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The internet's impact on international knowledge

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Abstract

With data from a national telephone survey, the current study examines the comparative and synergistic influence of the internet on international knowledge. Independent and interactive media effects are considered in terms of four medium-specific measures of international news attention. Internet news attention had the most positive effect on international knowledge of any of the news measures. In terms of the other three news attention measures, the effects of newspapers and cable TV were positive, while that of network TV was non-significant. In addition, the interaction of internet news attention and network TV news attention positively predicted international knowledge. In contrast, the interaction of newspaper news attention and network TV news attention negatively predicted international knowledge. These findings indicate the positive comparative and synergistic influence that the internet can have on international knowledge development in the United States.

Key words

international knowledge • international news • internet news
• internet news effects

INTRODUCTION

McLuhan (1962) contended that the evolution of the mass media would render a 'global village' in which people could experience events from afar as though they were actually there. In *Understanding Media*, McLuhan (1964)

wrote: 'Today, after more than a century of electric technology, we have extended our central nervous system in a global embrace, abolishing both space and time as far as our planet is concerned' (1964: p. 3). In this global village, time and space are no more, with electronic networks allowing for simultaneous communication and interaction from afar (McLuhan and Fiore, 1967). In such a networked world, unimpeded information flows are critical, with the political, economic, social and cultural systems of different countries more closely tied than ever (Castells, 2000).

That the evolution of the mass media, when considered in tandem with the decline in the importance of time and space, would create a global village in which people of different countries can more closely monitor and interact with one another seems to bode well for the process by which Americans would develop knowledge about foreign countries and their people. Research, however, offers little support for this outcome. Although international knowledge is associated with the important processes by which Americans vote in national elections (Aldrich et al., 1989; Pomper, 1975) and develop values, concepts and skills related to global interdependence (Haas, 1989), American levels of international knowledge remain embarrassingly low (Sanders and Stewart, 2003). For example, Americans between the ages of 18 and 24 finished last in a test of global geographic literacy, behind young adults in Canada, France, Germany, Great Britain, Italy, Japan, Mexico and Sweden (National Geographic-Roper, 2002). Only 21 percent and 17 percent of Americans could pinpoint Israel and Afghanistan, respectively. Perhaps more startling is that 29 percent of the Americans could not find the Pacific Ocean and 11 percent could not locate the United States.

Although McLuhan's death in 1980 predated the age of the internet, this new medium appears to be a quintessential form of McLuhan's 'electronic technology', one that would abolish time and space and foster globalization. In fact, this 'inherently international medium' has been viewed as a significant contributor to the globalization of the economy and culture, one that is unimpeded by national borders (Halavais, 2000). The internet, the newest and most advanced form of 'electronic technology', has not, however, been shown to be a consistent means to knowledge development. Surveys conducted from the 1990s until the millennium offered little support for the positive influence of internet news use on knowledge development (e.g. Johnson et al., 1999). In their study of the 2000 election campaign, Weaver and Drew (2001) found that the internet, in terms of measures of news exposure and campaign information attention, was not a significant predictor of campaign issue knowledge. In addition, experimental research at the time indicated that print media played a more positive role in knowledge development than the internet (Eveland and Dunwoody, 2001; Sundar et al., 1998). In one experiment, Tewksbury and Althaus (2000) demonstrated that readers of the

online *New York Times* had lower levels of event recognition and recall than readers of the traditional version of the newspaper.

The studies mentioned above were conducted during the 'early years' of the internet, when the medium was in its nascent stage of development and expansion, and when usage and experience rates were low. Since then, internet use has increased dramatically, as has its role in knowledge development. In terms of the American public, internet use has risen consistently: 5.3 percent in 1995, 21 percent in 1996, 34.5 percent in 1999 and 54 percent in 2000 (Pew, 2000; Stempel et al., 2000). Similarly, weekly online news access for Americans increased from 20 percent in 1998 to 33 percent in 2000 (Pew, 2000), with news reading becoming the second most popular online activity after email (Pew, 2003). In addition, the increased impact of the internet on knowledge development has been indicated by recent experimental studies. Although the internet's impact was negligible just a few years ago, it now appears that internet news use is strongly associated with knowledge development (Eveland et al., 2004; Tewksbury et al., 2001). For example, Eveland et al. (2002) demonstrated that users of the online *New York Times* had higher levels of structured free recall than users of the traditional version of the newspaper.

Despite these recent findings, there are three gaps to this line of research. First, although recent experimental studies have indicated the positive role that internet news use can play in knowledge development, more survey research is required to explore this relationship. Unlike experiments, surveys can allow for generalization of research findings to a target population. Second, although some research has demonstrated that newspaper and TV news use positively predicts international knowledge (Beaudoin, 2004; Erskine, 1962; Snyder, 1993; Star and Hughes, 1950), only one study could be located that comments on the impact of the internet on international knowledge (National Geographic-Roper, 2002). That study, however, is limited by its topical focus on geography alone, its internet variable involving general access and not news use, and its analysis approach failing to consider the impact of non-internet media and other important variables such as international interest and demographics. Third, although previous research has tested the influence of use of internet news independent of use of other news media, it has not considered the internet's potential synergistic, or interactive, effects. Such effects are important because, as demonstrated in the areas of marketing (Thorson and Moore, 1996) and journalism (Bucy, 2003), exposure to multiple media can bring about greatly different effects than exposure to just one medium.

The current study attempts to address these three gaps in the literature. With data from a national telephone survey, the current study considers the impact of internet news on international knowledge as compared to other types of news. In addition, it examines the synergistic effects of multiple media on international knowledge.

NEWS MEDIA INFLUENCE ON INTERNATIONAL KNOWLEDGE

The effects that different mass media have on knowledge vary as a result of innate media differences (Graber, 1993; Neuman et al., 1992). For this reason, a consideration of the effects of the mass media on international knowledge should focus on the attributes that are shared, to differing degrees, by the media. Eveland (2003) articulates six such attributes that are useful in understanding why effects differ by medium: interactivity, organization, control, channel, textuality and content. The first four of these attributes appear to be most important in explaining the manner in which the mass media may influence international knowledge. Interactivity has been defined as 'the extent to which communication reflects back on itself, feeds on and responds to the past' (Newhagen and Rafaeli, 1996: 6). Organization can be considered in terms of 'the extent to which content is organized linearly or nonlinearly' (Eveland, 2003: 399). Control entails the ease with which and, more generally, the manner in which a user navigates through a website. It can include the order of presentation and the amount of content. Finally, channel involves the senses that a person uses to receive a message. To date, such senses commonly include visual and audio message reception.

Print newspapers

As Eveland (2003) points out, traditional newspapers are low in interactivity. The choices and desires of readers at the time of news consumption do not influence the news content that can be accessed. In addition, newspapers appear in a linear format, with each story reading from left to right, top to bottom, often in an inverted pyramid style. Control in terms of newspaper reading is relatively high, with users being able to manage the pace, sequence and content of information consumed. Finally, in terms of channel, newspapers are highly visual, relying on text, tables, graphs and still photos, and without any audio or audiovisual components. Other scholars have commented on the pros and cons of newspapers as a means to knowledge acquisition (Graber, 1993; Neuman et al., 1992). Newspapers can provide information in a detailed, organized manner that is conducive to learning. In addition, print is well suited for conveying abstract ideas and facts. As a result of these attributes, learning from newspapers is an active process (Robinson and Levy, 1996).

A small body of research has considered the role of newspaper readership in the development of international knowledge. This research suggests that newspaper readership is positively associated with international knowledge (e.g. Erskine, 1962). Specifically, newspaper readership has been associated with knowledge related to the Gulf War (Snyder, 1993) and the United Nations (Star and Hughes, 1950). In a more recent study, Beaudoin (2004) demonstrated a positive association between international knowledge and international news attention, which was measured in terms of newspapers, cable TV and network TV.

Television news

Eveland (2003) explains that television news is low in interactivity. As with newspapers, TV news content is not related to the choices and desires of news users. It is static, remaining in one form throughout the consumption process. While television newscasts are highly linear, having a normal flow from serious stories to weather and sports at the end, segments within a newscast can have a more narrative, less linear format. User control of TV news is low, as the pace, sequencing and content are controlled by the TV station. Finally, television offers a strong channel mix, relying upon audio, visual, audiovisual, text, tables, graphs and still photos. Other scholars have commented on the attributes of television news and the relationships of such to the effects of the medium (Graber, 1993; Neuman et al., 1992). Television news offers exciting visuals and realism and can grab the user's attention. In addition, because of its visual nature, TV is well-suited to portray realism and emotional appeal. TV has drawbacks, as well. TV news does poorly when it comes to transmitting meaning. Such broadcasts are fragmented and appear to make news seem trivial. Nevertheless, because Americans are in general not interested in, or knowledgeable of, foreign affairs, they can be easily influenced by TV news coverage of such subjects (Graber, 1984). As a result of television's different attributes from newspapers, learning from television news is a more passive process (Zukin and Snyder, 1984).

Very little research has considered the impact of TV news use on international knowledge. This research suggests that TV news use is positively associated with international knowledge (e.g. Erskine, 1962). As noted earlier, Beaudoin (2004) demonstrated that an international news attention index, involving newspaper and TV news media, was a significant predictor of international knowledge.

Internet news

Online news sites, such as those considered in the current study, have moderate levels of interactivity (Eveland, 2003). Although not often having chat options, they do, importantly, provide opportunities for users to opine in various forms, including web logs, surveys and polls. In addition, search engines and almost endless networks and layers of information position online news sites as an ideal tool for active learning. With little text on the main page of an online newspaper, news users need to click on links to access information in the form of text, image, audio and video.

The organization or structure of online news sites is relatively similar to that of traditional newspapers (Eveland, 2003). The stories in both media appear in linear format, often with an inverted pyramid style. That said, hyperlinks and audiovisual news stories offer a shift away from the linear format. When it comes to control, levels are high in terms of online news sites. Users can move along at their own pace and order, choosing to focus on different news topics and

different aspects of such topics. In terms of the search for international information, this attribute is especially important. It allows users to seek out information specific to a country, region or event of interest. In terms of channel, online news sites greatly empower the user. Users can read traditional print stories, listen to radio-like news reports, and watch television-like news segments – with each of these communication modes operating at the same time (Dutta-Bergman, 2004a). Thus, in terms of multimediability, the internet provides information in the forms of print, image, audio and video. User ability to rely on each of these formats has increased, as the internet and related technologies have developed. Because people learn in different ways, a multimedial learning environment with high user control, such as the internet, can allow people to choose a means of learning that is consistent with their own learning strengths (Kinzie et al. 1988; Young, 1996). While in the past such a choice may have involved television vs. print, it now appears that the internet, with its advanced offering of print, image, audio and video, can provide users with multiple means to learning. Specifically, the internet's high interactivity and the related high levels of user control would be expected to spur increases in motivation for learning (Kinzie, 1990; Steinberg, 1989), with this motivation predictive of knowledge gain (Neuman, 1976).

Only one study, however, could be located that comments on the relationship between the internet and any type of international knowledge. As noted earlier, that study demonstrated that Americans who had accessed the internet within the previous 30 days had 65 percent higher levels of global geographic knowledge than Americans who had not (National Geographic-Roper, 2002). As also mentioned above, the application of this study is limited.

Despite the lack of research focusing on the role of the internet in the development of international knowledge, a general basis for understanding the relationship can be found in research that considers the impact of internet news on other indexes of knowledge. Such research began during the 1990s, which was the first decade of online journalism. Experiments and surveys conducted from this time until 2000 offered little support for the positive role that the internet could play in knowledge development. For example, Sundar et al. (1998) conducted an experiment to compare recall of print and online versions of a newspaper article and related ads, indicating that print users had better ad recall than online users. In another study, Johnson et al. (1999) examined the influence of the internet in the context of the 1996 presidential election. Internet use and internet attention were not significantly associated with knowledge about Clinton or Dole, nor the issue stands of either candidate. Similarly, Tewksbury and Althaus (2000) demonstrated that online readers of the *New York Times* had lower levels of event recognition and recall than did readers of the traditional version of the newspaper. In yet another study, Weaver and Drew (2001) found that internet news exposure and internet

campaign information attention were not significant predictors of campaign issue knowledge. Finally, in an experiment that compared learning from print vs. learning from the web, Eveland and Dunwoody (2001) demonstrated that recognition of a magazine article about the flu virus was higher for print than for the web.

The relationship between internet news use and knowledge development, however, appears to have changed with time (e.g. Tewksbury et al., 2001). Recent experimental research suggests a different pattern of internet news effects than those of studies conducted from the 1990s until 2000. The more recent findings indicate that the internet is beginning to play an important role in knowledge development, as the internet and related technologies have developed and use and experience levels with the new medium have risen. For example, Eveland et al. (2002) found that users of the online *New York Times* had more structured free recall than users of the traditional *New York Times*. In another study, Eveland et al. (2004) demonstrated that the linking nature of web news content encouraged the development of densely interconnected knowledge structures for common web users, but not for rare web users.

There are two potential rationales for why the findings from the 1990s until 2000 differ from those of more recent studies. First, the change in findings could result from changes in the aforementioned media attributes articulated by Eveland (2003). It could be that as the internet's interactivity, control, organizational and channel capacities have developed, the effects of the medium have increased. Second, the change in findings could result from changes in the characteristics of the message recipient (Dutta-Bergman, 2004a), which can take form in a person's use and experience levels with a specific medium. Previous research has indicated that people can become overwhelmed by incoming information if their experience level is low (Tuovinen and Sweller, 1999). Thus, it makes sense that as people gain experience with a medium, the influence of the medium will increase. This, indeed, appears to be the case in terms of the internet (Eveland et al., 2004). As noted above, internet use and experience levels have expanded dramatically in recent years (Pew, 2000, 2003; Stempel et al., 2000). Considering media effects to be a function of receiver characteristics suggests the importance of an active, non-homogenous audience.

Previous research has indicated that use of news media other than the internet plays a positive role in the development of international knowledge. These findings, in tandem with recent experimental findings involving the role of the internet in knowledge development, as well as increases in internet use and experience, suggest that internet news attention will be positively associated with international knowledge. This leads to the articulation of the following hypothesis:

H1: Internet news attention will positively predict international knowledge.

SYNERGISTIC EFFECTS OF MULTIPLE MEDIA

The use and effects of multiple media have been considered in several ways. Displacement theorists have considered media use and media effects to be a zero-sum game (Kayany and Yelsma, 2000). Thus, increased use of one medium brings about a reduction in the use of another medium, with the introduction and growth of a new medium displacing existing media. In this framework, people are considered to have a limited amount of time. If they devote more time to a new activity, they must devote less time to an old one. This zero-sum relationship between media is also consistent with the notion that inter-media competition takes place when there is an overlap in the resources used by different media types (Dutta-Bergman, 2004b).

Media use and media effects have been viewed via this zero-sum lens. In terms of media use, Pew (2000) demonstrated increases in internet news use, but decreases in network TV news viewing, local TV news viewing and daily newspaper readership. The decline in network TV news use was explained in terms of the increase in internet news use. Thus, in considering news use as a zero-sum game, Pew rationalized that the rise in internet news use resulted from a decline in another type of news use. In other words, an advance in one news technology could come about only at the expense of another. In terms of media effects, a similar zero-sum approach has also been taken by previous research. For example, knowledge levels of the users of one medium have been compared to those of the users of another medium, posing users of one medium versus users of another medium and, in the process, overlooking the possibility of complementary influences. Such research has demonstrated that newspaper readers traditionally have higher levels of knowledge than TV news viewers (Chaffee et al., 1970; Neuman et al., 1992).

This zero-sum approach to understanding media use and media effects appears to be flawed. To begin with, the zero-sum approach does not take into account the reality that people seek out information via, and are influenced by, multiple media. Because news selection and attention are active processes (Zillman and Bryant, 1985), individuals who are interested in a specific issue or event are likely to access multiple media as part of the information-seeking process (Carey, 2002; Dutta-Bergman, 2004b). For example, 45 percent of internet news users get their news both online and offline (Pew, 2004). In fact, the internet is the only news source for 17 percent of internet news users, while 71 percent of this group get their news more frequently from offline news media such as newspapers, TV and radio. In arguing against the zero-sum approach, two recent studies have demonstrated the complementarity of news consumption across media types. In one study, Dutta-Bergman (2004a) demonstrated congruence between patterns of use of different media types within specific content areas. Specifically, users of a certain type of news content online were more likely to consume the same

type of content via another medium than nonusers of the online news. In another study, Dutta-Bergman (2004b) examined the complimentary use of telephones and the internet as means of interpersonal communication following the attacks in the US on 11 September 2001. The author found support for channel complementarity, demonstrating that people who communicated via telephone about the attacks were also more likely to communicate via the internet about them. These studies suggest that media use should not be considered in an isolated or independent sense but, instead, in one that is complimentary.

The zero-sum approach fares no better when considering its application to media effects. Within a zero-sum framework, people's responses to the mass media would have a limit or cap. Thus, the effect of one medium on a person could be no less than the total effect of two media on the same person. The concept of media synergy goes against this zero-sum approach. The concept holds that media effects from two media will be greater than the sum of the effects of the two individual media. Synergy represents the combination of processes and parts that result in the creation of something that exceeds their sum. Thorson and Moore (1996) applied the concept to message effects in the realm of integrated marketing communication, which recommends the coordination of different types of messages for maximum impact. The authors defined media synergy as 'the linkages that are created in a receiver's mind as a result of messages that connect to create impact beyond the power of any one message on its own' (1996: 333). They suggested that the impact of a media message can go beyond its individual form. Thus, a synergistic effect can be derived from the deliverance of a message via a diversity of media and, more specifically, from the structure, links and repetition of the message and its relationship to other similar messages via multi-channel processing. In a recent experimental study, Bucy (2003) demonstrated support for the synergistic effects that on-air and online network news exposure has on the development of perceptions of network news credibility. This study suggests, as Travers (1970) explained, that cues in multiple messages can elicit different cognitive effects that can interact with one another, with this process allowing one message to spur recognition, while another message may augment the chance of recall.

Against this backdrop, the current study considers news media attention in a multiplicative sense, with attention to more than one medium expected to influence information selection, storage and retrieval (Thorson and Moore, 1996) and, as a result, the comprehensive media effect. Synergistic effects can be tested via the interaction of the two media variables. A similar approach has been applied to testing the interaction of media use and education in knowledge gap research and the similar interactions of media use and both involvement and interpersonal communication in predicting knowledge and perceptions (e.g., Beaudoin, 2004; Kwak, 1999; Scheufele, 2002). In the current article, media

synergy is evaluated in terms of interactions between the following four media: internet news, newspaper news, cable TV news and network TV news. The use of multiple media is expected to influence the development of knowledge. This synergistic effect could take various forms, including a means of information repetition, of double-checking information or filling gaps in shallow or inaccurate information, and of gathering initial recognition of an event or issue from one medium and then collecting more in-depth and contextual information from another medium. In addition, a synergistic effect could be explained in terms of Eveland's (2003) 'mix of attributes' approach, with the differing attributes of two media blending together to alter media effects. This literature leads to the following synergy-related hypothesis:

H2: The interactions of medium-specific news attention measures will predict international knowledge.

Method

In order to examine the influence on international knowledge of internet news as compared to that of other media, as well as the news media's synergistic influence on international knowledge, a national telephone survey was conducted from 1 June 2001 to 16 July 2001. A research centre at a large US university completed telephone survey interviews with 467 adults. Sampling stratification of the United States and the individual households in it was achieved with the implementation of stratified random-digit dialling and the Trolldahl-Carter-Bryant method of respondent selection (Lavrakas, 1993). The response (RR2) and cooperation (COOP2) rates were 52 percent and 70 percent, respectively (American Association for Public Opinion Research [AAPOR], 2004).

Measurement

Control demographics were age, ethnicity ($W = 1$), household income, education and gender ($M = 1$). Household income was measured on a seven-point interval scale from 'less than \$25,000' to '\$150,000 or more' ($M = 2.88$, $SD = 1.49$). Education was measured on a ratio-scale of years from 'no formal education' (0) to 'graduate degree or more' (19) ($M = 14.70$, $SD = 2.86$). The mean age was 44.33 years ($SD = 15.70$). In addition, 57 percent of the sample was male and 79 percent was White. The income and age levels are similar to those of the US population, but the current sample is slightly more male, educated and White (US Census Bureau, 2000).

There are also measures of international interest, attention to international news and international knowledge. The statements for each of these indexes appear in the Appendix. Because of the important role that interest plays in predicting knowledge (Weaver and Drew, 2001), international interest was inserted

as a control variable. International interest was measured with four items, involving the geography, economic conditions, histories and political happenings of other nations in the world ($\alpha = .86$). Responses were measured on a nine-point scale from 'strongly disagree' (1) to 'strongly agree' (9). The mean was 6.90 ($SD = 1.72$).

The mass media variables involved attention (Chaffee and Schleuder, 1986) and were specific to international news content (McLeod and McDonald, 1985). Responses for attention measures were from 'no attention at all' (0) to 'very close attention' (8). The descriptive statistics were as follows: newspaper news attention, $M = 3.54$, $SD = 2.77$; network TV news attention, $M = 4.38$, $SD = 2.75$; cable TV news attention, $M = 3.51$, $SD = 3.17$; and internet news attention, $M = 2.22$, $SD = 2.84$.

International knowledge was measured with close-ended questions (Beaudoin, 2004; Peffley and Hurwitz, 1992; Robinson, 1967), eight specific to China and eight specific to Great Britain. These two countries were selected because of their prominence in international news coverage at the time of, and immediately preceding, the telephone survey. A 16-item additive index was created to represent international knowledge (K-R $20 = .82$) ($M = 10.76$, $SD = 3.57$).

Finally, two-way interaction terms were constructed. There were six interaction terms, one for each pairing of the news attention measures for newspaper, cable TV, network TV and internet. Independent variables were standardized before computation of interaction product terms (Kwak, 1999). These product terms and the standardized forms of the independent variables were used to decrease multicollinearity between the product terms and their independent variable components, while not altering the relationship of the independent variable components (Dunlap and Kemery, 1987).

Statistical procedure

Hierarchical regression analysis was conducted with reference to the previous approaches of Weaver and Drew (2001) and Kwak (1999). There were five steps. Demographics and international interest were entered in the first and second steps, respectively. The third step consisted of the news attention measures for newspaper, network TV news and cable TV news. Internet news attention was entered in the fourth step. The fifth step consisted of the six news media interaction terms. The tests of these six interactions involve the relationship of attention to news in one medium and international knowledge as moderated by attention to news in another. A moderator influences the impact of a predictor variable on a criterion variable (Holmbeck, 1997). The implementation of demographics, international interest and the three news attention measures prior to internet news attention provides a very conservative test of the effect of the internet news attention measure (Weaver and Drew, 2001).

• Table 1 Predictors of international knowledge

VARIABLE	B	SE B	β
Step 1			
Education	1.26	.17	.35***
Gender (M = 1)	1.38	.32	.20***
Ethnicity (W = 1)	1.09	.38	.13**
Income	.11	.11	.05
Age	.03	.01	.15***
Step 2			
International interest	.78	.15	.22***
Step 3			
NP (Newspaper news attention)	.44	.17	.12**
NTV (Network news attention)	.08	.16	.02
CTV (Cable TV news attention)	.45	.16	.13**
Step 4			
INT (Internet news attention)	.74	.15	.21***
Step 5			
INT X NP	-.13	.14	-.04
INT X NTV	.27	.15	.08*
INT X CTV	-.16	.14	-.05
NP X CTV	.23	.15	.07
NP X NTV	-.29	.15	-.09*
CTV X NTV	-.04	.16	-.01

* $p < .05$; ** $p < .01$; *** $p < .001$

Note: $R^2 = .23$ for Step 1; $\Delta R^2 = .05$ for Step 2; $\Delta R^2 = .03$ for Step 3; $\Delta R^2 = .04$ for Step 4; $\Delta R^2 = .02$ for Step 5 ($ps < .05$).

Results

The hierarchical regression analysis accounted for a relatively good amount of variance in international knowledge ($R^2 = .37$). As depicted in Step 1 of Table 1, international knowledge was positively predicted by gender ($\beta = .20$), ethnicity ($\beta = .13$), age ($\beta = .15$), and education ($\beta = .35$). Men were more knowledgeable than women, and Whites were more knowledgeable than non-Whites. In addition, the older and more educated people were, the higher their levels of international knowledge. Step 2 of Table 1 indicates a positive correlation between international interest and international knowledge ($\beta = .22$). Thus, people who have higher levels of interest have higher levels of knowledge than people with lower levels of interest. Step 3 of Table 1 depicts the influence of the international news attention measures specific to newspapers, network TV and cable TV. There are significant associations between international knowledge and both newspaper news attention ($\beta = .12$) and cable TV news attention ($\beta = .13$).

Tests of hypotheses

Hypothesis 1 posited that internet news attention would positively predict international knowledge. As depicted in Step 4 of Table 1, after controlling for demographics, international interest, and three news attention measures, internet news attention significantly predicted international knowledge ($\beta = .21$). That this standardized coefficient was positive offers strong support for Hypothesis 1.

Hypothesis 2 held that the interactions of news attention measures would predict international knowledge. Step 5 of Table 1 depicts two such significant interactions – that of newspaper news attention and network TV news attention ($\beta = -.09$), and that of internet news attention and network TV news attention ($\beta = .08$). These two significant interactions offer support for Hypothesis 2. It should be noted that the signs of the standardized coefficients of these two significant interaction terms are different, one being positive and one being negative.

Discussion

The current study examined the comparative and synergistic effects of news attention on international knowledge. Internet news attention, which was specific to international news coverage, positively predicted international knowledge after controlling for demographics, international interest and other news attention measures. In fact, its standardized coefficient ($\beta = .21$) was the largest of any media measure and the third largest of any of the measures, behind only education and international interest. These findings indicate the important role that the internet can play in informing and educating Americans about foreign countries and their people. These findings are important because of the historically low levels of American knowledge about other parts of the world (National Geographic-Roper, 2002; Sanders and Stewart, 2003) and the increasingly close ties between Americans and people from other countries (Castells, 2000). In addition, these findings suggest that the internet, with its strong mix of attributes (Eveland, 2003), is properly suited for the process by which news consumers actively seek out information (Robinson and Levy, 1996). Internet news users enjoy high degrees of interactivity and control, while also benefiting from the medium's organizational and multi-channel nature (Eveland, 2003). News users can rely on differing media forms of information from the internet, as a result of its converging of print, image, audio and video media. They can search for relevant information and can, via hyperlinks, seek out additional stories to add depth and context to an original story. They can complete polls and surveys and insert their specific ideas and opinions in various forms including web logs. They can advance through the information seeking process at their own pace and via their own preferred order.

It is important to consider this finding in terms of previous research. Surveys and experiments conducted from the 1990s until 2000 found little

support for the influence of internet news use on knowledge (e.g. Eveland and Dunwoody, 2001; Johnson et al., 1999; Sundar et al., 1998; Tewksbury and Althaus, 2000; Weaver and Drew, 2001). Although more recent experimental research indicated that the internet plays a positive role in the development of knowledge (Eveland et al., 2002, 2004; Tewksbury et al., 2001), previous survey research has not considered the impact of the internet on international knowledge. The current findings help fill this gap in the literature. The findings suggest that, in the current era of increased internet use and experience, this new medium plays a strong role in the development of knowledge, one more positive than that of newspapers, network TV and cable TV.

Albeit smaller in size than those of the internet, the effects of cable TV and newspapers were also positive. That the influence of newspapers was more positive than that of network TV news supports a long line of research involving knowledge development (Chaffee et al., 1970; Neuman et al., 1992). The positive role of cable TV news attention supports Graber (1984), who contended that people could be easily influenced by TV news coverage of foreign affairs because of their low levels of interest in, and knowledge of, related issues and events.

The current study also explored the potential synergistic effects of the mass media. Such effects have been demonstrated in the area of marketing (Thorson and Moore, 1996) and journalism (Bucy, 2003). In such cases, use of multiple media brought about greatly different effects than use of just one medium. Similarly, other research has considered the interactive roles of media use and interpersonal discussion (Beaudoin, 2004; Kwak, 1999; Scheufele, 2002), concluding that use of two forms of communication can bring about differentially greater effects than use of one form of communication. The current findings support such synergistic effects in terms of the development of international knowledge.

Surprisingly, however, the signs of the two significant interactions were mixed. The interaction between internet news attention and network TV news attention indicates a positive synergistic effect for people who pay attention to international news via the internet *and* network TV. It could be the case that the TV medium draws people's attention, while the internet allows for access to more in-depth and contextual information. It could also be that people use these two media to double check facts and clarify confusing or difficult reports. This significant interaction suggests that news use via the internet and network TV offers a fertile mix of attributes (Eveland, 2003). As noted above, the internet offers good levels of control and interactivity, as well as organization and multi-channel capacities. In contrast, television news is low in interactivity and user control, has very strong audio and visual attributes, and has a linear format for newscasts, but a less linear one within news stories. This mix of the attributes of the internet and network TV news thus provides linear and nonlinear formatting and high

levels of control, interactivity and multi-channel aspects. It should be noted that, with the addition of the positive interaction effect of network TV news attention, each of the four news attention measures has a positive independent or synergistic role in predicting international knowledge. This supports Graber (1993), who contended that each medium plays a role in the development of knowledge.

In contrast, the effect on international knowledge of the interaction of newspaper news attention and network TV news attention was negative. This indicates that people who use these two media incur what could be viewed as being a negative synergy. This suggests a less productive mix of the attributes of these two media (Eveland, 2003). As noted above, television news is low in interactivity, has a highly linear format, is low in user control, and very strong when it comes to audio and visual attributes. Traditional print newspapers can be characterized as being low in interactivity, linear in format, relatively high in terms of user control and highly visual, but without any audio or audiovisual components. This mix of the attributes of newspaper and network TV news thus offers a blend of control and format levels, but low levels of interactivity and multi-channel aspects. It appears that this mix of attributes is less conducive to learning than the mix provided by the internet and network TV.

The main limitation of the current study involves causation. Although the study posits a direction of influence from news attention to knowledge, cross-sectional survey data cannot conclusively determine this direction of influence. That said, experimental studies (e.g. Eveland et al., 2002, 2004; Tewksbury et al., 2001) have demonstrated the causal influence of internet news use on knowledge.

The current study finds support for the role of the internet as an efficacious conveyor of information about foreign countries and their people. The internet was not only a significant predictor of international knowledge, but also had the largest standardized coefficient of any of the news media measures. This suggests that the internet, with its powerful interactivity, control, organization and multi-channel attributes, is poised to help Americans address their historically low levels of understanding of foreign affairs, countries and people. In addition, the current study found that attention to internet and network TV news offers people a synergistic benefit, one larger than can be achieved by attention to either of the two media alone. In a broad sense, these comparative and synergistic findings indicate that the internet may play a positive role in drawing the corners of the world closer, diminishing the importance of time and space and ushering forth a closely intertwined global village (McLuhan, 1962, 1964). In such a village, the internet can serve as a conduit of simultaneous information flows (Castells, 2000), as well as simultaneous communication and interaction,

which can allow people of one country to experience events from afar as though they were actually there (McLuhan, 1962).

While the current study attempts to explain these findings in terms of the various attributes of different media, future research should help pinpoint which aspects of the internet and its users are responsible for the impact that internet news use can have on international knowledge development. Such research should consider the internet efficacy and experience levels of users, and what information-seeking and information-processing strategies internet users rely upon when trying to learn about foreign countries, events and issues. Such research could be conducted via telephone surveys or experiments. Future research should also consider whether internet users process international news differently depending on whether the US is involved or not in a news event. International news coverage in the US media has historically been laden with news stories that involve the US (Beaudoin and Thorson, 2001; Weaver and Wilhoit, 1981), with American readers being more interested in international news that involves the United States than international news that does not (Bogart, 1981). With the rise in terrorist events over the past few years – and the connection of these events to other countries, especially those in the Middle East – it could be that people's use of the media for international information will change, as do their levels of interest and anxiety related to terrorism and the proximity and threat of related terrorist happenings.

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APPENDIX: Statement in survey indices

International interest

I am interested in international geography.

I am interested in the economic conditions of other nations in the world.

I am interested in the histories of other nations.

I am interested in the political happenings of other nations.

Measured on a nine-point scale from 'strongly agree' (9) to 'strongly disagree' (1).

News attention

How would you rate your level of attention to international news items when you read a daily newspaper?

How would you rate your level of attention to international news items when you watch the network news on NBC, ABC or CBS?

How would you rate your level of attention to international news items when you watch the news on cable networks like CNN, MSNBC or FOX news?

How would you rate your level of attention to international news items when you get news information from the internet?

Responses from 'no attention at all' (0) to 'very close attention' (8).

International knowledge

What is the capital of mainland China?

During the late 1960s and early 1970s, Mao Zedong inaugurated a movement of Chinese youth to wipe out traces of the cultural and social systems. Schools were closed and intellectuals were persecuted. The name of the movement was what?

Which of the following best describes a Communist society?

Recently, Chinese courts sentenced 37 members of a spiritual movement to prison for holding gatherings and distributing handbills. What is the name of this spiritual movement?

Which of the following best describes the government of mainland China? A top Chinese official recently cautioned the Bush administration to avoid weapons sales to an island nation near mainland China. What is the name of this island nation?

The Chinese government recently held a US surveillance plane and its crew of 24 following what incident?

Who is the current president of mainland China?

What is the capital of Great Britain?

Winston Churchill was the Prime Minister of Great Britain during what war?

Who is the current Prime Minister of Great Britain?

Recently, hundreds or thousands of animals have been slaughtered in Great Britain in an attempt to stamp out a highly infectious livestock disease. What is the disease they are trying to stop?

What type of government does Great Britain have?

Which of the following regions is not part of Great Britain?

The British Prime Minister recently mentioned his intent to have Britain join other nations in using a single, common currency. What is the name of this single currency?

The general election in Great Britain was recently postponed. Why was it postponed?

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