Factoring media use into media system theory—An examination of 14 European nations (2002–2010)

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Abstract
This study incorporates media use pattern into examining three distinct media systems proposed by Hallin and Mancini. The uses of newspapers, radio, television, and Internet in European Social Surveys were included. North-Central European nations, particularly the Nordic countries, demonstrate more widespread media use than other European nations. Media-use Gini indexes support Hallin and Mancini's original demarcation. Cluster analysis, however, indicates that the European nations of the three groups slightly differ from the original typology.

Keywords
Cluster analysis, European media, European Social Survey, Gini index, media system, media use, typology

How the press operates in different parts of the world always intrigues communication researchers. The potential differences certainly matter greatly to how each societal and political system functions. Various typologies and categories (e.g., Siebert et al., 1956) of media systems were created in the 20th century. But few of them seemed to survive the empirical test and serve the function of meaningful comparison well. Recently, the demarcation of distinct media systems in the West proposed by Hallin and Mancini (2004) has rekindled significant scholarly

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attention and interest. Their book sheds light on the underpinning structure and shared attributes of the media landscape in Europe, finding regularity while others merely see chaotic national idiosyncrasies.

The main thesis of Hallin and Mancini's *Comparing Media Systems* is that three differentiated media systems co-exist in Western democracies, namely the Liberal or North Atlantic model, typical of the United Kingdom, Ireland, the United States, and Canada; the Democratic Corporatist model, which exists in Central and Northern Europe (Netherlands, Belgium, Austria, Switzerland, Germany, Denmark, Sweden, Norway, and Finland); and, lastly, the Polarized Pluralist model, which includes Mediterranean countries, such as Spain, Portugal, Greece, Italy, and France. The distinction among the three is finer than the conventional counterparts that were delineated earlier but appears to resonate well with recent scholarly observations.

These distinct media systems are, according to Hallin and Mancini, the historical product of four evolving sociopolitical structures: first, the media markets, more specifically the development of a mass press; secondly, political parallelism, or the way the media reflect and reinforce the major political divisions of society; third, the level of journalists' professionalization; and lastly, the nature and extent of state's intervention in the media system.

Contrary to other attempts in establishing classification of national media structures—for example, Siebert et al. (1956) and Hachten and Scotton (2012)—Hallin and Mancini's taxonomy is not based on normative or ideological grounds, but is derived from observations of how media developed as institutions under different social settings and historical contexts. However, their taxonomy has been criticized as 'fuzzy, impressionistic and unscientific' (Norris, 2010: 12) for its lack of standardized indicators to allow researchers to test and verify. Additionally, Norris contends that new media should have been included in the equation, arguing that Internet use should represent a significant facet of each media system. It is the reason why we intend to include this important part of media use into our examination of the media systems in Europe.

Despite a brief description of newspaper and television uses across European countries in their book's second chapter, Hallin and Mancini did not truly incorporate the media use factor into consideration. We argue that media use is an indispensable dimension of any media market that should be included in any meaningful taxonomy. For any identifiable media system should be distinguished from not only its content providers, media policies and laws, content produced and distributed, but also access and usage. Given how the media market works in the West (Meehan, 2007), audiences may very well play a pivotal role in determining how and why certain content is created and circulated. Therefore, the media use factor has the potential to become the key mosaic in completing the picture of demarcating distinctive media systems and consequently we think it should be seriously considered.

This article intends to fill the gap by empirically examining Hallin and Mancini's taxonomy of Western media systems with longitudinal data gathered from

14 European nations. Our data allows us to examine whether, and how well, each of the European countries will fit with Hallin and Mancini's original categorization (e.g., Belgium and France were originally considered straddling between two systems). Moreover, media use, an integral part of any media system, is incorporated into the examination. Hallin and Mancini directed their attention toward the supply side, while the demand side of the media was mostly ignored. Also, in responding to one of the criticisms of the taxonomy, this article includes the Internet use variable, which may help unveil the difference among the media systems.

Literature review

The differences in media systems around the world have triggered various scholarly efforts in categorizing and demarcating countries based on ideologies, economies, and cultures. Siebert et al. (1956) divided the world's media systems into four distinct groups: authoritarian, libertarian, social responsibility, and Soviet communist. With the ever-changing world and blurring distinction between some of the categories, the macro-level typology inevitably faces critique and revision. For example, Hachten and Hachten (1992) revised Siebert et al.'s 'Four Theories' to form 'Five Concepts'. These five concepts are Western, development, revolutionary, authoritarianism, and communism.

As the Berlin Wall collapsed and communism lost its popularity in 1990s, Hachten's 'Five Concepts' needed to be revised again. Meantime, other researchers also created typologies for the world's different media systems, such as Martin and Chaudhary's (1983) three categories ('First World', 'Second World', and 'Third World') that were based primarily on political/development level, and Altschull's (1984) three concepts—'market', 'Marxist', and 'advancing', which is mostly grounded in a country's economic system. Hallin and Mancini's categorization is the first one that appeared in the 21st century and focused almost exclusively on Europe, differentiating it from other typologies. Another distinction of their taxonomy is, though centered on the historical development of media structures across the centuries in Western Europe, it implies differences among the media systems that might influence the consumption patterns of users (Hallin and Mancini, 2004).

Even though Hallin and Mancini (2004) invoked evidences to form their theory of media systems, their approach is primarily qualitative and lacks definite operationalization of the dimensions that differentiate the media systems (Bruggemann et al., 2014). Until recently media scholars did not quantify and gauge the dimensions in media systems and put their model into systemic investigation and verification. Most of the dimensions included in the existing literature, as Hallin and Mancini originally proposed, relate more to the political side, including the political parallelism, journalistic professionalism, and role of the state in media operation (Bruggemann et al., 2014; van Dalen et al., 2012).

Differed readership and media use patterns across the European nations may be another dimension worth examining. Two distinct components of media use

pattern were already mentioned in Hallin and Mancini's (2004) book—historical background and distribution of access. They pointed out that the low level of newspaper readership in the Mediterranean media system has historical roots and remains low in present times; whereas the mass press appeared earlier in the North and Centre of Europe due to Protestantism, which encouraged readership by promoting the printing and distribution of the Bible. News readership not only varies across media systems, but also is unequally distributed within each society. According to Hallin and Mancini, news readership has been particularly low in the Mediterranean countries among women and those who are less educated and have less income.

The widely varied media uses across European nations have also been unveiled by recent empirical studies. Elvestad and Blekesaune (2008), for example, found that the countries of the Democratic Corporatist model show the highest level of newspaper readership in Europe. Demographic variables play different roles in predicting media consumption under different systems—in Mediterranean countries, gender, education, and income are significant predictors of newspaper reading, while gender, age, and income, but not education, play a similar role in the North Atlantic countries; in contrast, in the Northern and Central European countries only age predicts newspaper readership. Within this latter media system, the Scandinavian countries (Denmark, Sweden, Norway, and Finland) enjoy a higher news readership than others in the same group, such as Austria, Belgium, Germany, the Netherlands, and Switzerland. Therefore, the unique media use pattern of Scandinavian countries merits a further look (e.g., Curran et al., 2009; Iyengar et al., 2010; Lund, 2007).

The advent of the Internet in Europe has triggered concerns of traditional media industries (particularly decreasing circulation of print media) and resulted in discovery of altered consumption habits among users (Papathanassopoulos et al., 2013; Van De Wal et al., 2007). One 11-country study (Papathanassopoulos et al., 2013) found that media behavior as well as media cultures differ among the examined countries.

Based on the aforementioned literature reviewed, our first hypothesis is formed:

H1a: Consumption of newspapers is more equally distributed in the Northern and Central Europe countries than the countries in the North Atlantic group and especially than those in the Mediterranean region.

H1b: Of the countries in the Northern and Central European group, the Nordic countries have a more widespread use of newspapers.

With the challenge from the Internet, not only print media but also broadcasters feel the threat to survive. When people have access to a large number of media outlets, each medium is naturally concerned with users' motivation. According to a Dutch study (Wonneberger et al., 2011), TV news exposure is influenced more by

the viewing context than by viewers' motivation. Therefore, the media system in which a broadcaster is based matters greatly to its audience share.

On the bright side of broadcasting industry, data yielded from the European Social Survey showed Europeans still spend more time watching TV news than consuming news of other media. But different media systems within Europe may offer different news menu and steer different viewing habits. Liberalization of media markets, as suggested by Hallin and Mancini, might have resulted in a decreasing consumption of TV news, because TV news tends to be scarcer in such a system. However, research (Aalberg et al., 2013), while finding evidence of a general TV news consumption gap (i.e., an increasing use of TV, paralleled by a decreasing use of TV news) in some European countries, did not find this gap to be distinctive of media systems. Thus, our second hypothesis is:

> H2a: The habit of watching TV news is more widespread than that of reading newspapers.

> H2b: TV news watching does not differ significantly across the media systems in Europe.

The third feature to be included in the characterization of the media systems is the distinctive pattern of Internet use across the groups. In spite of the lack of detailed European-wide statistics on how audiences use the Internet, it is speculated that the Northern European countries have relatively high Internet penetration figures. According to the Eurostat data, the percentage of individuals in the North and Central Europe system who had never used the Internet in 2013 ranged from 3% in Norway to 16% in Austria; whereas in the Mediterranean countries the percentage was as high as 36% in Greece and 14% in France—the latter of which is the least characteristic of the Mediterranean countries, according to Hallin and Mancini's media typology. The United Kingdom and Ireland, countries that represent the North Atlantic model, were somewhat in the middle of the spectrum of Internet penetration. Their penetrations are closer to the North and Central countries, with 8% and 18%, respectively, of their citizens who have never used the Internet.

Furthermore, Northern and Central European countries show a large percentage of users seeking information on the Internet with the purpose of learning. According to Eurostat, the largest percentage of people using the Internet with this goal in mind in 2010 was found in Finland (67%), Norway (57%), and Denmark (56%), compared to 24% in Greece and 29% in Spain. It is worth noting that the numbers in some Northern Central European countries (Netherlands, 19%; Austria, 27%) were lower than that of Spain, a Mediterranean country. The North Atlantic countries' figures (United Kingdom, 29%; Ireland, 35%) are between the Scandinavian and the Southernmost Mediterranean countries. Based on these figures we can conclude that the use of the Internet is more widespread in the Northern and Central European

countries—especially in the Scandinavian countries—than in the Mediterranean counterparts. Hence, our third and last hypothesis is:

> H3: Northern and Central European countries, and especially Scandinavian countries, have a more widespread use of the Internet than the countries in other media systems in Europe.

Each of the mediums discussed above (newspaper, television, and the Internet) may provide additional clues about the characterization of individual countries. It can be fruitful to examine the media system's prediction of use in each of the mediums. We would also like to see whether demographic factors such as gender, age, education, and political interest also contribute to time spent on media. In addition, given the time spent on media can be constant for individuals, it would be interesting to know whether the mediums actually compete with one another. Thus, our first research question is formed:

> RQ1: What factors can predict the time Europeans spent on each of the mediums (newspaper, television news, and the Internet)?

Lastly, we would like to formally incorporate the media use dimension into the theoretical model first developed by Hallin and Mancini. This proposal would naturally require researchers to examine usage patterns of all media across the European countries to yield comprehensive and holistic results—an endeavor the existing literature has yet to pursue (see Bruggemann et al., 2014). Based on this rationale, we formed the following research question:

> RQ2: Do the media use patterns among the European nations actually cluster into the three separate models as described by Hallin and Mancini? And if not, to which group does each country belong?

Method

We used five waves of the European Social Survey (2002, 2004, 2006, 2008, and 2010) to examine the media use factor in distinguishing the European media systems. The European Social Survey (ESS), conducted every 2 years since 2002, provides several significant advantages for us. First, the five waves of the ESS contain the needed data from representative samples of all the countries in the three distinct media systems, except for the two North American states (US and Canada) and Italy (which is only fully represented in the first wave[1]). A total of 14 countries and 10 years of empirical data were included in the present study.[2] The surveys allow comparisons among all the countries individually or grouped into subsets, permitting us to test fitness of the taxonomy developed by Hallin and Mancini. The datasets also allow us to examine the users within individual countries and inspect whether and to what extent the overall media use pattern would fit well with the existing demarcation.

Media use variables

There are two kinds of questions for each of the three traditional news mediums (TV, radio, and newspapers) in the ESS dataset. The first of the questions asks about general media use. For example, for TV, the question goes 'On an average weekday, how much time, in total, do you spend watching TV?' A second media question specifically asks about news use (for TV, the wording is 'And again on an average weekday, how much of your time watching television is spent watching news or programs about politics and current affairs?'). In both cases, respondents are shown a card with nine possible answers.[3]

There is only one question on Internet use in the five waves of the ESS we used. Its wording is completely different from the one on traditional media use. It reads: 'Now, using this card, how often do you use the internet, the World Wide Web or e-mail—whether at home or at work—for your personal use?' where 'personal use' is defined as 'private or recreational use that does not have to do with one's work or occupation'. The answers provided for this question are also different from the ones for the traditional media inquiries.[4] It should be kept in mind that with this question we do not intend to measure news media use, but only how widespread the use of this new medium is in the different media systems.

Multinational research projects often need to address the issues of validity and reliability in data collection across nations. Given the standardized operation across the participated nations, a certain level of reliability could be obtained. To check on validity, the numerical scales of the ESS media use questions were compared to an open-ended question with a 7-point, verbal (and ordinal) scale in pilot experiments conducted in the Netherlands and the United Kingdom. The test results showed that ESS design has achieved similar validity and greater reliability (see Saris and Gallhofer, 2007).

The Gini index

In order to compare media use patterns across media systems in terms of dispersion of news consumption we will use the Gini index. Since 1921 the index has been predominantly used in the field of economics to measure inequality in income distribution within a given population. It has also been used in various fields to measure dispersion (Xu, 2004) but has yet been adopted in the communication field. The range of possible values of the Gini index is from 0 to 1—with 0 denoting no inequality or a perfect distribution (20% of the population owns 20% of the asset; 60% of the population owns 60%, and so on) and 1, complete inequality. The Gini index is easy to understand and its calculation is fairly simple

$$Gini = 1 - \sum (X_i - X_j)(Y_i + Y_j)$$

where X is the cumulative frequency of individuals and Y is the cumulative frequency of the resource. We have calculated the Gini index for each country, ESS

wave and medium (newspaper, TV, and Internet).[5] This gives us a measure of how evenly distributed or widespread each of the mediums is in any country in the dataset. This allows us to test whether countries belonging to the same media system have a similar distribution of media use.

Control variables

Our investigation to predict use of each medium includes a number of independent variables. The media systems are treated as dummy variables in the prediction models. Additionally, we incorporated some control variables commonly used to predict media use, such as gender, age, education, and political interest. Political interest measures how much the surveyed individuals reported they are interested in politics overall. The primary reason why this particular variable was included in the model was due to the finding of the impact of political interest on news consumption in the literature (Entman, 2010).

Findings

A first look at the average news consumption (see Table 1) reveals that there has been a general decrease in the use of news across media systems between 2002 and 2010. However, the decrease is most significant for TV news use, but less so for the use of radio and newspaper news. It should also be noted that the Scandinavian countries show the highest interest for news of any kind, and are also the least affected by the general decrease of news use during the examined period. They have not seen a significant loss of time devoted to reading newspapers or listening to radio news between 2002 and 2010. As for the personal use of Internet (see Table 2), there has been a generalized, significant increase between 2002 and 2010 in all countries examined. Again, as a group, the Nordic countries show the highest rates of Internet use in 2002 and remain remarkably high in 2010.

Graph 1 shows the Gini indexes for the 14 European countries and 4 media systems[6] presented from lowest to highest, that is, from the most equal to the least equal distribution of time devoted to news on each medium. The graph bars are colored depending on the media system each country is in: green is for the Mediterranean countries, red for the North Atlantic, pale blue for the North-Central, and dark blue for the Scandinavian countries, which are actually a sub-group within the North Central European system. Calculations of the Gini indexes have been made from the cumulative ESS datasets (2002–2010), all five waves of which were merged together.

The Gini indexes for the discrete media systems unveil that the countries of the North Central European system are the most equalitarian in terms of newspaper news use, and particularly so for the Scandinavian countries. In this picture, Denmark would be considered an outlier, for its Gini index is larger than three of the four countries of the Central European media system (Switzerland, Germany, and the Netherlands). Immediately after Denmark, the North Atlantic

Table 1. Average news consumption by country (2002 and 2010, with 95% confidence interval) in minutes.

	2002			2010			Change	Significance
	−	Mean	+	−	Mean	+		
TV news								
Belgium	42	43	45	39	40	42	↓	
Netherlands	51	53	54	49	47	51	↓	
Switzerland	32	33	34	27	28	30	↓	*
Germany	39	40	42	35	36	37	↓	*
Denmark	53	55	57	53	55	57	=	
Norway	56	57	59	48	50	51	↓	*
Sweden	44	46	47	40	41	43	↓	*
Finland	45	46	48	44	45	47	↓	
Greece	44	46	48	39	41	42	↓	*
Spain	43	44	46	35	37	38	↓	*
Portugal	50	52	54	42	44	45	↓	*
France	46	48	50	45	46	48	↓	
Great Britain	47	49	51	39	41	42	↓	*
Ireland	51	53	56	43	45	46	↓	*
Radio news								
Belgium	27	29	31	29	31	33	↑	
Netherlands	28	30	31	24	26	28	↓	
Switzerland	24	25	27	23	24	26	↓	
Germany	28	30	31	25	26	27	↓	*
Denmark	34	36	38	29	31	34	↓	
Norway	34	36	38	32	34	36	↓	
Sweden	26	28	30	25	27	29	↓	
Finland	27	29	31	27	28	30	↓	
Greece	10	11	12	10	11	12	=	
Spain	25	28	30	20	21	23	↓	*
Portugal	21	23	25	13	14	15	↓	*
France	27	29	31	26	28	30	↓	
Great Britain	28	30	32	21	23	24	↓	*
Ireland	47	49	51	40	42	44	↓	*
Newspaper								
Belgium	12	13	14	14	15	16	↑	
Netherlands	20	21	22	19	20	21	↓	
Switzerland	20	21	22	17	18	19	↓	*
Germany	19	19	20	16	16	17	↓	*
Denmark	19	20	22	18	19	20	↓	

(continued)

Table 1. Continued

	2002			2010				
	−	Mean	+	−	Mean	+	Change	Significance
Norway	26	27	28	27	28	29	↑	
Sweden	19	20	21	20	21	22	↑	
Finland	21	22	23	23	24	25	↑	
Greece	8	9	10	8	9	10	=	
Spain	12	13	14	10	11	12	↓	
Portugal	21	23	25	9	10	11	↓	*
France	14	15	16	12	13	13	↓	*
Great Britain	16	17	18	10	11	12	↓	*
Ireland	27	29	30	21	22	23	↓	*

*means significant at a confidence level of .95.

Table 2. Personal use of Internet by country (2002 and 2010, 95% confidence interval)

	−	Mean	+	−	Mean	+	Change	Sig
Belgium	1.96	2.07	2.19	3.9	4.02	4.14	↑	*
Netherlands	2.67	2.77	2.88	4.76	4.85	4.95	↑	*
Switzerland	2.81	2.93	3.04	4.01	4.14	4.26	↑	*
Germany				3.82	3.91	4	↑	*
Denmark	3.06	3.2	3.34	4.76	4.87	4.97	↑	*
Norway	2.9	3.01	3.13	4.8	4.9	5	↑	*
Sweden	3.06	3.15	3.26	4.62	4.73	4.84	↑	*
Finland	2.4	2.5	2.6	4.04	4.16	4.27	↑	*
Greece	0.54	0.6	0.67	2.22	2.32	2.43	↑	*
Spain	1.03	1.13	1.23	3.2	3.33	3.46	↑	*
Portugal	1.09	1.2	1.32	1.98	2.09	2.21	↑	*
France				3.82	3.94	4.06	↑	*
Great Britain	2.16	2.28	2.39	4.06	4.16	4.26	↑	*
Ireland	1.74	1.85	1.95	3.93	4.03	4.13	↑	*

Source: European Social Survey, 2002–2010.
*means significant at a confidence level of .95.

countries (Great Britain and Ireland) hover between 0.62 and 0.67. The least equalitarian group is the Mediterranean countries, of which Greece's index is as high as 0.82. Interestingly, Belgium, a country belonging to the Northern-Central European media system, has a Gini index slightly higher than that of France, but
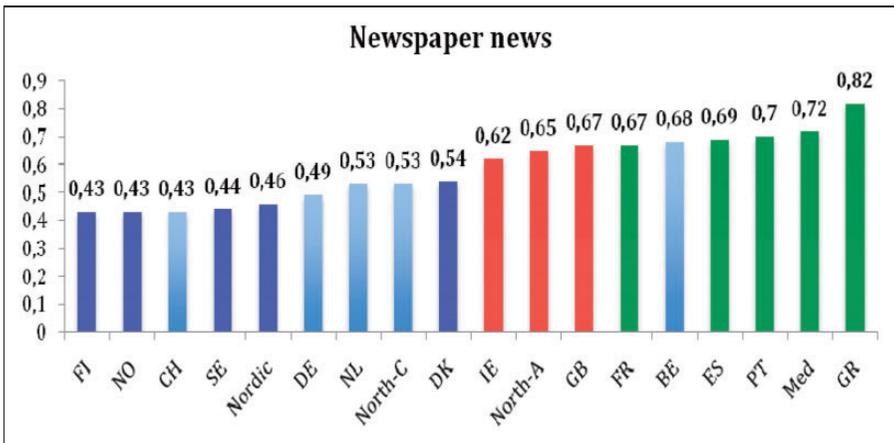
Graph 1. Gini distribution of use time, by country and media system (European Social Survey, cumulative data, 2002–2010).

lower than other Mediterranean countries. Although Belgium is considered to be in the Northern-Central European system, the country is closest to the Polarized Pluralism model while France is the Mediterranean country closest to the Democratic Corporatist model, according to Hallin and Mancini.

Therefore, despite the cases of Belgium and Denmark, our first hypothesis (H1a), namely, that the consumption of newspaper is more equally distributed in the Northern and Central European countries than in the North Atlantic countries and especially the Mediterranean countries, is generally supported by the evidence. Our H1b is also supported with the Nordic countries' newspaper use being more widely distributed than in other systems.

As for TV news use (see Graph 2), the distribution of the Gini indexes for distinct media systems is slightly different from that of newspapers. The extent of difference in TV news use among the surveyed countries is smaller, as shown in the smaller range of the Gini indexes, from Denmark's 0.35 to Greece's 0.52, compared to the newspaper range of 0.43 (Finland) to 0.82 (Greece). The Nordic countries and the countries of the Northern-Central European media system are still more egalitarian than other systems. The only two exceptions are Finland and Switzerland—the former's index is larger than the Netherlands while the latter's index is larger than some Mediterranean countries. Therefore, based on the evidence, H2a and H2b are supported. Another interesting finding from Graph 2 is the distribution of TV news is more widespread in the Mediterranean countries (Gini index of 0.45) than in the North Atlantic counterparts (Gini: 0.47).

Regarding the personal use of the Internet (see Graph 3), the overall picture derived from the Gini indexes is similar to those of the other two media. The range of the Gini indexes is similar to that of newspapers (from Denmark and Norway's 0.32 to Greece's 0.75) and larger than that of TV news use. Secondly, the use of Internet for personal reasons has already become more widespread than
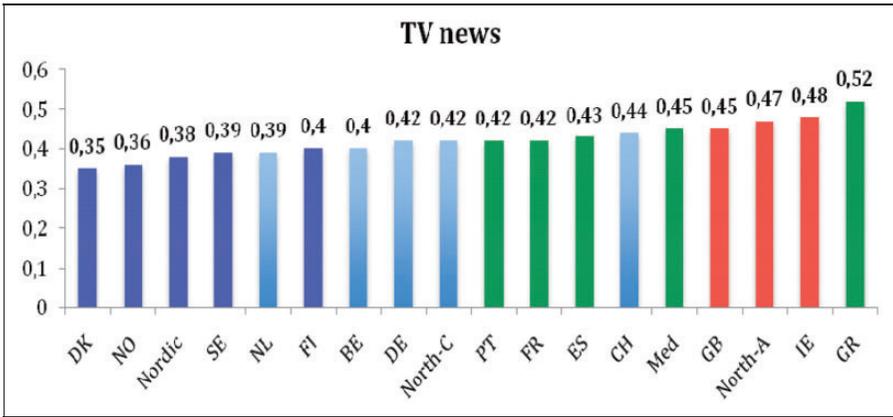
Graph 2. Gini distribution of time spent on TV news by country and media system (European Social Survey, cumulative data 2002–2010).
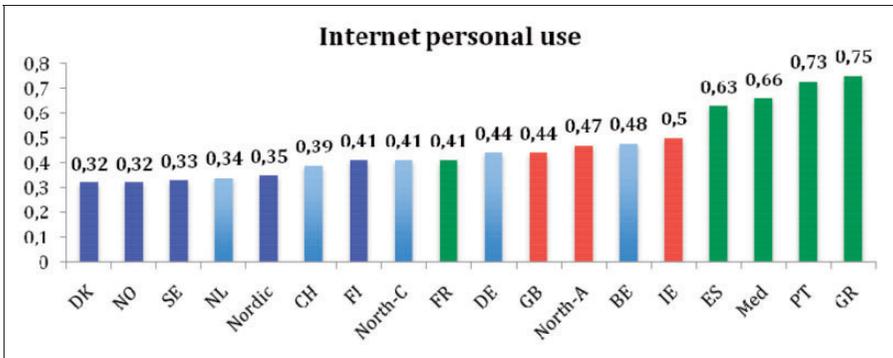
Graph 3. Gini distribution of internet personal use by country and media system (European Social Survey, cumulative data 2002–2010).

reading newspapers, as shown by the lower Gini index ranges of Internet use (Internet's 0.32–0.75, compared to newspapers' 0.43–0.82). The distribution of personal use of the Internet resembles that of newspapers—the North Central European countries, especially the Nordic ones, are most widely distributed, followed by the North Atlantic countries, and then the Mediterranean ones. Given this evidence, our third hypothesis is supported.

Table 3 shows the Pearson correlations between the countries' Gini indexes for TV and newspaper use, and the personal use of Internet, on one hand, and the countries' average media use, on the other. The results indicate that the higher the country's average use of the media, the smaller the Gini index (i.e., the more equally distributed the media use). However, the correlation coefficients are only

Table 3. Correlation between country's Gini index and media use (2002–2010, $n = 14$).

	TV	Newspapers	Internet
Correlation	−.580	−.917	−.999
Sig.	.3	.000	.000

Table 4. Predicting time spent on newspaper, TV news, and personal use of the Internet.

	Newspaper	TV	Internet
Demographics	Beta	Beta	Beta
Gender	0.078***	0.067***	0.226**
Age	0.007***	0.013***	−0.054***
Education	0.024***	−0.020***	0.205***
Political interest	−0.225***	−0.299***	−0.205***
Time spent on medium			
Newspaper news		0.228***	0.133***
TV news	0.105***		−0.088***
Radio news	0.083***	0.113***	0.031***
Internet	0.017***	−0.027***	
Media system			
North Central countries[a]	−0.013***	0.2***	0.639**
North Atlantic countries	−0.035***	0.059***	0.187**
Mediterranean countries	−0.144***	0.095***	−0.065**
Adjusted R^2	0.21	0.19	0.33
N	167,539	228,190	230,447

[a]Nordic countries are excluded.
**$p < .05$. ***$p < .01$.

significant in the cases of newspaper reading and Internet personal use (with correlation coefficients of −0.92 and −0.99, respectively) but not in the case of TV news watching (−0.58). In other words, a country's average usage of newspapers and Internet can be related to that country's distribution of newspapers and Internet; but the correlation between average TV news use and TV news distribution is not significant, a fact that may be attributed to TV's higher penetration in Europe.

Table 4 shows three regression models to predict the time spent on reading newspaper news, TV news, and the Internet. The model predicts more accurately time devoted to the personal use of the Internet (adjusted $R^2 = 0.33$) than time

spent reading newspaper news (0.21) or watching TV news (0.19). But the percentage of variance in the dependent variable predicted by the model is significant.

Other than the demographics (gender, age, and education) and political interest, the regression models show that the media system in which individuals are located is also significantly associated with usage of TV, newspapers, and the Internet. The models show that, regardless of the medium, media consumption is higher for men than women and that consumption increases with age, education and interest in politics.[7] The only exceptions to this general finding are that age is negatively associated with Internet use (i.e., the younger the respondents, the longer they spend on the Internet) and that education is positively associated with newspaper news use and Internet use, but negatively related to TV news use. Among the media use variables, time spent on watching TV news is the best predictor for time devoted to reading newspapers, and vice versa. The most powerful media use variable to affect the personal use of the Internet is time devoted to reading the newspapers. However, there is a negative association between watching TV news and time spent on the Internet, which may suggest that Internet users spend the time once reserved for TV viewing.

As for media system's impact on media use (whose coefficients were calculated without the Nordic countries, see Table 4), all three media systems were found to be negatively associated with time devoted to newspaper news, which means that being a member of a European country other than the Nordic ones is negatively associated with reading newspaper news. In addition, the beta coefficients (i.e., the strength of

Table 5. Cluster membership based on newspaper, radio, TV, and internet use variables (2002–2010).

Country	Cluster	Distance
Greece	1	0.642
Spain	1	0.557
Portugal	1	0.469
Netherlands	2	0.500
Switzerland	2	0.741
Denmark	2	0.516
Norway	2	0.459
Sweden	2	0.408
Finland	2	0.345
France	2	0.510
Belgium	3	0.325
Germany	3	0.410
Great Britain	3	0.528
Ireland	3	0.430

the association between media system and newspaper readership) are larger for North Atlantic countries, especially for Mediterranean countries, than for the North Central ones; that is, people of North Central countries are less likely to read newspapers to a less extent, compared to other systems. Furthermore, media system variables are positively associated with the amount of time devoted to TV news. As to predicting personal use of the Internet, the Mediterranean countries' media system is the only media system dummy variable that was found to be negatively associated with the time devoted to the personal use of Internet.

Our last research question asks whether media use patterns of the 14 European countries would fall into three distinct groups as Hallin and Mancini predicted. Cluster analysis was executed to analyze newspaper, television, and Internet use data derived from the sample. The results indicate that there are indeed three notably distinct groups based on media use factors between 2002 and 2010. Table 5 shows that these groups do not completely correspond to Hallin and Mancini's demarcations, but fit roughly within them. The first group is composed of three Mediterranean countries: Spain, Portugal, and Greece. The second group consists predominantly of North Central European countries that include Nordic countries; and the third group includes two North Atlantic nations (Ireland and the UK) plus Belgium and Germany. The primary deviation cases are Belgium and Germany. The case of France, which appears in the Northern-Central European group, matches Hallin and Mancini's thesis that France is the Mediterranean country closest to the Northern and Central European system.

Discussion and conclusion

The aim of this article is to use the data generated from the pan-European surveys to test empirical indicators for the taxonomy of media systems originally proposed by Hallin and Mancini. In essence, the data indicates a more widespread use of newspapers and the Internet in the Northern and Central European media systems than in the North Atlantic and Mediterranean counterparts. The Nordic nations demonstrate a higher penetration of media use than other European nations in the sample.

In order to test whether the three European media systems show a distinctive pattern of newspaper and Internet consumption we utilized five waves of European Social Survey between 2002 and 2010. Based on the self-reported data on uses of newspapers, television, and the Internet, Gini indexes were calculated for the included sample countries. The evidence shows that the three media systems proposed by Hallin and Mancini have a distinctive pattern of newspaper and Internet use. In countries within the North and Central European media system, and especially in the Scandinavian countries, there is a very widespread use of newspaper news and the Internet among members of society. In contrast, in the countries of the Mediterranean system (Spain, Portugal, Greece, and France) newspapers and Internet are distributed to comparatively smaller audiences. The European countries of the North Atlantic media system (Great Britain and Ireland) have a

newspaper and Internet consumption falling in between the North-Central and the Mediterranean countries.

Our analysis also shows that in average, the longer the time a country's users spend on a medium, the more widespread is the medium's use. This unveiled relationship can apply to newspaper consumption and the use of the Internet in Europe. Also our research results indicate an indispensable dimension of a given media system—media use pattern, both supporting and slightly revising Hallin and Mancini's thesis about European media structures. Therefore, a person from a Nordic country is expected to have a more intense consumption of newspaper news and the Internet, but spend a shorter average time watching TV news; whereas Greeks in average would spend much less time on the Internet and reading newspapers than other Europeans.

Nevertheless, our cluster analysis based on all media use factors did not fully result in the identical taxonomy Hallin and Mancini created. The outliers of extracted groups, such as Germany and Belgium, make forming nation-based taxonomy of media systems ever challenging. Perhaps, as Humphreys (2011) suggested, each country's media system is unique in its own way, and should be examined along its historical, institutional context. Other potential factors, including a country's population, economy size, and media market size (see Iosifidis, 2007; Puppis, 2009), may have also contributed to the difficulty of demarcation. The present study only focuses on one particular factor; more underlying factors of media systems should be identified, included, and examined along with the existing ones in the future.

Another potential factor that might be attributed to the tremendous challenge of media system categorization stems from the fact that there can be distinct societies coexisting within a country. Take Belgium as an example. Its dual languages (Dutch and French) and corresponding cultures could be considered as having two separate media systems. Likewise, Germany could still have the residual of the dual systems that existed for decades prior to its unification. Nevertheless, our methodology that treats each country as a unit of analysis could not incorporate this intricate element into consideration. These cases compel researchers to reconsider a more appropriate level of analysis for future endeavors.

The factor of media use has shown to contribute to distinguishing media systems in the fourteen European nations. It would be conceptually meaningful to link this particular facet of media systems to political systems as Hallin and Mancini articulated in their book. For example, one may ask whether higher news consumption among Nordic countries is positively related to their political participation and public policies that are subsequently made. If this were the case, then proactive programs and media education should be put in place to elevate public awareness and promote use of certain media.

The issue of media use is highly related to media literacy, access, and affordance, which requires a number of entities to act. Governments, lawmakers, and media industries would need to work together to shift media use patterns among the public. Media use can be pivotal to not only political knowledge and participation

but also economic opportunities and equality for the population. The impact of media use therefore can be extensive in each country and across Europe as well. This study is only the start of the series of inquiry.

There are issues about the datasets that should be raised. Beyond the particularities of the ESS media questions, indicators of media use may present problems of both validity and reliability (Chaffee and Frank, 1996; Prior, 2009a, 2009b). Answers may suffer from social desirability or merely from lack of accuracy, and are often thought to yield overestimates. Prior (2009a) has found evidence that overestimates might exceed three times on average real news consumption; moreover, the younger the respondents, the larger their overestimates are (eight times larger among respondents ages 18–34). Affluent households and households with children were also found to overestimate their news consumption. Another problem with the media use variables concerns reliability. As pointed out by Elvestad and Blekesaune (2008), nowadays any user can read newspapers, or watch/listen TV and radio news, either through traditional formats or through the Internet. In the case of the ESS, it is possible someone is giving a reading estimate for the newspaper, its companion website or both when asked about his/her newspaper readership habits, as the ESS does not define newspaper clearly. It may bring small comfort but Prior (2009a) maintains declared news consumption is stable in repeated surveys—which is the case in our study—and may be reliable.

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Notes

1. The ESS sampling expert panel did not sign off the Italian sample design in 2004. In addition, the dataset for the second wave does not contain the media use variables, thus it was not included for this research. Also, we lack media use data from Austria for the last two waves of the survey (2008 and 2010).
2. The countries are Belgium, Netherlands, Germany, Switzerland, Denmark, Norway, Sweden, and Finland, from the North Central European or Democratic Corporatist model; United Kingdom and Ireland, from the North Atlantic or liberal model; and Spain, Portugal, Greece and France, from the Polarized Pluralist or Mediterranean model. There is no data for Greece in the third wave (2006). Also, for particular variables, the ESS does not have data for some of the waves, such as data for personal use of Internet in France and Germany for the first and second waves (2002 and 2004).
3. Namely, 'No time at all', 'Less than 1/2 hour', '1/2 hour to 1 hour', 'More than 1 hour, up to 1 1/2 hours', 'More than 1 1/2 hours, up to 2 hours', 'More than 2 hours, up to 2 1/2 hours', 'More than 2 1/2 hours, up to 3 hours', 'More than 3 hours', and 'Don't know'.

4. The answer categories are: 'No access at home or work (0)', 'Never use (0)', 'Less than once a month (1)', 'Once a month' (2), 'Several times a month (3)', 'Once a week (4)', 'Several times a week (5)', and 'Every day (6)'. The numbers into brackets show how the categories have been recoded (the values 'no access at home or work' and 'never use' have been merged into 0).
5. For a step by step guide to calculate the Gini index using an Excel file, see Thompson (1997).
6. The labels for the media systems are Nordic (Scandinavian countries: FI, Finland; No, Norway; SE, Sweden; and DK, Denmark), North-C (Northern and Central European system: CH, Switzerland; DE, Germany; NL, Netherlands; BE, Belgium), North-A (North Atlantic system: GB, Great Britain; IE, Ireland), and Med (Mediterranean system: FR, France; ES, Spain; PT, Portugal; GR, Greece).
7. Values for the interest in politics variable range from 1 ('very interested') to 4 ('not at all interested'), hence the negative beta coefficients for this variable.

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