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Political Knowledge Gaps Among News Consumers with Different News Media Repertoires Across Multiple Platforms

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This survey research (*N* = 2,098) identified news media repertoires based on users' overall news consumption patterns and then investigated how political knowledge acquisition differs across distinct repertoire groups. A cluster analysis produced three repertoire groups: news avoiders (72.7%), emerging news seekers (9.6%) who prefer newer media (i.e., Internet, mobile, and SNSs), and traditional news seekers (17.7%) who heavily rely on older media. Moreover, traditional news seekers outperformed emerging seekers as well as avoiders in the acquisition of political knowledge, and the high education group possessed more political knowledge than the low education group. Finally, the magnitude of the knowledge gap between the high and low education groups was statistically significant for both the news avoiders and traditional seekers, but not for the emerging seekers.

Keywords: news media repertoires, cross-platforms, knowledge gap, political knowledge, cluster analysis

The fact that the average amount of political knowledge possessed by citizens remains relatively static, despite the rapid proliferation of political information sources over the past several decades, might conceal an important aspect of such a tendency: a widening gap or polarization of information acquisition across segments of the population with different social structural backgrounds (Prior, 2005). This seemingly contradictory observation is exactly what the knowledge gap research tradition is concerned about. Knowledge, particularly of politics and public affairs, arguably empowers those who possess it (Childers & Post, 1975; Delli Carpini & Keeter, 1994; Donohue, Olien, & Tichenor, 1987; Olien, Donohue, & Tichenor, 1983). An unequal distribution of socially empowering knowledge runs against the democratic ideal of informed citizenship as a precondition of the proper exercise of civic duties and rights (Delli Carpini & Keeter, 1996; Verba, Schlozman, & Brady, 1995). Since the formation of the "knowledge gap

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hypothesis" (Tichenor, Donohue, & Olien, 1970), numerous studies have consistently shown that political information disseminated through media primarily reaches those who are already privileged and, thus, least in need of it (see Gaziano, 1983, 1997; Hwang & Jeong, 2009; Viswanath & Finnegan, 1996 for reviews).

For more than 40 years, knowledge gap research has expanded the boundaries of its application in terms of knowledge domain, data collection method, measurement, regional setting, media type, etc. In this study, we focus on the type of media adopted and used by news consumers. Indeed, news media type has enjoyed considerable research attention from a number of scholars (e.g., Eveland & Scheufele, 2000; Kim, 2008; McLeod, Bybee, & Durall, 1979; Newman, Just, & Crigler, 1992, Yang & Grabe, 2010, 2011), including the original research team (Donohue et al., 1987; Donohue, Tichenor, & Olien, 1973). These scholars have predominantly compared the relative size of the education-based knowledge gap across several media. Past research, however, tested the knowledge gap using medium-by-medium comparisons (e.g., print versus TV versus Internet). This might not have been a critical shortcoming until the 1990s, when news was exclusively provided by a limited number of outlets and most people heavily relied on either newspapers or broadcast media as their primary news source. Currently, it is a very widespread trend to use multiple media across diverse platforms; accordingly, with medium-specific approaches, it is virtually impossible to identify users' overall news consumption patterns (Ksiazek, Malthouse, & Webster, 2010). Hence, in this study we will employ the concept of media repertoires that can encompass different cross-media use among individuals or groups.

The origin of media repertoires is rooted in the term "channel repertoire," which refers to "the set of channels watched regularly by an individual or household" (Heeter, 1985, p. 133). The concept of channel repertoire emerged with the increasing number of channels (as well as subscribers) on cable television. According to Heeter (1985), audiences—who typically have a finite amount of time and attention—tend to choose subsets of the channels available to them and to use these repeatedly, rather than allocate their time and attention equally or randomly to all available channels. A number of subsequent studies have tested and confirmed what Heeter predicted, applying the concept of channel repertoire (e.g., Ferguson, 1992; Ferguson & Melkote, 1997; Ferguson & Perse, 1993; Lochte & Warrant, 1989; Neuendorf, Atkin, & Jeffres, 2001; Yuan & Webster, 2006). Although the majority of the research on repertoires up to the present time has concentrated on television, some researchers have expanded the application of the concept to other single media use, such as the World Wide Web (e.g., Ferguson & Perse, 2000), or to cross-media use.

It is noteworthy that most previous studies employing cross-media approaches have tried to identify distinct media repertoires from audiences' overall media use (e.g., Hasebrink & Popp, 2006; Reagan, 1996; Taneja, Webster, Malthouse, & Ksiazek, 2012; van Rees & van Eijck, 2003); a few exceptional studies have limited their interest to specific media content, such as health information (O'Keefe, Boyd, & Brown, 1998) or news (Ksiazek et al., 2010; Yuan, 2011). In the study reported here, we will focus on audiences' cross-platform *news* consumption patterns rather than attempt to encompass their overall multiple media use. That is primarily because the current study aims at investigating how political knowledge acquisition differs across groups of people with distinct media repertoires.

Revisiting the Knowledge Gap Hypothesis

The knowledge gap theory can be succinctly summarized in this famous hypothesis: "As the infusion of mass media information into a social system increases, segments of the population with higher socio-economic status tend to acquire this information at a faster rate than the lower status segments, so that the gap in knowledge between these segments tends to increase rather than decrease" (Tichenor et al., 1970, pp. 159–160). As such, the knowledge gap theory was originally devised to examine widening information gaps across different classes at the macro social level. Later, however, some scholars reduced the scope of its analysis, insisting that individual differences (e.g., motivation or issue interest) are better predictors of knowledge gaps than social structural factors (e.g., Ettema & Kline, 1977; Genova & Greenberg, 1979; Kwak, 1999). In the present study, we try to follow the critical intent of the original research team; we regard the unequal distribution of information as a social problem, not a difference based on individual traits.

Since the knowledge gap theory was formulated in 1970, a number of studies, employing either survey or experimental methods, have robustly shown that groups with a level of higher education or socioeconomic status (SES) perform better in their acquisition of public affairs knowledge from media than their counterparts with lower levels of education or SES (see Gaziano, 1983, 1997; Hwang & Jeong, 2009; Viswanath & Finnegan, 1996 for reviews).[2] This is not surprising, considering that more educated people typically have efficient information processing skills (Cho & McLeod, 2007; Eveland & Scheufele, 2000; Gaziano, 1983), well organized schemas and prior knowledge (Price & Zaller, 1993; Tichenor et al., 1970), and a profound interest in public affairs. Therefore, in testing the knowledge gap hypothesis, it is essential to include the third intervening variable through which the education-based gap widens or narrows (Eveland & Scheufele, 2000; Gaziano, 1983). Roughly, three distinctive methods for examining the hypothesis have been identified, depending on the type of moderator between education and knowledge gain.

First, a panel study design devised by the original research team (Tichenor et al., 1970) examines education-based knowledge acquisition over time. The difference in knowledge about a certain issue between the two education groups is expected to increase as the coverage of news media accumulates. In addition to the longitudinal method, Tichenor and his colleagues alternatively suggested a cross-sectional manner through which differential knowledge gained by education groups might be tested

[2] Although Tichenor and his colleagues (1970) included SES as the main independent variable in the original knowledge gap hypothesis, many subsequent studies have employed education instead of SES when empirically testing knowledge gaps. As a multifaceted concept, SES consists of several subdimensions: education, income, and occupation. Education, however, has served as the representative indicator of SES in numerous past research (e.g., Eveland & Schefele, 2000; Grabe, Kamhawi, & Yegiyan, 2009; Jerit, Barabas, & Bolsen, 2006; Kim, 2008; Yang & Grabe, 2011), primarily because it is easier to quantify and creates fewer "no" responses than other SES subconcepts. Furthermore, strong correlations have been found between education and other SES variables (see Gaziano's 1997 study for reviews). In this study, we also use education as the main independent variable, following the tradition of prior empirical research.

across topics for more media publicity and less media publicity. The less salient topic is assumed to be at the time one point in a longitudinal method; a more salient topic at the time two point. Third, Eveland and Scheufele (2000) proposed that the amount of media use could be another moderator in the relationship between education and knowledge level. From this model, it is hypothesized that an education-based knowledge gap is greater among heavy media users than light media users at a given point in time. The third alternative method, in addition to the two earlier ones, has been employed by a number of researchers for testing the knowledge gap hypothesis (e.g., Eveland & Scheufele, 2000; Grabe, Yegiyan, & Kamhawi, 2008; Kim, 2008; Kwak, 1999, McLeod et al., 1979).

Knowledge gap phenomena have also been tested using several other variables aside from time, media publicity, and media use. The knowledge domain or type of issue is a typical example of moderators affecting the magnitude of education-based knowledge gaps. Knowledge, as defined by the original proponents of the theory, was limited to information about public affairs and science (Tichenor et al., 1970). Later, researchers expanded the boundaries of knowledge to include health, technology, and entertainment news (e.g., Chew & Palmer, 1994; Jeffres, Neuendorf, & Atkin, 2012; Valente & Saba, 2001; Yang & Grabe, 2010). Comprehensive reviews (Gaziano, 1983, 1997) and a recent meta-analysis (Hwang & Jeong, 2009) confirm that non-public-affairs topics produce smaller knowledge gaps than public and social issues. Additionally, the meta-analysis shows that the level of issue coverage moderates the size of knowledge gaps: the largest disparity appears among international issues, followed by national, personal, and local issues, in that order.

Media type, which has received considerable research attention since the early studies (e.g., Donohue et al., 1973; 1987; McLeod et al., 1979; Newman et al., 1992), has also been included as the third intervening variable in recent knowledge gap research (e.g., Eveland & Scheufele, 2000; Kim, 2008; Yang & Grabe, 2010, 2011). To roughly sum up the findings, television news might contribute to narrowing the knowledge gap across education groups, newspapers are probably responsible for a widening gap, and the Internet tends to exacerbate the existing divide. Similar to this line of research, this study will examine how media type used moderates the size of the difference in knowledge gain between the two education groups. This study is, however, distinguished from prior research by the attention it pays to overall news media usage patterns across different platforms, rather than medium-specific usage. In past research, which typically used survey methods, the amount of media use was measured by media type (e.g., TV news, newspapers, and online news) from the same sample of respondents. In doing so, a hypothetical respondent, for instance, might have been repeatedly categorized as a light television news viewer, a heavy newspaper reader, and an online news nonuser.

In other words, media usage was examined not in terms of media user but rather of media type, in the previous studies. From the findings of this design, it might be concluded that certain medium usage produces a larger education-based knowledge gap than other media types; but this is not to conclude that those who heavily depend on certain kinds of news media show a wider gap in knowledge acquisition across education levels than those who mainly use other types of news media. To overcome this limitation of prior research, we will employ the concept of media repertoires in knowledge gap research. Before moving on to news media repertoires, the basic hypothesis of the knowledge gap research will be tested first, as the starting point for this study.

H1: The high education group will have more political knowledge than the low education group.

News Media Repertoires and Political Knowledge Acquisition

Developments in the media environment during the past several decades have dramatically changed our ways of consuming news. The growing number of cable television channels, the expanding accessibility to the Internet, and the advent of smart devices have given rise to the proliferation of media, channels, and platforms for entertainment as well as news content, which in turn has facilitated selective exposure among users (Ksiazek et al., 2010). Under these circumstances, news continuously competes with other content for users' limited time and attention (Prior, 2005; Sunstein, 2007). A number of scholars predicted that virtually unlimited amount of information and extremely diverse content would increase audience polarization, particularly when it comes to news content (Curtain, Dougall, & Mersey, 2007; Knobloch-Westerwick, Sharma, Hansen, & Alter, 2005; Patterson, 2000; Prior, 2005, 2007; Sunstein, 2007; van den Bulck, 2006). There might be clear divide between people who have a strong preference for news or information and people who do not. In other words, those who closely pursue news content would be persistently exposed to news across various sources; on the other hand, those who favor non-news content would continuously turn away from news in their media use. Prior (2007) named these two groups news junkies and switchers, respectively. In a similar vein, Ksiazek and his colleagues (2010) made an operational as well as a conceptual distinction between news seekers and avoiders. Such a dichotomous approach, however, might conceal existing differences among news seekers, whose total amount of news consumption may be similar but whose media repertoires diverge in the composition of the cross-platforms they access.

Currently, it is common to use multiple media for news consumption across platforms. In the mass media era, most people could be categorized as either print or broadcast news users, depending on the medium they most heavily relied on. Such a simple classification based on the most used medium seems to be not only difficult but also outdated in the new media era. It is no exaggeration that single media users are less typical than cross-platform users, and empirical studies have shown supporting evidence for this (Ahlers, 2006; Didi & LaRose, 2006; Ksiazek et al., 2010; Tewksbury, 2003; Yuan, 2011). In this study, we will adopt news media repertoires embedded in multiple media use as the key concept and draw several clusters of media users in terms of their overall news consumption patterns. News media repertoires can be defined as subsets of the news media platforms that individual users select among comprehensive available choices (Taneja et al., 2012), which include network television, cable television, radio, newspapers, computer-based online news, mobile-based news access, social networking sites (SNSs), etc. If there are two persons who use three different media for their news consumption, they could fall into different repertoire groups based on the media they prefer: for example, broadcast, newspaper, and PC-based Internet versus PC-based Internet, mobile, and SNSs.

As discussed earlier, past empirical research on media repertoires has predominantly examined audiences' overall media use. Among a small number of studies that have focused on news media (e.g., Ksiazek et al., 2010; Yuan, 2011), few have tested the effects of news media repertoires on political engagement, including knowledge acquisition. Similar to the current study, Ksiazek and his colleagues (2010) examined how users' overall news consumption patterns affect civic engagement—specifically

political participation. In that study, however, the respondents were classified into either the news seeker or avoider group, depending on their score on a "total news consumption index" derived from news media use across six platforms.

In this context, the present study primarily aims at investigating how political knowledge acquisition diverges across citizens with different news media repertoires and whether the size of an education-based gap in the acquisition of political knowledge differs across distinct repertoire groups. Before investigating differences among news consumers with divergent repertoires, it is necessary to identify what repertoire groups are derived from users' overall news consumption across platforms. Thus, the following research question was formulated:

RQ1: What types of repertoire groups are drawn from users' cross-platform news media use?

Then, the main effect of repertoire group type on political knowledge acquisition will be tested. Last, we will examine widening or narrowing education-based knowledge gaps across users with different cross-platform news media repertoires.

RQ2: What is the relationship between repertoire group and their political knowledge acquisition?

RQ3: Does an education-based political knowledge gap widen or narrow across news consumers with different media repertoires?

Method

Data Collection

The data for this study were collected through an online survey from a national sample of Korean Broadcasting System (KBS) panelists. The KBS online panelists consist of approximately 140,000 respondents who are highly representative of the entire population of South Korea. The online survey for this study was conducted over three days (June 12–15, 2012), using a nationwide sample of 2,111 respondents above the age of 15. Based on the population census data of Statistics Korea (2010), the sample was selected according to the quota of gender, age, and region. Excluding 13 people whose responses for news media variables were partly missing, the data from the remaining 2,098 were analyzed for testing the hypotheses and research questions.

Measures and Variable Construction

News media repertoires:* K-*means cluster analysis. To identify users' news media repertoires, two distinctive approaches have been employed in past empirical research. First, as a deductive method, respondents were asked to choose one best-fit repertoire among several choices devised by the researchers in advance (e.g., Reagan, 1996). Alternatively, using inductive methods, media repertoires were derived from the respondents' overall media consumption patterns by asking them to record their media use at certain intervals (e.g., van Rees & van Eijck, 2003), observing their media use behaviors during some period of time (e.g., Taneja et al., 2012), or allowing them to indicate their average

time for using each medium (typically per day) across seemingly all possible media or platforms (e.g., Ksiazeck et al., 2010; Yuan, 2011). We will follow the latter approach, which has been more widely adopted in past research.

In this study, news media repertoires were operationally defined as respondents' subset combinations of daily news media use across available platforms, including network TV, pay TV (cable, satellite, and IPTV), radio, newspapers, computer-based Internet access, mobile-based news access (either Internet or news applications), and SNSs.[3] According to the goal of this study, media repertoires can be analyzed in terms of either media usage or media users. The former typically formulates various media repertoire types across all respondents from factor analysis (e.g., Taneja et al., 2012; Yuan, 2011); on the other hand, the latter generally categorizes media users based on their overall media consumption patterns from cluster analysis (e.g., Kang, Lee, Lee, 2008; Lee, Lee, & Sung, 2009; van Rees & van Eijck, 2000; Yun & Moon, 2010). We need to identify news media repertoires by user rather than by usage because the current study aims at testing different levels of political knowledge acquisition across news media users with distinct media repertoires.

In line with preceding empirical studies that employed *k*-means cluster analysis based on a relative media usage index (Kang et al., 2008; Lee et al., 2009; Yun & Moon, 2010), this study also attempted to classify user groups depending on their repertoire type using cluster analysis. The relative media usage index represents each respondent's media use time divided by the entire sample mean per media type. By constructing the index in this way, the same amount of time for media use can reflect different meanings across media (Kang et al., 2008). For example, if respondents' daily average time for TV and newspaper use is 100 minutes, a hypothetical respondent who uses TV for 80 minutes and newspapers for 20 minutes and another one who uses TV for 20 minutes and newspapers for 80 minutes should be treated differently, despite the fact that their total amount of media use time does not differ. Cluster analysis based on raw media use time might result in lower levels of discrimination among identified clusters, compared to using a relative media usage index, because television is expected to emerge as the most important medium in almost all clusters.

The *k*-means cluster analysis for classifying news media repertoires was conducted through the following three steps: (1) deduction of appropriate *k* value range; (2) reproducibility assessment; and (3) final cluster classification. As a starting point, it is necessary to identify the range of *k* values (i.e., number of clusters) in order to conduct a *k*-means cluster analysis. Hence, the overall data structure was examined using a hierarchical cluster analysis and Multi-Dimensional Scaling (MDS). Because both analyses are very difficult to apply to large-scale data, 10% out of the 2,098 cases were randomly extracted and then submitted to a hierarchical cluster analysis and MDS. As a result, the appropriate range of the *k* value was determined to be from 3 to 11.

[3] Besides these seven news media types, news magazines can also be included as an additional news media platform. News magazines were not employed in this study because recent survey data in Korea (Korea Broadcast Advertising Corporation, 2012; Korea Press Foundation, 2009) confirmed that few Koreans use magazines for news consumption and respondents' average use time was only 1.7 minutes on a daily basis.

Next, the optimal *k* value was derived from the reproducibility assessment of bipartite data, following the procedures proposed by Heo and Lee (2008). As shown in Table 1, the best reproducibility of 0.89 was found in cases of *K* = 3 and *K* = 4 in the RAND index. In the corrected RAND index, however, *K* = 3 (0.79) was slightly ahead of *K* = 4 (0.78). Thus, *K* = 3 with the highest stability was confirmed as the final number of clusters.

Table 1. Evaluation of Clustering Reproducibility (K = 3 to 11).

	Rand Index	Corrected Rand Index
K = 3	0.89	0.79
K = 4	0.89	0.78
K = 5	0.78	0.55
K = 6	0.86	0.71
K = 7	0.83	0.63
K = 8	0.80	0.56
K = 9	0.78	0.50
K = 10	0.82	0.58
K = 11	0.82	0.55

Last, news media repertoire groups were identified from a *k*-means cluster analysis with a *k* value = 3 for the entire sample data. As presented in Table 2, Cluster 1 constituted the largest percentage (72.7%), followed by Cluster 3 (17.7%), and Cluster 2 (9.6%), in that order. In this study, these three identified groups correspond to three different types of news media repertoires.

Table 2. Number of Cases by Cluster.

Cluster	N	%
1	1526	72.7
2	201	9.6
3	371	17.7
Total	2098	100

Education. Following the tradition of knowledge gap research (e.g., Eveland & Scheufele, 2000; Grabe, Lang, Zhou, & Bolls, 2000; Jerit et al., 2006; Kim, 2008; Tichenor et al., 1970; Yang & Grabe, 2011), education was divided into high and low levels. The high education group (57.2%) was composed of respondents who had some college education—those having completed either a B.A. or B.S. degree or who had attended a college or university at the time of data collection. On the other hand, those included in the low education group had no more than a high school diploma (42.8%).

Dependent variable: Political knowledge acquisition. Although traditional knowledge gap research has typically examined the level of knowledge acquisition of a single issue, recent empirical studies have tended to use an index of several topical issues (e.g., Eveland & Scheufele, 2000; Jeffres et al., 2012; Jerit et al., 2006; Kim, 2008; Yang & Grabe, 2010, 2011). In line with this recent trend, we also formulated a composite measure of knowledge acquisition.

Political knowledge has been conceptually divided into roughly two categories in past research (e.g., Delli Carpini & Keeter, 1994; Garramone & Atkin, 1986; Zaller, 1992). The first category consists of civic or structural knowledge that is closely related to information about political systems, institutions, or processes. The other category concerns current events or issue specific knowledge regarding the dynamic political activities occurring in the current society. According to Delli Carpini and Keeter (1996), knowledge across different political domains is highly correlated since citizens are typically generalists rather than specialists with regards to their political knowledge. Considering that the present study is mainly concerned with political knowledge acquisition from news media use, we composed our political knowledge questions using ANES-type current affairs knowledge items, which have repeatedly been shown to be reliable measures of political knowledge (see Brians & Watterberg, 1996; Delli Carpini & Keeter, 1996; Eveland & Scheufele, 2000; Luskin, 1987). Specifically, a total of eight questions were employed in order to test political knowledge acquisition: for example, "Which political party gained the 3rd largest number of seats in the 19th National Assembly?"; "What is the name of the party leader elected at the recent convention of the Democratic Party?" The correct answers to the eight questions were added up to compose the final political knowledge score. The respondents' mean for political knowledge was 4.53 (*SD* = 2.69).

Results

Findings for News Media Repertoires (RQ1)

For the purpose of a final confirmation of the repertoire types identified above, three groups derived from *k*-means cluster analysis were compared in terms of Relative Usage Index (RUI) as well as raw usage time across the seven news media platforms (see Table 3). If the RUI of any given cluster is above 1.0 for a specific medium, it indicates that the use of that particular medium falls above the average of all respondents. On the other hand, a usage index that is smaller than 1.0 indicates that it is below the average.

Table 3. Relative Usage Index and Raw Usage Time Across Platforms, by Cluster.

		Cluster 1 (n = 1526)	Cluster 2 (n = 201)	Cluster 3 (n = 371)	F (2, 2095)
		M (SD)	M (SD)	M (SD)	
Network TV	RUI	0.75 (0.51)	0.99 (0.69)	2.04 (1.10)	558.03***
	Raw	53.73 (36.55)	71.05 (49.71)	146.49 (78.65)	
Pay TV	RUI	0.59 (0.80)	1.26 (1.51)	2.53 (2.34)	345.23***
	Raw	16.47 (22.39)	35.10 (42.11)	70.55 (65.04)	
Radio	RUI	0.49 (0.81)	1.08 (1.55)	3.05 (3.32)	370.19***
	Raw	10.72 (17.72)	23.61 (33.90)	66.82 (72.59)	
Newspapers	RUI	0.62 (0.88)	1.19 (1.50)	2.45 (2.37)	282.02***
	Raw	12.17 (17.38)	23.34 (29.50)	47.99 (46.46)	
Internet	RUI	0.70 (0.67)	2.01 (1.27)	1.69 (1.53)	287.70***
	Raw	34.85 (33.75)	100.17 (63.69)	84.19 (76.17)	
Mobile	RUI	0.62 (0.83)	4.10 (2.64)	0.82 (1.14)	771.74***
	Raw	13.91 (18.43)	91.16 (58.72)	18.27 (25.43)	
SNSs	RUI	0.43 (0.90)	5.38 (4.33)	0.95 (1.48)	781.51***
	Raw	5.94 (12.30)	73.01 (58.76)	12.89 (20.10)	

*** $p < .001$

As Table 3 shows, those in Cluster 1 turned out to use news media less than the total mean across all seven platforms. The highest RUI for Cluster 1 was .75 for network TV, followed by the Internet (.70), newspapers and mobile (.62), pay TV (.59), radio (.49), and SNSs (.43), in that order. In Cluster 2, the amount of traditional news media use—such as pay TV (1.26), newspapers (1.19), radio (1.08), and network TV (.99)—was slightly higher or lower than the average, while emerging media use—including SNSs (5.38), mobile (4.10), and the Internet (2.10)—ranged from two to five times the total mean. Last, Cluster 3 shows high RUI scores for older media—radio (3.05), pay TV (2.53), newspapers (2.45), and network TV (2.04)—a moderate score for the Internet (1.69), and low scores for brand-new platforms (SNSs = .95, mobile = .82). Figure 1 is a graphic presentation of the differences in the index for relative news media use across the three identified clusters. Based on the observations above, the three clusters can be called as news avoiders, emerging news seekers, and traditional news seekers, respectively.

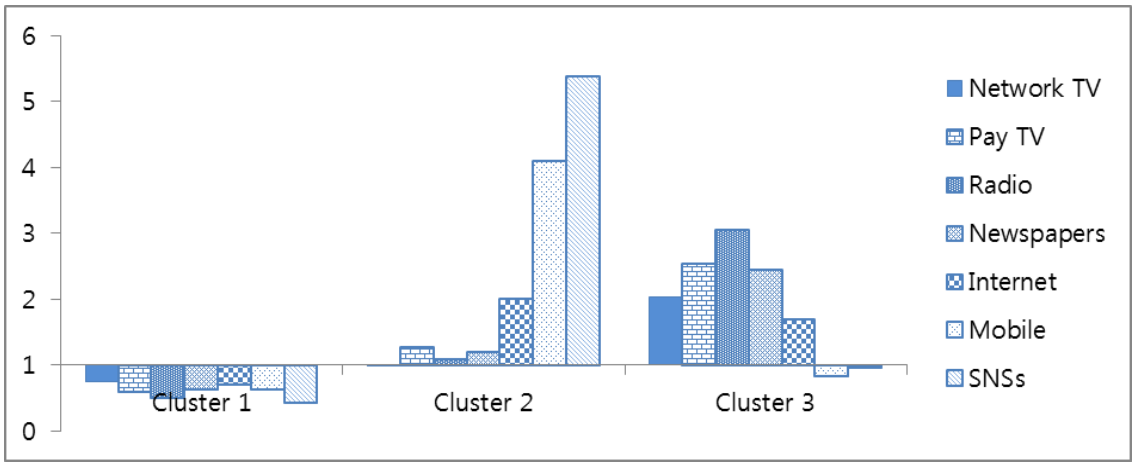

Figure 1. Relative usage index across news media platforms by repertoire group.

The demographic features of the three news media repertoire groups were as follows. First, distribution of income was not drastically different across the three repertoire groups. Likewise, the ratio of high education (at least some college) and low education (less than a high school diploma) groups, which is a critical division of this study, ranged roughly from 5:5 to 6:4 across the three groups—the total means were 57% for the former and 43% for the later. The news-avoider group shares demographic properties with the total sample because they composed 72.7% of the all respondents. The emerging news seekers were relatively younger than the other group members. Over 55% of emerging seekers were in their 20s and 30s (compared to 45.7% for avoiders and 20% for traditional seekers). By contrast, the traditional seeker group consisted of more older and male users, compared to the other two groups. Each subgroup of those who were over 50 years old and male respondents made up approximately 58% of the traditional seekers, respectively.

Findings for Knowledge Gaps (H1, RQ 2, & RQ 3)

To test the main and interaction effects of education and news media repertoires on political knowledge acquisition, an Education (2) x Repertoire (3) ANOVA was conducted for knowledge acquisition (see Table 4).

The main effect for education on political knowledge was significant, as was predicted in Hypothesis 1. The high education group (M = 4.86, SD = 2.57) outperformed the low education group (M = 4.14, SD = 2.77) in acquiring political knowledge, $F(1, 2092) = 14.12$, $p < .001$. As shown in Table 4, news media repertoires also had a significant main effect on political knowledge acquisition, $F(2, 2092) = 11.28$, $p < .001$. Specifically, there were statistical differences in political knowledge acquisition across traditional news seekers (M = 5.11, SD = 2.55), avoiders (M = 4.44, SD = 2.69), and emerging seekers (M = 4.37, SD = 2.71). A post hoc analysis (Tukey's test) revealed that traditional seekers had significantly more political knowledge than either avoiders (mean difference = .67, $p < .001$) or emerging seekers (mean difference = .73, $p < .01$).

Table 4. ANOVA (ANCOVA) for Political Knowledge Acquisition Before and After Controlling for Age and Gender.

Source	Before controlling		After controlling	
	F	*p*	*F*	*p*
Age	–	–	100.88***	.00
Gender	–	–	73.73***	.00
Education (E)	14.12***	.00	25.62***	.00
Repertoire (R)	11.28***	.00	.87	.41
E × R	.89	.41	.40	.67
Error	(7.02)[a]		(6.48)[a]	

a. Value in parentheses represents mean square error.
*** $p < .001$

The interaction between news media repertoires and education did not have a significant effect on political knowledge acquisition, $F(2, 2092) = .89$, p = n.s. Post hoc analyses were conducted to determine if there are education-based differences within repertoire groups (see Table 5 and Figure 2). The results showed that, first, more educated news avoiders ($M = 4.78$, $SD = 2.59$) acquired higher levels of political knowledge than their less educated counterparts ($M = 3.98$, $SD = 2.76$), $t(1524) = 5.83$, $p < .001$. In the same manner, traditional news seekers also showed significant differences across the high ($M = 5.49$, $SD = 2.35$) and the low ($M = 4.70$, $SD = 2.69$) education groups, $t(369) = 2.99$, $p < 0.01$. On the other hand, there was no difference in political knowledge acquisition between the two education groups ($M = 4.47, 4.21$, $SD = 2.62, 2.87$) among emerging news seekers, $t(199)=.66$, p = n.s.

Based on our findings that respondents' age and gender were considerably different across the three repertoire groups, an Education (2) x Repertoire (3) ANCOVA was additionally performed, with age and gender as the covariates (see Table 4). First, the main effect for education remained significant—or, more precisely, became stronger—on knowledge acquisition, $F(1, 2088) = 25.62$, $p < .001$, thus confirming the high education group's better performance ($M = 4.94$, $SE = .10$) than that of the low education group ($M = 4.13$, $SE = .12$). In contrast, the main effect for news media repertoires fell below the statistically significant level, after controlling for age and gender, $F(2, 2088) = .89$, p = n.s. Specifically, there was no difference in political knowledge acquisition across news avoiders ($M = 4.45$, $SE = .06$), emerging seekers ($M = 4.49$, $SE = .18$), and traditional seekers ($M = 4.65$, $SE = .13$).

Table 5. Observed and Estimated Means of Political Knowledge by Education and News Media Repertoire Group.

Group	Education		Mean difference
	Low	High	
News avoiders			
Observed	3.98 (2.76)	4.78 (2.59)	0.80***
Estimated	4.00[a] (0.10)	4.90[a] (0.09)	0.90***
Emerging seekers			
Observed	4.21 (2.87)	4.47 (2.62)	0.26
Estimated	4.21[a] (0.32)	4.78[a] (0.25)	0.57
Traditional seekers			
Observed	4.70 (2.69)	5.49 (2.35)	0.79**
Estimated	4.18[a] (0.19)	5.14[a] (0.18)	0.96***

Note. Values in parentheses represent SD/SE.

a. Covariates appearing in the model were evaluated as follows: Age = 3.58 (mid-30s); Gender = 1.48 (male = 1, female = 2).

** $p < .01$, *** $p < .001$

Although the interaction effect between news media repertoires and education was not significant, post hoc analyses confirmed that education-based knowledge gaps remained the same across the three repertoire groups, after controlling for respondents' age and gender (see Table 5). As for both news avoiders and traditional seekers, the political knowledge of the more highly educated people (M = 4.90, 5.14, SE = .09, .18) was significantly greater than that of the less educated (M = 4.00, 4.18, SE = .10, .19), $F(1, 1522) = 46.14$, $p < .001$, and $F(1, 365) = 14.226$, $p < .001$. On the other hand, emerging news seekers did not differ in their acquisition of political knowledge across the high (M = 4.78, SE = .25) and the low (M = 4.21, SE = .32) education groups, $F(1, 197) = .80$, p = n.s.

Discussion

The primary purpose of this study was to identify specific news media repertoires based on users' overall news consumption patterns, and then to investigate how political knowledge acquisition differs across news media users with distinct repertoires who choose different subsets of cross-media platforms. The study reported here is distinguished from past knowledge-gap research by paying attention to overall cross-platform news media use in order to overcome the limitations of medium-specific approaches and employing the concept of media repertories that can encompass different cross-media use.

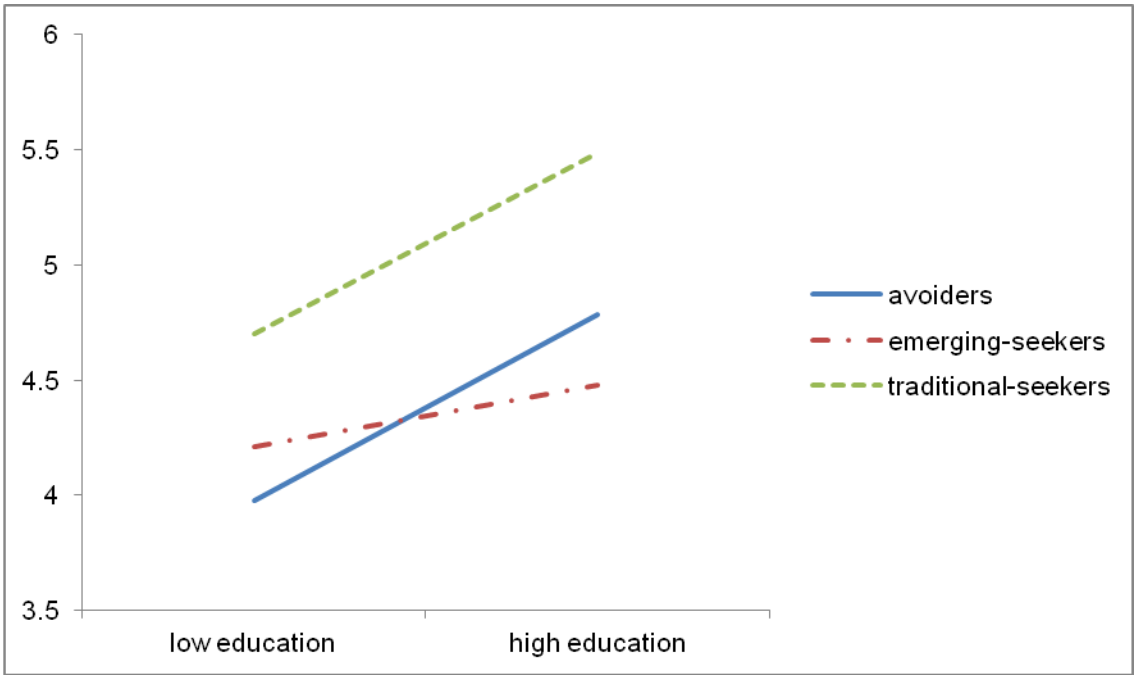

Figure 2. Political knowledge acquisition by education and news media repertoire group.

A cluster analysis from a national sample of 2,098 KBS panelists in South Korea produced three news media repertoire groups: news avoiders, emerging news seekers, and traditional news seekers. Almost three-fourths of respondents (72.7%) fell into the news avoider group—that is, those who seldom consume news regardless of the type of media or platform. This result is consistent with the findings of previous studies (e.g., Ksiazeck et al., 2010; Prior, 2007); a considerable proportion of media users constantly turn their faces away from news under high-choice conditions. Unlike past research, this study attempted to classify news seekers (Ksiazeck et al., 2010) or news junkies (Prior, 2007) into subcategories, based on the composition of their media choices across platforms. As emerging news seekers, approximately 10% of respondents turned out to use mainly newer media such as the Internet, mobile, and SNSs for news consumption. This group was slightly younger than the other groups. On the other hand, traditional news seekers (17.7%), who heavily consume news from older media including network television, pay television, newspapers, and radio, tended to be older and male. In terms of education—one of the main independent variables in this study—and income, the three repertoire groups did not prominently diverge.

Participants' political knowledge differed significantly depending on the repertoire group they were engaged in. Traditional news seekers outperformed emerging seekers as well as avoiders. The statistical differences, however, disappeared after inserting age and gender as covariates, perhaps because the traditional seekers were older and consisted of slightly more males. It is notable, however,

that this study's concern is knowledge acquisition differences across news consumers with distinct news media repertoires, rather than the repertoire effect itself on knowledge gain. Hence, it can be concluded that news media users who heavily rely on traditional sources tend to acquire more political knowledge than those who either consistently avoid news or consume news exclusively from emerging media. This is in line with the findings of past research that performed medium-by-medium comparisons, typically print versus online news (e.g., Tewksbury & Althaus, 2000; Yang & Grabe, 2011), confirming that news consumers might benefit more from traditional than emerging media, at least in acquiring socially important information.

As a number of knowledge gap studies have consistently shown for the past 40 years (see Hwang & Jeong, 2009 for reviews), the high education group of this study possessed more political knowledge than the low education group, and the main effect of education was robust, considering that its statistical significance even increased after controlling for age and gender.

Finally, the magnitude of the knowledge gap between the high and low education groups was statistically significant for both the news avoider and traditional seeker groups, but not for the emerging seekers; these differences remained significant after controlling for age and gender. In other words, the high education group's better performances in acquiring political knowledge robustly appeared, regardless of the amount of news media use, with the exception of those who consume news mainly from emerging media such as the Internet, mobile, and SNSs. This result, however, should not be interpreted to mean that emerging media might have the potential of closing the knowledge gap due to several reasons. First, such new media, particularly mobile and SNSs are "emerging" per se, which means that simply the novelty of using new media might be a significant factor. Likewise, the emerging news seekers of this study made up only 10% of the respondents. Perhaps the majority of them are early adopters or innovators who typically have features that are different from the rest of the population (see Rogers, 1983). Last, recent empirical studies conducted in South Korea that compared knowledge gaps across newspapers and Internet-based online news—which is still emerging yet already somewhat established—found that the latter tend to exacerbate the education-based gap (e.g., Yang & Grabe, 2011), or at least to produce gaps close to those that newspapers create (e.g., Kim, 2008). Coupled with the finding of no statistical difference between news avoiders and emerging seekers in the acquisition of political knowledge, it seems highly possible that those who were named emerging seekers are still in a transition period, compared to the avoiders or traditional seekers. Therefore, subsequent research needs to closely follow how this group changes in terms of their news consumption and knowledge acquisition as emerging news media diffuse into the society.

To sum up the findings of the study reported here, there might be a sharp divide in terms of news consumption under extremely high-choice conditions, such as the one the current media environment provides. Many people purposely avoid news, while others enjoy a varied diet of news sources and content. Simultaneously, a persistent and structural gap also exists in terms of acquiring socially important information from media across people with high and low educational backgrounds. It is noteworthy that those who consume news in similar patterns—i.e., who have the same media repertoires—differed in political knowledge acquisition according to their level of education, except for a small proportion of emerging news seekers. Such a polarization or divide in two different dimensions

might lead to overall audience fragmentation, which seems to intensify as the number of emerging information sources increases. Although it might be premature to draw a conclusion based on findings from emerging news seekers, those can provide a sketchy idea of future news users. The fact that emerging news seekers did not differ in political knowledge acquisition with news avoiders implies that recently emerging media such as mobile and SNSs might not contribute significantly to enhancing their users' information acquisition. This tentative observation needs to be either supported or modified by future follow-up empirical studies.

It is noteworthy that the findings of this study are difficult to generalize to other societies, considering that South Korea is one of the most wired and networked countries in the world and is also relatively homogeneous in terms of its ethnicity, language, and education level. Thus, one can expect that some results would be different if the same study were to be conducted in other countries that have different media consumption markers. This homogeneity, however, may serve as an advantage rather than a shortcoming of the current study. It seems very likely that the knowledge or information gaps found in a highly homogeneous and wired society might be even wider in more diverse societies such as those of United States and some European countries. In this sense, South Korea might serve as one of the most conservative settings to test such knowledge gaps. In addition to cultural settings, the knowledge domain or type of issue needs to be expanded to other areas than just politics, such as social welfare, technology, and entertainment, either individually or across studies in the future, considering that the magnitude of such knowledge gaps can increase or decrease depending on the knowledge domain (see Hwang & Jeong, 2009). Last, in subsequent studies, it is highly recommended to measure knowledge beyond simple factual information. For instance, the measure of comprehension devised by Robinson and Levy (1986) might be a useful alternative, in that it examines whether respondents understand the main points of news stories rather than just remember the discrete information embedded in them.

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