{x}^k$ is crucial (see the term $V_i^k\left(\mathbf{q}_i\right) - C_i^{\prime k}\left(\mathbf{x}^k\right)$) The most illuminating example that comes to mind is represented by the web. This medium has some features in common with traditional media (and with most of them at the same time: on the web, you can read, listen and watch; you can find information as well as for any kind of contents other than news). On top of this, the web allows for interaction, which is absent in more traditional media; the web allows for an *embarrass des richesses* as regards the availability of contents outlets; the use of it requires a minimum technical ability which nowadays still represents a barrier for most elderly potential users. So, some individuals will find themselves well at ease with all the characteristics of the web, some other individuals will appreciate just some of them, and still some other will refuse using the web.

According to the theoretical model, we consider as the dependent variable the time devoted to each medium, t_i. As it will be described in more detail below, our dataset reports individual answers to questions of the type: "How much time do you usually devote to...?". The answer is provided in discrete terms (e.g. 0 to thirty minutes a day, or thirty minutes to an hour, etc.). Also, data distinguish between total time devoted to a given medium and time devoted more specifically to news, politics and current affairs (rather than to more entertainment-motivated use of media). Unfortunately, the distinction between news-motivated and entertainment-based use of media is only available for TV, newspapers and radio, but not for the web.

3 Data

The data set we use comes from the European Social Survey (ESS) Round 5 – 2010. The ESS is an academically-driven multi-country survey that has been conducted every two years across Europe since 2001. Its first aim is to monitor and interpret changing public attitudes and values within Europe and to develop a series of European social indicators, including attitudinal indicators. In the fifth round, the survey covers 27 countries.[3] We exclude from the analysis Russia, Ukraine and Israel, in order keep a sufficient level of geographical and institutional homogeneity in the sample. The survey provides, on individual basis, information on media consumption, demographics and socioeconomics variables, political interest, participation and trust. The units of analysis are the individuals aged 15 and over resident within private households in the participating countries. The survey data is organized as a cross section and the total number of questionnaires achieved, in the period September 1st, 2010 – December 31st 2010, is 52.458.

3.1 Dependent variables

To measure individual attitude to resort to media, we basically utilize four variables from the ESS 2010. The first one, TVTOT, indicates the total time of TV watching on average weekday. The second variable, NWSPTOT, is the total time of newspaper reading on average weekday. Analogously, the third variable, RDTOT, is the total time of radio listening on average weekday. Finally, variable NETUSE indicates the number of internet access for personal use on a monthly base.

Then, according to our research questions, we disentangle the previous three variables to distinguish the use of media for information and for entertainment. Therefore, we label our variables with the extension "POL" to indicate the time devoted to news/policy/current affairs on an average weekday respectively for TV, newspaper and radio (TVPOL, NEWSPPOL, RDPOL). Unfortunately, ESS5 report the total recreational use of internet, without distinguishing the time devote to entertainment and information, which make us unable to distinguish among the different use of the internet platform.

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[3]Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Lithuania, Netherlands, Norway, Poland, Portugal, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom and Ukraine.

3.2 Explanatory variables

As we stated in Section 2 the utility of resorting to media depends on two main categories, the former related to media characteristics, the latter to the individual features. Starting from the individual characteristics, we expect all demographic variables, namely the age of the respondent (AGE), the gender (SEX, dummy variable, value 1 for female), the mother tongue (TONGUE , dummy variable, 1 if the respondent speaks one of the country's official languages), the fact of being resident (CITIZEN1 dummy variable, 1 if country's citizen) or belonging to an ethnic minority (ETHNIC_MINORITY, dummy variable, 1 if belonging to a minority) and being of age to vote (VOTINGRIGHT, dummy variable, 1 if entitled to vote) matter. In particular, we might assume that age should be inversely related to an increased use of less traditional media (e.g. the web). While language is expected to be more important for more speech-centered media (such as radio or newspaper) relative to TV, but much depends on the existence of special programs or on the degree of "internationalization" of the medium (the web). We also consider variables related to the respondent's education level, as well as the education levels of his/her parents (measured in years of education): respectively EDUCATION, EDUCATION_F and EDUCATION_M. We introduce an index of per capita family income (INCOMEFAMILY_PROC), and the number of children aged less than six (LESSTHANSIX).

Up to this point, we have analyzed the individual (and household) features which explain different attitudes and costs of resorting to media. Hereafter in this Section we introduce variables characterizing the respondent's country from a number of viewpoints. First, we introduce an index of freedom in media market. Variable FREE measures the degree of freedom in media market according to the World Press Freedom Index 2010. We expect more freedom to encourage the use of media, although it is possible that some media are perceived as more free than other, so that for example in a country where TV and newspaper journalist are controlled and oppressed, one might resort to web information. For what concerns the sociopolitical environment we introduce variables which refer to the political incentive to get informed. TURNOUT measures the average election turnout in the time span 2005-2010 (source: Institute for Democracy and Electoral Assistance– IDEA). From the same dataset IDEA, we have also introduced a dummy variable in the case of election (Parliament or President) in the year ELECTION2011 (?). We expect that electoral appointments, for the near future, increase the utility of acquiring information. Finally COUNTRYSIZE (population size-The world factbook 2014) and GDPPRO (Per capita GDP in PPP-World Bank 2014) provide a broad characterization of the respondent's

Table 1						
	TVTOT	**TVPOL**	**NWSPTOT**	**NWSPPOL**	**RDTOT**	**RDPOL**
Number of observations	52,431	52,404	52,429	52,354	52,412	51,997
Total time on | average weekday	Percent	Percent	Percent	Percent	Percent	Percent
No time at all	4.13	12.35	34.84	44.54	28.73	42.48
Less than 0,5 hour	4.93	31.32	29.04	39.51	14.44	30.96
0,5 hour to 1 hour	12.70	34.77	24.21	12.12	15.15	15.25
More than 1 hour, up to 1,5 hours	12.84	11.92	6.78	2.44	7.70	4.84
More than 1,5 hours, up to 2 hours	16.25	5.05	3.05	0.88	6.38	2.54
More than 2 hours, up to 2,5 hours	12.56	2.08	1.00	0.24	3.79	1.14
More than 2,5 hours, up to 3 hours	12.53	1.03	0.45	0.12	3.66	0.79
More than 3 hours	24.05	1.48	0.62	0.15	20.17	1.99
Total	100.00	100.00	100.00	100.00	100.00	100.00

Table 2	
	NETUSE
Number of observations	52,422
Personal use of internet/e-mail/www	Percent
No access at home or work	25.08
Never use	13.33
Less than once a month	1.25
Once a month	1.03
Several times a month	2.56
Once a week	3.46
Several times a week	11.76
Every day	41.53
Total	100.00

country.

We consider the general environment, where people live, with particular references to the weather conditions. Eventhough, we have fairly loose expectations on these variables. For instance, a better climate might encourage more outdoor activities, implying a reduced resort to media. On the other, exceptional weather events might increase the need for information. Therefore we do consider the yearly average temperature, TEMP, and the yearly average precipitation, PRECIP, from the Weatherbase dataset. Then, we control for country effects.

Finally, the following Tables 1 and 2 illustrate the descriptive statistics for the dependent variables.

Let us just remark that studying the web as a medium would require some very sophisticated information about the actual use of the medium itself. Our data, unfortunately, provide not-so-refined an information, simply requiring how many times the individual accesses the web for reasons not related to work or study. It is interesting to note that the distribution of NETUSE is clearly bi-modal, with 38% of the sample never using the web and 52% using it several times a week or everyday.

4 Separate use of media

In this section we separately analyze the determinants of the use of each specific medium. The core structural equation is:

$$
\begin{aligned}
Medium = \gamma_0 + \gamma_1 age + \gamma_2 sex + \gamma_3 ethnic\_min.+\\
\gamma_4 tongue + \gamma_5 votringht + \gamma_6 citizen + \gamma_7 education+\\
\gamma_8 inc\_family\_proc + \gamma_9 free + \gamma_{10} countrysize + \gamma_{11} GDPpro+\\
\gamma_{12} turnout + \gamma_{13} election11 + \gamma_{14} temp + \gamma_{15} precip + \gamma_{16} EUtrans
\end{aligned}
\tag{8}
$$

which is the estimable counterpart of equation (7). By "medium" we mean the dependent variables (TVTOT, TVPOL, NWSPTOT, NWSP-POL, RADIOTOT, RADIOPOL, NETUSE). We have a latent variable (the minutes addressed to the consumption of each media) which is not observable. While we observe the score attached to each interval of medium consumption. In other words, our dependent variable is continuos, but we can only observe its discrete realizations, with an ordinal interpretation. Ordered Probit represents the most readily available technique. In this framework, the probability of each outcome (conditional on the independent variables) is normally distributed.

Among the regressors in equation (8) we can safely consider exogenously given those referring to the country characteristics as well as demographic characteristics. In addition to the explanatory variables referred to country level characteristics, we introduce in this equation an additional dummy (EUTRANS) which is 1 for individuals living in formerly socialist European countries. We think that this dummy might capture some historical and institutional features which differentiate these countries from the remainder of the sample.

Individual education raises doubts as regards endogeneity. Then we need to provide a set of instrumental variables to deal with this endogeneity. Instrumental variable estimation is possible given the fact that the endogenous variable can be regarded as continuous. Thus, we

augment our model by adding one further structural equation, namely:

$$education = \alpha_0 + \alpha_1 age + \alpha_2 sex + \alpha_3 ethnic\_min. + \alpha_3 citizen +$$
$$\alpha_5 tongue + \alpha_6 education\_m + \alpha_7 education\_f + \alpha_8 orphan\_m +$$
$$\alpha_9 orphan\_f + \alpha_{10} high\_m + \alpha_{11} high\_f + \alpha_{12} whitecoll\_f + \quad (9)$$
$$\alpha_{13} whitecoll\_m + \alpha_{14} blu\,\mathrm{col}\,l\_f + \alpha_{15} blues\,\mathrm{col}\,l\_m +$$
$$\alpha_{16} farm\_f + \alpha_{17} farm\_m$$

Equation (9) explains the individual education by means of parents' education levels (EDUCATION_F and EDUCATION_M) and professional status when the respondent was fourteen, (HIGH_M, HIGH_F, WHITECOLL_M, WHITECOLL_F, BLUECOLL_M, BLUECOLL_F, FARM_F, FARM_M). ORPHAN_M and ORPHAN_F are 1 if the respondent was respectively motherless or fatherless at the same age. In addition to the mentioned regressors the equation includes country dummies.

Table 3 shows the estimation results for the first-stage equation. The instruments chosen for EDUCATION prove generally significant , while signs support a reasonable interpretation, with educated and professionally skilled parents predicting highly educated children.

Table 4 shows the Probit estimates for the different media considered. Before describing results, let us point out the outcome of the Wald test of exogeneity in the last line (obtained by regressing the Probit residuals against the residuals from the first-stage equation), which rejects the null hypothesis of exogeneity, confirming the appropriateness of the IV procedure.

- Education positively affects media use when this is news-oriented (TVPOL, NWSPTOT NWSPPOL, RDPOL) and negatively when it is more entertainment oriented (TVTOT; RDTOT is barely significant).

- NETUSE is positively affected by education, but here the interpretation is a bit more complex,

- The variables RETIRED and LESSTHANSIX can be viewed as indicating different constraints on the use of time Traditional media (with the exception of the radio) are used more by retired persons and less in families with little children. (with RDPOL the signs are inverted and significant, while in RDTOT both are non significant). As regard NETUSE, retired persons use it less, while the number of children has no impact.

Table 3		
EDUCATION		
age	-.0274175	***
sex	-.0598751	*
ethnic_min	-.5451677	***
citizen	-.4176727	***
tongue	.4124775	***
education_m	.2319655	***
education_f	.3764469	***
orphan_m	-.3768419	**
orphan_f	.3256483	**
high_m	-.1514758	*
high_f	1.640.694	***
whitecoll_f	1.418.424	***
whitecoll_m	.1426224	**
bluecoll_f	.8429787	***
bluecoll_m	.1252855	*
farm_m	-.1966869	***
farm_f	-.1879672	*
	Number of obs = 40434	
	Prob > F = 0.0000	
	R-squared = 0.2879	
	Adj R-squared = 0.2757	
	Root MSE = 3.3346	

Table 4													
	TVTOT		TVPOL		NWSPTOT		NWSPPOL		RDTOT		RDPOL		NETUSE	
age	.0034634	***	.0188427	***	-.0008049		.0111182	***	.0136058	***	.008344	***	-.0289832	***
sex	.0252708	*	-.1564296	***	-.149865	***	-.2049111	***	-.0727595	***	-.1409347	***	-.0456592	**
vote_right	-.0104175		.1861275	***	.1387246	***	.1851074	***	.2925992	***	.3578849	***	.0712853	*
ethnic_min	.0178818		.1203906	***	-.0464679		.0189005		-.3109799	***	-.2065966	***	-.0712049	*
citizen	.0632647	*	-.0877374	*	.0918561	*	.0743317	*	.014516		-.0149337		.1129684	*
tongue	.010063		.1254323	***	.0566055	*	.0386261		.1820534	***	.1279809	***	.0313554	
education_iv	-.020253	***	.0279233	***	.0543637	***	.0796001	***	-.0080503	*	.0282318	***	.193045	***
inc_familyproc	-.0222514	***	.0058801		.0492399	***	.0627801	***	.0379545	***	.0380624	***	.1722619	***
lessthan6	-.0506687	***	-.038428	**	-.0756815	***	-.044919	**	-.0096579		.0312968	*	.0107755	
retired	.165547	***	.1199236	***	.1656575	***	.072442		-.0104811		-.0651654	**	-.2407077	***
gdppro	-1.25e-07		5.49e-06	**	1.79e-06		.0000103	***	-6.90e-06	**	1.12e-07		6.09e-06	**
countrysize	-8.92e-07	**	-9.43e-07	**	-5.35e-07	*	-7.26e-07	***	1.38e-06	***	2.86e-06	***	-4.72e-07	
free	.0079673	***	-.0086366	***	.0221502	***	.0175832	***	.0362972	***	.0392759	***	.0064843	**
turnout	-.0027605	**	.006305		.0005669		.0021414		.0035782	***	.0057121	***	.0075094	***
precip	.000102	*	-.0002288	***	.0005912	***	.0002305	***	.0006683	***	.0005244	***	.0003624	***
temp	.0273513	***	-.0193886	***	-.0335987	***	-.0289929	***	.0204447	***	.0043083		-.0336985	***
election11	-.0471949	**	.1539779	***	.114476	***	.1915202	***	-.0164925		.1502417	***	.1837744	***
Eutrans	-.0002335		-.0105212		.0159367		.0245132		.117779	**	.2171465	***	-.2345266	***
Number of obs	30888		30885		30896		30868		30893		30785		30893	
Wald test	P>|t|		P>|t|		P>|t|		P>|t|		P>|t|		P>|t|		P>|t|	
r1	0.000		0.011		0.000		0.000		0.001		0.000		0.000	
*** p < 0.01, ** p < 0.05, * p < 0.1														

- Family income seems to exert a positive influence on media use, with the exception of television.(the effect on TVTOT is negative and on TVPOL is non significant). The country per capita GDP significantly affects some individual choices, encouraging the use of TVPOL, NWSPPOL, and NETUse, while the effect negative or nonsignificant in other cases.

- Turning to the personal and demographic variables, the use of traditional media generally increases with age (with RDTOT is nonsignificant), while the opposite is true for the web. As regards SEX, the exception is represented by TVTOT, which is larger for females, while the use of all the remaining media is larger for males.

- Being a speaker of the country tongue favorably influences the use of radio, while in all the remaining cases, the effect is nonsignificant or barely significant.

- The effect of being part of an ethnic minority is ambiguous. The point is that ethnic minorities can be very different across countries: some can be socially or economically disadvantaged , while in some other cases can instead be privileged minorities; the pure effect of language is already captured by TONGUE, so that the overall effect is open to debate.

- Variables concerning political motivation and the political environment have a rather meaningful impact on media use. Individuals holding the right to vote make a comparatively larger use of all media (excluding TVTOT) while the role of citizenship is less clear. Generally speaking, as regards the political environment, countries with large turnout rates and where elections were expected for next year tend to encourage the use of media for information purpose, and the web. The effect on TVTOT, and RDTOT is either negative or not significant. Moreover, with the usual exception of television (for information purposes) , media freedom encourages the use of all media.

- Meteorological variables are generally significant, with an ambiguous interpretation. Analogously, the impact of COUNTRYSIZE is mixed and not easily interpretable.

5 Joint use of media

In the previous sections we considered the demand for each medium separately. However, our descriptive statistics show that most individuals

Table 5		
	MediaTOT	**MediaPOL**
Number of observations	52343	51850
	Percent	
No medium	0.33	1.82
1 medium	6.30	12.36
2 media	18.51	23.65
3 media	35.47	32.62
4 media	39.39	29.55
Total	100.00	100.00

resort to more media. Table 5 describes the percentage of individuals using one single source (1 medium), two, three and four sources respectively (2,3,4 media) and the individuals not resorting to any media (No medium), where MediaTOT refers to all our sources (TVTOT, NWSPTOT, NETUSE and RDTOT), while MediaPOL refers to the political information (TVPOL, NWSPPOL, NETUSE and RDPOL).

Therefore, we define a new set of variables representing the joint use of different media. We then investigate the relationship between these newly defined variables and the covariates we employed so far, by means of Ordered Probit. Again, education is measured by the EDUCATION_IV as defined in the previous sections.

For each of the previously defined dependent variable (TVTOT, NWSPTOT, RDTOT, NETUSE, TVPOL, NWSPPOL, RDPOL) we reclassified observations into three intervals: individuals who do not use the medium at all; individuals whose use of the medium lies between zero and the median value (moderate users); individuals whose use of the medium lies above the median value (intensive users). These variables are called with the same name as before, with the extension _three (TVTOT_three, TVPOL_three, NWSPTOT_three, RDTOT_three, NETUSE_three, TVPOL_three, NWSPPOL_three, RDPOL_three).

Now consider, for instance, TVTOT and NWSPTOT. Then we define PLURALNWSPTV_NORM as follows:

- 0 (No Information) if the individual does not use any of the two media.

- 1 (Specialization) if the individual uses just one of the two media.

- 2 (Moderate Pluralism) if the individual is a user of both media, but in at least one case is a moderate user.

Table 6	pluralnetnwsp_norm	pluralnettv_norm	pluralnwsptv_norm	pluralnetnwsppol_norm	pluralnettvpol_norm	pluralnwsppoltvpol_norm	pluralrdtv_norm	pluralrdpoltvpol_norm
Number of observations	52,399	52,398	52,399	52,325	52,371	52,311	52,394	51,956
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
No information	10.78	1.05	1.97	13.20	2.87	8.93	1.57	8.29
Specialization	38.34	27.11	35.02	43.18	31.68	39.01	29.69	38.27
Moderate pluralism	31.88	50.15	43.73	35.29	56.10	45.11	47.25	44.52
Intensive pluralism	19.00	21.69	19.28	8.33	9.35	6.95	21.48	8.93
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

- 3 (Intensive Pluralism) if the individual is an intensive user of both media.

The values are then normalized to the (0,1) interval.

The corresponding variables are created for the following pairs: PLURALNETNWSP_NORM, PLURALNETTV_NORM, PLURALNETNWSPPOL_NORM, PLURALNETTVPOL_NORM, PLURALNWSPPOLTVPOL_NORM, PLURALRDTV_NORM, PLURALRDPOLTVPOL_NORM.

Table 5 contains the descriptive statistics concerning these variables.

From the estimation results (contained in tables 7 and 8) clearly emerge the following findings.

- At a first glance, joint use of media is positively related to the individual education level and to the family income, with the only exception of the joint use of television and radio where education is not significant.

- As a rule, AGE and SEX are significant. If we consider the complementarity between the web and other media, such a complementarity decreases with age, with the exception of complementarity between NETUSE and NEWSPPOL , where age is not significant. Moreover, complementarity between traditional media increases with age. As regards SEX, women exploit less than men complementarity in the use of media, the only exception being complementarity between NETUSE and TVTOT, where SEX is not significant.

- Elections in the next future (ELECTION11), general political participation (TURNOUT), and media freedom (FREE) all positively

Table 7	pluralnetnwsp_norm		pluralnettv_norm		pluralnwsptv_norm		pluralrdtv_norm	
age	-.0045975	***	-.0151701	***	.0092202	***	.0017482	**
sex	-.1116613	***	-.0024152		-.10764	***	-.0710971	***
vote_right	.2211786	***	.1300855	***	.0823897	*	.2184544	***
ethnic_min	-.0859412	**	-.1128778	***	-.0853231	**	-.2359806	***
citizen	.083305	*	-.0176394		.1129352	**	.0949445	*
tongue	.0806026	*	.087285	*	.1066299	**	.158169	***
education_iv	.0963711	***	.0677466	***	.0240828	***	.0015149	
inc_familyproc	.1216114	***	.0889628	***	.0296817	***	.0247766	***
lessthan6	-.0325737	*	-.0120004		-.0697517	***	-.0218546	
retired	-.2379493	***	-.2426265	***	.1957407	***	.0774063	***
gdppro	.0000111	***	-2.70e-06		4.17e-06	*	-2.96e-06	
countrysize	-1.87e-07		3.65e-07		1.08e-06	**	9.76e-07	**
free	.0177883	***	.013713	***	.0162954	***	.0324216	***
turnout	.0034842	***	.0085328	***	.0033861	***	.0045986	***
precip	.000476	***	.0003695	***	.0003619	***	.0004925	***
temp	-.0403386	***	-.0059731	*	-.0359182	***	.0256497	***
election11	.1771223	***	.0555169	***	.0886726	***	-.0532045	***
Eutrans	.0067741		-.0870123	*	.1600544	***	.1906035	***
Number of obs =	30889		30887		30890		30889	
Wald test	P>|t|		P>|t|		P>|t|		P>|t|	
r1	0.000		0.000		0.000		0.000	
*** p < 0.01, ** p < 0.05, * p < 0.1								

Table 8	pluralnetnwsppol_norm		pluralnettvpol_norm		pluralnwsppoltvpol_norm		pluralrdpoltvpol_norm	
age	-.0006035		-.0028957	***	.0155361	***	.0119581	***
sex	-.1459628	***	-.0892392	***	-.1972342	***	-.1685314	***
vote_right	.2219292	***	.2531981	***	.2032787	***	.3256311	***
ethnic_min	-.0472836		-.0322278		.0127702		-.122768	***
citizen	.0643575	*	-.0332029		.0842514	*	.0328088	
tongue	.0836055	*	.1357278	***	.1193359	**	.1892227	***
education_iv	.1096602	***	.0827064	***	.0577323	***	.0309418	***
inc_familyproc	.124913	***	.1042632	***	.0566215	***	.0393033	***
lessthan6	-.0042597		.0075496		-.0344787	*	.0176256	
retired	-.2363219	***	-.3032694	***	.0347459	*	-.0308811	
gdppro	.000013	***	7.04e-06	**	.0000156	***	7.77e-06	***
countrysize	-3.92e-08		9.51e-07	**	5.06e-07		2.85e-06	***
free	.0161998	***	.0127327	***	.013565	***	.0316861	***
turnout	.0053375	***	.0099099	***	.0046589	***	.008545	***
precip	.00032	***	.0001762	**	7.24e-06		.0003111	***
temp	-.0346805	***	-.013659	***	-.0289416	***	.0010936	
election11	.2266673	***	.2023174	***	.2068118	***	.1729103	***
Eutrans	-.0197943		.0117395		.2064468	***	.3645314	***
Number of obs =	30861		30877		30857		30774	
Wald test	P>|t|		P>|t|		P>|t|		P>|t|	
r1	0.000		0.000		0.000		0.000	
*** p < 0.01, ** p < 0.05, * p < 0.1								

influence the joint use of different media. Individuals entitled to vote are consistently more inclined to use jointly different media.(ELECTION11 negatively affects the complementarity between RDTOT and TVTOT).

- Retired persons do not use combinations of web and other media. Instead they intensively use combinations of traditional media, with the exception of TV and radio for information purposes. Conversely, persons living in families with a large number of pre-school age children show, if any, a low propensity to joint use of media.

6   Conclusions

The analysis carried out in this paper confirmed as a whole the most important theoretical points we started with. The use of media is actually related to a number of variables which *reflect time constraints* and tastes of the individuals. One of the clearest findings of the paper concerns the role of education as a factor stimulating the search for news through the media and to use more than one medium for this purpose. This effect is in principle twofold: education increases the ability of processing and elaborating information, and therefore reduces the costs of using the media (possibly, in a more marked way with media with complex messages, i.e. newspapers vs TV, something which our empirical analysis supports). At the same time, education might make the use of media more attractive, both in general and for specific media, independently of opportunity cost considerations. Family income exerts a positive influence on the use of media. Since we cannot attribute to this measure of income any meaning in terms of opportunity cost of time, this finding signals a income effect in a broad sense.

Another meaningful result is that in general, time constraints matter, both as regards the separate use of media and the joint resort to sources of information.. First, the number of little children in the family adversely affects the use of media..If we interpret families with children as *care-demanding* environments, this result would witness that time scarcity conditions in a relevant way the use of media. Second, retired persons certainly face a softer time constraint relative to working individuals, and this shows in an increased propensity to use (traditional) media. Notice that since we control for age, we can disentangle the pure effect of retirement.

The effect of variables related to the political incentives and the media system is significant. Press freedom, and factors such as elections, general turnout and the right to vote have an unambiguous positive

influence on the use of media and information gathering, since these variables affect the value of information.

The main implication we can draw from the previous analysis is that understanding one country's media system requires the inspection of the level and the distribution of education across the population and the socioeconomic condition of individuals. These factors, influencing both the absolute size and the composition of the media demand, contribute to determine the scope for pluralism. The interplay among these demand-side factors and country-wide factors such as media freedom and opportunities for political participation shapes the overall structure of the media system.

Although the results obtained are stimulating, the analysis suggests that crucial issues might be thoroughly addressed by means of more extensive and refined data: for instance, a finer description of web use, distinguishing not only news from entertainment, but also from time devoted to get services, and high-quality data on individual opportunity costs.

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