Patterns of Internet and Traditional News Media Use in a Networked Community

SCOTT L. ALTHAUS and DAVID TEWKSBURY

The growing popularity of the World Wide Web as a source of news raises questions about the future of traditional news media. Is the Web likely to become a supplement to newspapers and television news, or a substitute for these media? Among people who have access to newspapers, television, and the World Wide Web, why do some prefer to use the Web as a source of news, while others prefer traditional news media? Drawing from a survey of 520 undergraduate students at a large public university where Internet use is woven into the fabric of daily life, this study suggests that use of the Web as a news source is positively related with reading newspapers but has no relationship with viewing television news. Members of this community use the Web mainly as a source of entertainment. Patterns of Web and traditional media exposure are examined in light of computer anxiety, desire for control, and political knowledge. This study suggests that even when computer skills and Internet access become more widespread in the general population, use of the World Wide Web as a news source seems unlikely to diminish substantially use of traditional news media.

Keywords computer anxiety, desire for control, Internet, media replacement, newspapers, on-line news, political knowledge, television news, uses and gratifications, World Wide Web

Will the World Wide Web become a supplement or substitute for traditional news media? As the World Wide Web became popularly accessible only with the advent of Mosaic browser software in 1993, it is still unclear at this early stage of the Web’s development how dominant it is likely to become as a provider of daily news to the general public. Yet the rapid spread of on-line news outlets raises profound questions about the future of traditional newspapers and television news programs. The number of newspapers around the world being published on the Internet rose from 20 in 1994 to nearly 4,000 in 1997. In the United States alone, of the more than 2,000 newspapers publishing on-line in 1997, 492 were general-circulation papers that updated their

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An earlier version of this paper was presented at the meeting of the Midwest Political Science Association, April 23–25, 1998, Chicago. The authors thank Scott Hale and Dave Brandon for their assistance in collecting the data for this study, and Susan Herbst and the anonymous reviewers for their valuable comments on earlier versions of this article.

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content at least daily (Meyer, 1998). Today, every major television network and cable news service provides information content from servers on the World Wide Web, and many news services such as AllPolitics exist only on the Internet. Whether the burgeoning number of Internet news outlets is a response to or a stimulus for popular demand, it is clear that there now exists a large and rapidly expanding audience for on-line news. Surveys by Louis Harris and Associates suggest that, by early 1998, 30% of American adults were using the World Wide Web (Birdsell, Mizzio, Krane, & Cottreau, 1998). Another national survey found that 20% of American adults were accessing Internet news sources at least weekly by mid-1998, as compared with just 6% in 1996 (Pew Research Center for the People and the Press, 1998).

The popularity of Web-based news services and the burgeoning number of on-line news outlets raise the possibility that sizable audiences might abandon newspapers and television news in favor of an on-line news medium that is in many ways more convenient, timely, and information-rich than traditional print and broadcast media. To address the question of whether the Web is likely to replace or augment traditional news media, it becomes important to determine whether people who regularly use the Web to keep up with current events are watching less television news or spending less time reading newspapers than people who rarely use the Web for this purpose.

While a few studies using survey data from the U.S. adult population have begun addressing the media substitution question—we discuss these findings later—it is unclear how well the patterns among current users will reflect media usage trends in a not-too-distant future when computer access and Internet navigation skills become more widespread than they are today. What is clear from these studies is that current users of on-line news services not only have greater access to and familiarity with computer technology than people who do not use the Internet, but they also have very different demographic and attitudinal characteristics than the general adult population (Birdsell et al., 1998; Cyber Dialogue, 1998a, 1998b; Davis & Owen, 1998; Hughes & Hill, 1998; Pew Research Center for the People and the Press, 1996b, 1998). Moreover, the continuing evolution of Internet technology and consumption patterns ensures that any study of the general adult population’s Internet use will be extremely time-bound. Current users of Internet news sources tend to read newspapers and watch television news more frequently than people who do not use a computer (Pew Research Center for the People and the Press, 1998), a pattern that seems to be related to the higher levels of political knowledge and political engagement found among current users of on-line technologies (Davis & Owen, 1998). Because early adoption of Internet technology is conflated with greater interest in the news, the media consumption patterns among Internet users may change dramatically as use of computer technologies becomes more widespread in the general population. More generally, the rapid and ongoing expansion of the ranks of Web users means that results from even the highest quality sample surveys become dated quickly and thereby limited in generalizability across time.

Our study takes a different approach to the substitution question by examining news consumption patterns within an unusual but theoretically important group of people: members of a fully networked university community. This group is by no means representative of the larger adult population, and we are quite certain that the patterns of media use in this university’s student population do not generalize to patterns of news consumption that might be found in a broader cross section of American society. Yet even as we harbor no illusions about the unrepresentative nature of this population, we nevertheless believe that the media use patterns found in this networked community are of great theoretical interest to the media replacement question. Because on-line users in
this population are not self-selected, and because on-line technologies are woven into the daily fabric of life in this community, news consumption choices are already based on criteria that will become more important in the networked society of 5 or 10 years hence. The news habits developed within this community result not from an uneven social distribution of computer skills and access but, rather, from the unique needs that are better satisfied by on-line or traditional news media.

By examining patterns of on-line and traditional news media use in such a community, our study hints at media use patterns that might manifest themselves in future years. In particular, we can address two questions about the potential impact of the World Wide Web on traditional news media that are less amenable to analysis in general population studies. First, among people with high levels of computer skills and free access to the Web but widely varied news consumption habits, is the Web perceived as a viable substitute for traditional news media? And second, what effect does heightened use of the Web as a news source have on usage patterns for traditional news media?

The special population analyzed in this exploratory study also allows us to test hypotheses about use of the Web as a news medium that can shed new light on the reasons why some people prefer to consume news from a particular medium. We extend recent work on the role of political knowledge as a determinant of media choice and introduce new findings on the impact that desire for control over one’s information environment has on news consumption patterns. The next section discusses the political importance of media substitution and then outlines reasons to expect the Web to become a replacement for traditional news media. Following that are sections describing the methodology and findings from our analysis.

Political Relevance of New Information Technologies

One potential concern with new information technologies like the World Wide Web is the extent to which they hasten the erosion of shared public space and the fragmentation of political discourse. For instance, news services geared toward satisfying the demands of smaller and more specialized audiences have proliferated on the World Wide Web and other “new” media such as cable television. To the extent that such offerings fragment existing audiences for traditional news media, the growing popularity of narrow-casting technologies represents a sharp break with the “common carrier” model for news outlets, in which the news media are seen as providing a forum for the exchange of viewpoints and advocacy of interests that reaches across all groups in a society (Commission on Freedom of the Press, 1947). To the extent that mass media act as a conserving force in democratic societies by providing citizens with shared collective experiences (Abramson, Arterton, & Orren, 1988; Dayan & Katz, 1992; Graber, 1997; Mendelsohn & Nadeau, 1996), by providing members of a society with shared symbolic orders needed for mutual recognition (Bennett, 1998), or by ritually representing a society to itself (Bennett, 1996; Carey, 1989; Herbst, 1994), the potential that the Web might become the primary news medium for even a modest segment of the population casts a shadow over the long-term health of the body politic.

These concerns all share a common thread: Each is predicated on the notion that the more people come to rely on the Web as a news source, the less they will rely on traditional news media such as printed newspapers and broadcast television. If audiences for new information delivery systems also continue to use traditional news media, then the extent of their exposure to these traditional media would probably limit whatever potential the new technologies have to isolate individuals in customized information environments.
The extent to which new communication media displace existing media has been a concern of media researchers for some time, and historical patterns confirm that increased audience fragmentation typically results from the introduction of new media technologies (Abramson et al., 1988; Davis & Owen, 1998; Dizard, 1997; Webster, 1989; Webster & Phalen, 1997). Moreover, the introduction of new media typically erodes the audience base for traditional media (Becker & Shoenbach, 1989; Davis & Owen, 1998; Dobrow, 1990). While this does not mean that new media inevitably supplant old media, the historical patterns of competition among mass media provide strong support for the replacement hypothesis. In the United States, motion pictures, radio, newspapers, and network television all declined in popularity as newer media technologies were developed and diffused (DeFleur & Ball-Rokeach, 1989; Merrill & Lowenstein, 1971; Neuman, 1991, pp. 117–119). One reason for this tendency is suggested by the principle of relative constancy (McCombs, 1972; McCombs & Nolan, 1992; Son & McCombs, 1993). As newer media enter the marketplace and are adopted, this theory goes, spending on existing media tends to decline because audiences have limited amounts of money and time that must be reallocated across both old and new media. Replacement of old media by new media is the result.

There has been plenty of speculation about whether on-line news delivery systems will serve as a supplement or substitute for traditional news media, with some observers suggesting the possibility of replacement among younger cohorts (Dizard, 1997, p. 200; Heikkinen & Reese, 1986; Leo, 1997) and others predicting that Web-based news services will augment traditional news media, at least among “news junkies” (Davis & Owen, 1998). Yet evidence on this point from recent surveys of on-line users is mixed. For instance, one of the few random national surveys of Internet users found that roughly a third think they are spending less time watching television in order to be on line (Cyber Dialogue, 1998a), and another found that computer owners and people who go on-line are less likely to watch television news or read newspapers (Pew Research Center for the People and the Press, 1996a). In contrast, a recent Pew Center survey found that only 11% of people who visit on-line news services reported using traditional news sources less often (Pew Research Center for the People and the Press, 1998).

The best publicly available evidence thus suggests no firm conclusion about whether the Web is likely to become a replacement for traditional news media. Today, the choice of using the Internet depends first and foremost on whether a person already possesses the minimal skills and computer equipment needed to access Internet content, two resources that are still in limited and uneven supply (U.S. Department of Commerce, 1998). At some point in the not-too-distant future, the choice between new and traditional media will depend more on how well these technologies satisfy particular interests and needs of individual consumers than on the current social distribution of necessary equipment and skills. As we suggest in the next section, there are good reasons to expect that large segments of existing news audiences might well abandon those media for newer information technologies like the World Wide Web.

**Why Internet Users Might Desert Traditional News Media**

At the core of any argument about media substitution is the assumption that audiences are active rather than passive consumers of media. This view can be traced to the earliest studies of news consumption (e.g., Berelson, 1949) and has long been a part of political communication research.1 Within the broad literature that has grown up around the active audience phenomenon, the theoretical work on uses and gratifications is perhaps most
relevant to the media substitution hypothesis. A central tenet of the uses and gratifications tradition is that people are intentional and selective in their use of media (Levy & Windahl, 1984; Perse, 1990; Rosengren & Windahl, 1972; for reviews, see Katz, Blumler, & Gurevitch, 1974, and Rubin, 1994). In other words, people use media strategically: They employ different media for different purposes, and they select among media based on how well each medium helps them meet specific needs or goals (Katz et al., 1974; Katz, Gurevitch, & Haas, 1973). Underlying this perspective is the assumption that people evaluate their available media options and choose among media on the basis of those evaluations. To the extent that a medium is perceived as superior for meeting a particular need or serving a particular function, people should be likely to choose that medium over others for fulfilling the need or function.

Much of the research on uses and gratifications has been concerned with identifying the specific gratifications satisfied by use of media (Rubin, 1994; Swanson, 1992). While the resulting typologies often reflect the particular methods and approaches of the researchers, a number of core gratifications are common to these typologies. One of the most common is some element of information seeking or surveillance (e.g., Greenberg, 1974; Katz et al., 1973; Lometti, Reeves, & Bybee, 1977; Rayburn, Palmgren, & Acker, 1984; Rubin, 1984; Wenner, 1986). The surveillance gratification seems particularly important for understanding audience choices among available news media. As might be expected, the use of newspapers, news magazines, and television news is more reliably predicted by surveillance needs than by needs for entertainment, escape, or the desire to avoid boredom (Vincent & Basil, 1997). But gratifications other than surveillance can also lead audiences to differentiate among news outlets. For instance, Rayburn et al. (1984) reported that viewers of morning television news programs tended to seek different gratifications from “Good Morning, America” than from the “Today” show. This suggests that the choice among available news outlets might hinge not only on an outlet’s usefulness for surveillance but also on its ability to fulfill secondary or tertiary gratifications: Ability to entertain or usefulness for passing time might be just as important as richness of information as an evaluative criterion for choosing among alternative news sources.

Much of the uses and gratifications research examines relatively stable relationships between audiences and their choice of media. However, this perspective implies that when a new medium becomes available, audiences will evaluate the usefulness of the new option relative to older media for satisfying existing demands. When a new medium is used for the same purposes as an older medium, the new medium is a functional alternative to the older medium, and audiences should choose between them by determining which one better satisfies particular needs (Heikkinen & Reese, 1986; Levy & Windahl, 1984; Robinson & Jeffres, 1979; Rosengren & Windahl, 1972; Williams, Rice, & Rogers, 1988; Wright, 1960; see also McCombs, 1972). As the Web can be seen as a functional alternative to traditional news sources such as television and newspapers, the potential for media substitution brought about by the introduction of the Web hinges on identifying the particular constellation of needs currently supported by its functional equivalents. If the Web meets these needs better than traditional news media, or if it satisfies demands that could not be fulfilled owing to the structural limitations of traditional news media, then we might expect audiences to shift toward the Web and away from newspapers and television.

The uses and gratifications literature posits that the gratifications people seek from media exposure arise from specific social and psychological needs (Finn & Gorr, 1988; Katz et al., 1974; McGuire, 1974), but little attention has yet been paid to the empirical
investigation of these needs (Swanson, 1992). A small number of researchers interested in the use of the new media have been exploring the relationship between information-seeking goals and new media use (e.g., Cowles, 1989; Dobos, 1992; Dozier & Rice, 1984; Eighmey & McCord, 1998; Garramone, Harris, & Anderson, 1986; Heikkinen & Reese, 1986; Jeffres & Atkin, 1996; Rafaeli, 1986). These studies identify several structural features of the World Wide Web that may play a role in audience perceptions about the medium’s ability to meet surveillance needs. For instance, Williams, Phillips, and Lum (1985) suggest that interactive videotex services—a precursor to today’s Web—provided users with expanded choice and interactivity (see also Dozier & Rice, 1984). These elements of the medium meant that people could explore topical areas in more depth and with greater control over the flow and delivery of information. In the context of the Web today, these attributes are still central to understanding how people may perceive the medium (Williams, Strover, & Grant, 1994).

The Internet has an almost limitless capacity to store and transmit information. Even when traditional news services move on-line, they often supplement their normal fare with additional news and features. Thus, a central feature of news consumption on the Web is the capacity users have to track issues and events in much greater depth than is the case with traditional media. Rather than relying on the tastes and gatekeeping preferences of editors and producers of the traditional media, Internet users are able to pick and choose among content options, thus personalizing their news consumption (Newhagen & Rafaeli, 1996).

The asynchronous nature of news on the Web also distinguishes it from the established news media (Williams et al., 1994). Traditional network news programs and newspapers typically follow a well-defined cycle of news gathering and presentation. A television news program contains a limited amount of information, and audiences receive that information only when it appears in the program. Newspapers provide information only once a day and only in the quantities and formats chosen by editors. Consumption of news on the Internet is much more under the control of the user. People can visit the Web any time of day to receive up-to-date information on nearly any topic they choose. Thus, use of the Internet for news consumption affords users considerable control over their information environments.

Given these unique structural features, we expect the Web to excel as a surveillance medium at meeting two particular needs that we describe subsequently: need for information and desire for control. Yet we also expect the choice between the Web and traditional media to hinge on a person’s level of comfort with computer technology, and thus we anticipate that computer anxiety should mediate the choice between new and traditional news outlets.

Need for Information

Persons with higher levels of political knowledge typically follow news of public affairs much more closely than those with lower levels of political knowledge (Neuman, Just, & Crigler, 1992; Price & Zaller, 1993; Zaller, 1992). Moreover, people with high levels of political knowledge seem to be drawn toward relatively more information-rich news sources like newspapers and away from relatively information-poor sources like television (Neuman et al., 1992). This tendency has been interpreted as suggesting that higher levels of political knowledge may be associated with a “need for information” best satisfied by news outlets such as newspapers that contain high levels of public affairs coverage and are amenable to active information-seeking strategies (Chaffee &
Frank, 1996; Chaffee & Kanihan, 1997; Heikkinen & Reese, 1986). Thus, while high levels of political knowledge should be associated with a general increase in news surveillance, they should also be associated with increased reliance on the most information-rich news sources.

In this light, we might expect on-line news sources to be particularly appealing for those with relatively high levels of political expertise or sophistication, a finding confirmed in data from the 1996 American National Election Studies (Davis & Owen, 1998, pp. 166–167). A similar pattern was observed in a study examining the choice between traditional newspapers and videotex services (Heikkinen & Reese, 1986). This study found that people with a low need for information based their choice on familiarity with the two media, with older people more likely to choose newspapers and younger people the electronic medium. People with a high need for information, on the other hand, tended to adopt both. Our expectation is also consistent with previous work on audiences for newspapers and television news showing that those seeking out information tend to choose newspapers over television (e.g., Chaffee & Frank, 1996; Chaffee & Kanihan, 1997). If the Web is more information rich than newspapers, we should expect that people seeking information would turn increasingly toward on-line news sources.

**Desire for Control**

Uses and gratifications theory suggests that a desire to actively control one’s information consumption should be a determinant of media choice (Katz et al., 1973). Specifically, people who seek to manage their external environment should be more likely to use media that afford greater levels of control. The “desirability of control” personality construct (Burger & Cooper, 1979) appears to tap elements of such a basic motivational tendency. People who desire control tend to take leadership positions in group situations and prefer to make decisions for themselves. In terms of gratifications, this suggests that the desirability of control should be positively associated with a general surveillance orientation toward the media. Thus, it would seem reasonable to suggest that people high in desire for control would be most likely to report Internet and other media use for the specific instrumental goal of surveillance. Because the Internet appears to provide users with more control over their information environments, people high in this construct should also tend to be drawn more strongly to the Internet than to traditional news media.

This emphasis on the desirability of control personality construct is important on two levels. As Swanson (1992) noted, relatively few studies have linked media gratifications to their psychological antecedents. Thus, the present research contributes to the uses and gratifications literature by addressing an underdeveloped area of theory and research. More important, if desirability of control proves to be a substantial predictor of Internet and other media use, it may turn out to be a useful construct for other domains of political communication. To our knowledge, no study has yet attempted to assess the importance of desire for control as a predictor of news consumption.

**Computer Anxiety**

Previous work has suggested that news audiences may engage in habitual use of media that are already familiar to them (Miller & Reese, 1982; Neuman, 1991; Rubin, 1994). Such a “channel orientation” may work against the adoption of new media (Heikkinen & Reese, 1986), in part by encouraging people to seek only those gratifications that
familiar media already satisfy. For example, while the Web allows people to exercise great control over their information environments, the opportunity costs associated with adopting this new technology (e.g., gaining access to a networked computer, learning basic computer skills and Internet navigation techniques) may cause some people to devalue the kind of control that the Web provides. In this way, the choice between the Web and traditional news outlets is likely to be mediated by a person’s familiarity and level of comfort with computer technology.

An obvious predictor of Internet use is “computer anxiety.” one’s level of apprehension at the prospect of using a computer (Heinssen, Glass, & Knight, 1987). This anxiety reflects both negative affect and low levels of confidence regarding computer use (Heinssen et al., 1987; for a more recent review, see Scott & Rockwell, 1997). It seems reasonable to expect that comfort with using computers may influence willingness to use the World Wide Web and other elements of the Internet. To be sure, WebTV and other technologies on the market are attempting to solve this problem by redesigning the primary interface with the Internet, but thus far the Internet is still widely perceived as a computer-based medium. Work on computer anxiety therefore suggests that among people who are interested in keeping up with the news, higher levels of computer anxiety will incline them to rely on traditional news outlets and avoid the Web as a source of news.

In sum, a uses and gratifications perspective suggests that as access to and familiarity with Internet technology become more widespread, the comparative advantages and disadvantages of this medium relative to traditional media will become clearer to the general public. To the extent that the Internet becomes perceived as superior to traditional media for particular tasks or activities, it seems likely that individuals valuing those attributes will increasingly turn to new media and away from traditional news media. We suggest that since people spend time with particular media in part because those media provide useful ways to attain specific goals, the increased familiarity with new media technologies in a networked community should lead people to conclude that these new technologies are more useful for particular tasks or activities. Our expectations can be formally expressed in five hypotheses.

Hypothesis 1: The World Wide Web is perceived as a useful medium for keeping up with current issues and events.

Hypothesis 2: Desire for control and political knowledge should be positively related to time spent reading newspapers, watching television news programs, and using the World Wide Web for surveillance.

Hypothesis 3: Desire for control and political knowledge should be more strongly related to time spent using the World Wide Web for surveillance than to time spent using newspapers or television news.

Hypothesis 4: Computer anxiety should be negatively related to time spent using the World Wide Web for any purpose, including surveillance.

Hypothesis 5: After accounting for factors that increase surveillance generally and decrease use of the Web in particular, time spent using the World Wide Web for surveillance should be negatively related to time spent reading newspapers and watching television news programs.

In other words, we expect to find support for the replacement hypothesis only after controlling for desirability of control and political knowledge, which should generally increase time spent on all news media, and for computer anxiety, which should decrease reliance on the Web for news. After controlling for these factors, we expect that the more frequently people use the Web for surveillance, the less they should use newspapers and television news for the same purpose.
Methodology

Data for this study come from a survey administered to a convenience sample of 520 undergraduate students at a large public university in the midwestern U.S. Regardless of their experience with computers or Internet technology before coming to the university, once enrolled students, are quickly acclimated to the navigation skills and basic computer knowledge essential for successfully using the World Wide Web. For instance, after the first semester of their freshman year, all students at the university are required to register for courses using a university server on the World Wide Web. Students are routinely required to use e-mail or Web technology in undergraduate courses. In addition to extensive computer lab facilities located throughout the campus, every dorm room in university residence halls has a direct Ethernet connection to the Internet, making access to e-mail and Internet services particularly convenient for those living on campus. Internet technology is so tightly woven into the fabric of everyday life that the campus at which this study took place has been nationally recognized as one of the top five most “wired” colleges and universities in the United States (Greenman, Bernstein, & Gan, 1998), and the community surrounding the university has been recognized as one of the 10 most “wired” locations in the world (Levy, 1998).

The survey, which was conducted during March and April 1997, consisted of a self-administered questionnaire on topics that included beliefs about the characteristics of various media, general attitudes toward computer technology, frequency and patterns of using the World Wide Web, and estimates of time spent using various media. The survey was administered to students enrolled in large, lower-division speech communication courses. Because these courses fulfilled general education requirements, the students taking them represented a wide range of academic interests and intended majors. Surveys were administered during regular meetings of discussion sections containing between 10 and 21 students each, and students typically took approximately 15 to 20 minutes to complete the survey.

Dependent and Independent Variables

Desirability of Control. Our desirability of control scale consists of eight Likert-type questions from the 20-item scale reported in Burger and Cooper (1979). The question wordings and response stems are displayed in the Appendix. We summed the scores for the eight items in the scale and divided by the number of items in the scale to produce a variable ranging from 1 to 7, with smaller values indicating lower levels of desire for control. This scale has an alpha reliability of .76 and a mean of 5.33 (SD = 0.89).

Political Knowledge. We assessed levels of political knowledge with factual knowledge questions from the National Election Studies$^2$ that were recommended by Delli Carpini and Keeter (1993, 1996). Our political knowledge index was constructed by adding together the number of correct responses to eight factual knowledge questions.$^3$ The alpha reliability for this index is an acceptable .72, and the mean political knowledge score is 4.20 (SD = 2.03).

Computer Anxiety. Our computer anxiety scale consists of eight items selected for their relevance from the larger computer anxiety scale analyzed by Heinsessen et al. (1987). The question wordings and response stems for this scale, which has an alpha reliability of .85, are displayed in the Appendix. The variable derived from this scale, produced by the same
method as that used for the desirability of control scale, ranges from 1 to 7 with a mean of 2.67 (SD = 1.04). Smaller values indicate lower levels of computer anxiety.

**Time Spent Using Various Media.** Our estimate of hours per day reading a newspaper was derived by multiplying the answers to two questions: “During an average week, on how many days do you read a newspaper (including the [daily university newspaper])?” and “On days when you read a newspaper, about how many hours do you spend reading it?” Both questions were open-ended, with a blank space indicating days per week or hours per day as appropriate. Multiplying these variables for each individual and taking the mean of the individual products produces a daily estimate of time spent reading newspapers. The mean for the entire group of respondents was 18.28 minutes per day (SD = 19.2).

Our estimate of hours per day watching television news programs comes from an open-ended question: “On a typical weekday, about how many hours do you spend watching news programs on television? In your estimate, include viewing of CNN, local and network news programs, magazine shows such as ‘Dateline NBC,’ and any other news programs.” Note that our definition of television news programs includes prime time magazine shows as well as local and national nightly news programs. Estimates of hours per day watching entertainment programs on television came from a question that read “On a typical weekday, about how many hours do you spend watching entertainment programs on television? In your estimate, include viewing of music videos, comedies, dramas, soap operas, talk shows, films, and any other entertainment programs.” Note that this definition of entertainment programming is not limited to a particular time of day, nor is it limited to entertainment material found only on broadcast television. For all respondents, the mean time spent watching news programs on television was 34.43 minutes per day (SD = 40.86), and the mean time spent watching entertainment programs on television was 98.03 minutes per day (SD = 94.97).

Two estimates of time spent on the Web were used in the analysis. The first item produced a general estimate of days per week on which the Web is used: “We are interested in how frequently people use the World Wide Web. From among the alternatives given below, please indicate the category that comes closest to describing your frequency of use.” The response options to this closed-ended question were “have never used it,” “have used it only a few times,” “once every few weeks,” “1 or 2 days per week,” “3 to 5 days per week,” and “every day.” Responses to this question were subsequently coded into a measure of days per week, with values of 0, 0.05, 0.25, 1.5, 4, and 7 corresponding to the appropriate response categories. The mean for all respondents was 3.00 days per week (SD = 2.53). A second closed-ended item estimated the number of days per week on which the Web was used for surveillance. The question stem read “Apart from electronic mail, we are interested in how people use the World Wide Web. How often, if ever, do you use the Web to engage in each of the activities below?” Our estimate of using the Web for surveillance came from the activity “Use the Web to keep up with current issues and events.” This question had the same six response options as the first question and was coded accordingly. The mean for all respondents on this item was 0.91 days per week (SD = 1.68).

**Likelihood of Using Different Media for Specific Purposes.** To assess our subjects’ perceptions about the usefulness of various media for different purposes, we asked several questions about the likelihood of using particular media for specific purposes. For example, the question tapping use of media for surveillance read “Assuming you did not
have to worry about the cost or availability of the media below, how likely would you be to use each as a way of keeping up with current issues and events?” Other questions substituted the italicized portion with “a way to find information that is useful for making decisions or accomplishing tasks,” “a source of entertainment,” and “a way of passing some time.” Following each question was a list of media that included “World Wide Web,” “A daily newspaper,” “Television news,” and “Prime time television drama and comedy programs.” Subjects rated their likelihood of using a particular medium for a specific purpose on 7-point Likert scales anchored by “very unlikely” and “very likely.” Means and standard deviations for these items are reported in Table 1.

**Results**

**Preliminary Analysis: Characteristics of the Student Population**

Female students were overrepresented in our survey—58% in the survey versus 45% for the campus as a whole, including graduate students—and our survey overrepresented lower-division students (79% of respondents were freshmen, 14% were sophomores, and only 7% were juniors or seniors). In other respects, the students in our sample appeared to be representative of the student body as a whole. The median age for our respondents was 19 years.

As expected, the students in our sample were quite familiar with computer technology. Fully 7 out of 10 respondents said they owned a personal computer, which is higher than the estimated 37% of households owning computers in the general U.S. population at the time this study was conducted (Pavlik, 1998, p. 227). Regardless of whether students owned computers or not, regular use of the World Wide Web was widespread, with 73% accessing the Web at least once per week and 22% on a daily basis. Only three respondents said they never used the World Wide Web.

**Likelihood of Using Television, Newspapers, and the World Wide Web for Different Purposes**

Our data support the first hypothesis, that respondents should perceive the World Wide Web as being useful for keeping up with current issues and events. Many respondents said they regularly used the Web as a surveillance medium. While 18% of our respondents

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<th>Television news</th>
<th>Daily newspaper</th>
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<tr>
<td>Surveillance</td>
<td>1.96 (1.37)</td>
<td>1.74 (1.43)</td>
<td>0.81 (1.72)</td>
<td>0.25 (2.11)</td>
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<td>Making decisions</td>
<td>0.58 (1.59)</td>
<td>0.83 (1.56)</td>
<td>0.84 (1.60)</td>
<td>–1.36 (1.67)</td>
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<td>Entertainment</td>
<td>0.10 (1.77)</td>
<td>0.09 (1.71)</td>
<td>1.23 (1.71)</td>
<td>2.50 (1.01)</td>
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<tr>
<td>Passing time</td>
<td>0.69 (1.62)</td>
<td>0.87 (1.69)</td>
<td>1.52 (1.66)</td>
<td>2.41 (1.12)</td>
<td>167.71</td>
</tr>
</tbody>
</table>

**Note.** Standard deviations are shown in parentheses. Changes in subscripts across rows indicate significant \( p < .05 \) differences revealed by \( t \) tests between the means of adjacent cells. \( F \) ratios have between 516 and 519 degrees of freedom, and all are significant at the \( p < .001 \) level.
said they never used the Web to keep up with current issues and events, 4% (n = 21) said that they used the Web every day for this purpose, and a total of 28% (n = 145) reported using it at least once per week for surveillance.

While it is clear that many respondents use the Web for surveillance purposes, these patterns do not reveal whether they perceive the Web as a surveillance medium. For insight into this question, it is necessary to compare the perceived usefulness of the Web relative to traditional surveillance media. Table 1 shows the mean responses among all respondents to questions asking how likely they would be to use different media for various purposes. “Prime time television drama and comedy programs” is included as a comparison category to check the validity of our other media measures, as we expect that respondents should generally use prime time television for different purposes than television news or newspapers. Likewise, to establish the validity of our surveillance measure, we also include responses to questions asking how likely respondents were to use a medium for finding information that is useful for making decisions, as a source of entertainment, and as a way of passing some time, each a potential gratification sought from these media. In Table 1, use of each medium is rated from −3 (very unlikely) to 3 (very likely) for each of the four purposes, so any positive value can be read as “relatively likely” and any negative value can be read as “relatively unlikely.”

Findings reported in Table 1 suggest that the World Wide Web is a medium that, like television, is put to a wide variety of uses and attracts users for a wide variety of reasons. For keeping up with current issues and events, our respondents said they were somewhat more likely to use television news than newspapers but much more likely to use either television news or newspapers than the World Wide Web. Paired-sample t tests revealed these differences to be significant at the p < .05 level. We also compared individual responses to the questions from Table 1 to see how many subjects reported being more likely to use the Web than traditional news media for keeping up with current issues and events (data not shown). Only 20% of subjects were relatively more likely to use the Web for surveillance than they were to use newspapers, and the same percentage was relatively more likely to turn to the Web instead of television news to keep up with current issues and events. In contrast, 56% of respondents were more likely to rely on newspapers and 60% were more likely to rely on television news than the Web for surveillance purposes.

While most of our respondents said they were less likely to use the Web than traditional surveillance media, this tendency obscures important differences in likelihood of using the Web for surveillance among the most and least frequent Web users (data not shown). Among those who used the Web less than once per week for any purpose (n = 138), the Web was relatively unlikely to be used for keeping up with current issues and events (M = −.09), with this group preferring television news (M = 2.04) and then newspapers (M = 1.59) for surveillance. Paired-sample t tests for all of these differences were statistically significant at the p < .05 level. Among those who used the Web on a daily basis for any purpose (n = 110), the Web was the most preferred surveillance medium (M = 1.95), followed closely by newspapers (M = 1.74) and television news (M = 1.56); however, only the difference between television news and the Web achieved conventional levels of significance (t = 2.10, p < .05). These patterns suggest that while most respondents see television news and newspapers as relatively more useful than the Web for keeping up with current issues and events, those respondents who use the Web most frequently find it to be at least comparable and perhaps even superior to traditional news media.

Comparing differences in Table 1 within each column rather than across rows con-
firms that, in the eyes of our respondents, the perceived usefulness of the Web is more similar to prime time television than to television news or newspapers. Our respondents reported being more likely to use the Web for diversionary purposes than instrumental ones. Passing time was rated as the most likely use for this medium, followed by entertainment and then by a tie between making decisions and surveillance (all differences were significant at the $p < .05$ level except that between making decisions and surveillance, which is not significant). In contrast, respondents said they were most likely to use television news and newspapers for surveillance and only somewhat likely to use these media for entertainment or passing time (all differences between surveillance and other purposes were significant at the $p < .05$ level for each of these media).

The clarity of patterns in gratifications sought both across and within the different media reinforces the importance of the uses and gratifications perspective for understanding the choice of media among functional alternatives. People use different media for different purposes, and the reason for using a particular medium becomes important for understanding why time spent using one medium might be positively or negatively related to time spent using another. We would expect media substitution to occur when two media are used for a similar purpose but one is more accessible or seen as better than the other for achieving this purpose. Our respondents find the Web useful for keeping up with current issues and events but tend to view it primarily as an entertainment medium and only secondarily as a news medium. To the extent that the World Wide Web is viewed primarily as a diversionary medium, it may not be perceived as an adequate substitute for more instrumental media such as television news or newspapers.

Is the Web a Supplement or Substitute for Traditional News Media?

The first step in testing the substitution hypothesis is to examine the influence of variables that should generally increase surveillance activity across all news media. Our second hypothesis suggests that desire for control and political knowledge should be positively related with time spent using television news, newspapers, and the Web for keeping up with current issues and events. Table 2 reports the bivariate correlations among these variables. To confirm the validity of our media use measures, in this table we include as comparison categories hours per day watching entertainment television and days per week using the Web for any purpose.

The findings reported in Table 2 offer strong support for our second hypothesis. Desirability of control has significant positive correlations with time spent reading newspapers, watching television news, and using the Web for surveillance. Political knowledge also has significant positive correlations with use of the Web for surveillance and with reading newspapers but is not significantly associated with time spent watching television news. Furthermore, both of these variables are also significantly related to time spent watching entertainment television: The higher the desirability of control or level of political knowledge, the less time spent watching prime time entertainment programs on television.

Having confirmed that both of these variables are associated with increased surveillance activity in general, the next step is to identify variables that should differentially affect the use of various media for surveillance activity. Our third hypothesis suggests that political knowledge and desirability of control should be more strongly related to Web use than to time spent with traditional news media, and our fourth hypothesis suggests that computer anxiety should diminish time spent using the Web for any purpose, including surveillance. The findings reported in Table 2 confirm both of these hypotheses.
Table 2
Pearson correlations among variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Days per week using Web for surveillance</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Hours per day reading newspaper</td>
<td>.13**</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Hours per day watching TV news</td>
<td>.02</td>
<td>.15**</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Days per week using Web for any purpose</td>
<td>.57***</td>
<td>.01</td>
<td>−.01</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Hours per day watching TV entertainment</td>
<td>−.05</td>
<td>.01</td>
<td>.43***</td>
<td>−.13**</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Computer anxiety</td>
<td>−.29***</td>
<td>.10*</td>
<td>−.07</td>
<td>−.42***</td>
<td>.01</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Desirability of control</td>
<td>.20***</td>
<td>.11*</td>
<td>.10*</td>
<td>.09</td>
<td>−.10*</td>
<td>−.27***</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>8. Political knowledge</td>
<td>.19***</td>
<td>.11*</td>
<td>−.02</td>
<td>.22***</td>
<td>−.11*</td>
<td>−.13**</td>
<td>.14**</td>
<td>—</td>
</tr>
</tbody>
</table>

*p < .05. **p < .01. ***p < .001.

Table 2 shows that both need for control and political knowledge were more strongly correlated with using the Web for surveillance than with time spent using newspapers or television news. These observed differences in correlations were all found to be significant at the p < .05 level via Fisher’s correlation difference test. Moreover, it is important to point out that the correlation between political knowledge and desirability of control is a modest but significant .14, which means that each of these variables exerts an independent influence on the amount of time allocated among the media considered here. These findings are consistent with prior research suggesting that politically knowledgeable people seek out more information-rich media like newspapers, while those with lower levels of knowledge tend to prefer television as a news source (e.g., Neuman et al., 1992). The novel finding in our data is the equally strong relationship between media choices and desire for control.

In line with the substitution hypothesis, these findings suggest that higher levels of desirability of control and political knowledge are associated with greater reliance on
the Web than on television news or newspapers for surveillance. Yet we should point out that the correlations in Table 2 may give a misleading impression on this point owing to the different metrics of our media use measures and to the baseline differences in time spent using various media. To clarify the actual relationships, we divided respondents into two knowledge groups and two control groups based on their scores on the respective scales. We placed those falling above the median score in the high knowledge group and those falling below the median in the low knowledge group, and did likewise for the desirability of control scale. Among the high desirability of control group, newspapers and television news programs were still by far the most frequently used sources of news. This group reported an average of 35 minutes per day viewing news programs on television and 19 minutes per day reading newspapers while using the Web for news surveillance only slightly more than 1 day per week. People in the high knowledge group averaged 33 minutes per day viewing television news programs and 20 minutes per day reading newspapers, but likewise reported using the Web for surveillance an average of slightly more than 1 day per week. Thus, while desirability of control and political knowledge do indeed covary in the expected ways with time spent using various news media, most of our respondents nevertheless rely on traditional news media for the bulk of their surveillance activity.

Table 2 also confirms our fourth hypothesis on the expected relationships between computer anxiety and media consumption choices. The typical finding is for heightened levels of anxiety about computer technologies to be negatively related to use of those technologies (e.g., Heinsen et al., 1987; Scott & Rockwell, 1997), a finding confirmed in our data. Higher levels of computer anxiety were significantly and negatively related to time spent using the Web for any purpose and for surveillance in particular. Yet, computer anxiety was more strongly related to overall time spent on the Web \( r = -0.42 \) than it was to time spent on the Web for surveillance \( r = -0.29 \), suggesting that a need for surveillance may mitigate the typical relationship between computer anxiety and Web use.

Computer anxiety was not significantly related to viewing news or entertainment programs on television, but it was positively and significantly related to newspaper reading. While it seems puzzling at first glance, this apparent relationship is mostly an indirect effect of gender differences in newspaper use. Regressing frequency of newspaper reading on computer anxiety and gender results in a nonsignificant coefficient for anxiety and a highly significant coefficient for gender (data not shown). Computer anxiety seems related to newspaper reading in these data only because women in our study were more anxious about computers than men and also spent less time reading newspapers than men.

Our fifth hypothesis suggests that controlling for differences in news consumption due to desire for control, political knowledge, and computer anxiety should reveal that time spent using the World Wide Web for surveillance is negatively related to time spent consuming newspapers and television news programs. A first cut at this possibility is given by the zero-order relationships between media use measures reported in Table 2. If time spent on the Web takes away from time spent with other media, we should find Web use to be negatively correlated with use of other media. Our data show that the number of days per week on which people used the Web for keeping up with current issues and events is positively and significantly correlated with hours per day reading a newspaper and uncorrelated with hours per day watching television news programs. These findings suggest that use of the Web for surveillance supplements newspaper reading but has no relationship with viewing television news. The only evidence of zero-order media
substitution in Table 2 is the negative correlation between overall use of the Web and time spent viewing entertainment programs on television, a modest but significant −.13.

While suggestive, the simple correlations among these media use variables obscure the interrelationships among several important factors that may incline people to spend more time with one medium and less with another. To examine why subjects might prefer one news medium over another, we therefore analyzed patterns of news media use with ordinary least squares multiple regression. Our analysis focused on five dependent variables: average hours per day spent watching television news programs, watching television entertainment programs, and reading newspapers and average number of days per week on which the Web was used for any purpose as well as specifically to keep up with current events and issues. The independent variables of primary interest in each equation are also the time use variables for different news media. For example, in this arrangement average hours per day spent reading newspapers is used as a dependent variable in one equation and as an independent variable in the other equations. If people use the World Wide Web as a substitute for traditional news media, then, after controlling for the effects of other independent variables, we should find the likelihood of using the Web for surveillance to be negatively related to hours spent watching television and reading newspapers. Moreover, to the extent that one medium is used as a substitute for another, the impact of this negative relationship should be reciprocal across equations. In other words, if every minute spent reading a newspaper takes a minute away from viewing television, then we should find negative relationships when predicting television watching from newspaper reading as well as when predicting newspaper reading from television watching.\(^6\)

Table 3 reports the results of this multivariate regression analysis. The amount of variance explained in each equation ranges from 6% to 45%, with higher \(R^2\) values produced by the equations that include independent variables from the same medium as the respective dependent variables. Thus, much of the variance explained by four of the five equations can be attributed to the tendency among people in our study to prefer one medium over another for accomplishing a variety of goals: Viewing television news programs is strongly related to viewing entertainment programs on television, as use of the Web for surveillance is a better predictor than any other variable for overall time spent using the Web.

Many of the significant zero-order relationships reported in Table 2 between media use and political knowledge, computer anxiety, and desirability of control disappear when controlling for the effects of other variables. Political knowledge becomes an insignificant predictor in all of the equations when entered simultaneously with variables for time spent using various media. As political knowledge is significantly correlated in Table 2 with four of the five media use variables, it appears that the effects of political knowledge are operating indirectly through the media use variables in Table 3. In a similar pattern, computer anxiety retains a significant relationship only with overall Web use despite having significant and sizable bivariate correlations with three of the five media use variables. As mentioned earlier, the spurious zero-order relationship between computer anxiety and newspaper reading disappears when controlling for gender. When entered simultaneously with the two Web use measures, the effect of computer anxiety on use of the Web for surveillance operates indirectly through the overall Web use measure and retains no significant direct impact. In contrast, desirability of control achieves statistical significance in four of the five equations, lacking explanatory power only in the case of newspaper reading. That desirability of control should retain its significance
after controlling for political knowledge and use of other media suggests that this construct is worthy of further study by political communication researchers.

The data in Table 3 render an unmistakable verdict on our fifth hypothesis. Contrary to our expectations, the findings from our multivariate analysis support the null hypothesis that the use of the World Wide Web for surveillance supplements rather than substitutes for the use of traditional news media in this networked community. After controlling for the effects of computer anxiety, desirability of control, and political knowledge on media consumption patterns, it becomes clear in these data that traditional news media do not seem to compete directly with each other or with the Web for news

<table>
<thead>
<tr>
<th></th>
<th>Days per week using Web for surveillance</th>
<th>Hours per day reading newspaper</th>
<th>Hours per day watching TV news</th>
<th>Days per week using Web for any purpose</th>
<th>Hours per day watching TV entertainment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer anxiety</td>
<td>-.05</td>
<td>-.06</td>
<td>-.04</td>
<td>-.28***</td>
<td>-.03</td>
</tr>
<tr>
<td>Desirability of control</td>
<td>.14***</td>
<td>.04</td>
<td>.13**</td>
<td>-.11**</td>
<td>-.14**</td>
</tr>
<tr>
<td>Political knowledge</td>
<td>.04</td>
<td>.07</td>
<td>.01</td>
<td>.07</td>
<td>-.08</td>
</tr>
<tr>
<td>Days per week using Web for surveillance</td>
<td>---</td>
<td>.14*</td>
<td>-.03</td>
<td>.43***</td>
<td>.05</td>
</tr>
<tr>
<td>Hours per day reading newspaper</td>
<td>.10*</td>
<td>---</td>
<td>.15***</td>
<td>-.09**</td>
<td>-.06</td>
</tr>
<tr>
<td>Hours per day watching television news</td>
<td>-.02</td>
<td>.18***</td>
<td>---</td>
<td>.05</td>
<td>.45***</td>
</tr>
<tr>
<td>Days per week using Web for any purpose</td>
<td>.51***</td>
<td>-.16**</td>
<td>.07</td>
<td>---</td>
<td>-.18**</td>
</tr>
<tr>
<td>Hours per day watching television entertainment</td>
<td>.04</td>
<td>-.07</td>
<td>.45***</td>
<td>-.13**</td>
<td>---</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>.35</td>
<td>.06</td>
<td>.22</td>
<td>.45</td>
<td>.22</td>
</tr>
<tr>
<td>$F(9, 478) =</td>
<td>30.01***</td>
<td>4.54***</td>
<td>16.21***</td>
<td>45.16***</td>
<td>16.13***</td>
</tr>
<tr>
<td>$n$</td>
<td>488</td>
<td>488</td>
<td>488</td>
<td>488</td>
<td>488</td>
</tr>
</tbody>
</table>

Note. Cells contain beta coefficients. All equations control for gender (male = 1, female = 0) and required use of the Web for coursework (currently required to use the Web = 1, else = 0). The coefficients for these variables are omitted to facilitate interpretation of the measures of interest.

*p < .05. **p < .01. ***p < .001.
audiences. The association between viewing television news programs and reading newspapers is statistically significant and positive in both the newspaper and television news equations. Likewise, the relationship between using the Web for surveillance and reading newspapers is positive and significant in both the newspaper and Web surveillance equations. In both cases, the more time our respondents spent with one medium, the more time they spent with the other. Table 3 also shows that likelihood of using the Web for surveillance has no statistically significant relationship with watching television news programs: Neither equation contained a statistically significant relationship between time spent with these media.

Our fifth hypothesis is clearly not supported by these data. In the networked community studied here, the World Wide Web is used to supplement traditional news media. But the last two equations in Table 3 also confirm the finding from Table 2 that the World Wide Web is in direct competition for audience attention with entertainment programs on television. Controlling for time spent using the Web for surveillance, these equations show that the greater the overall time spent using the World Wide Web, the less the time that respondents spend viewing televised entertainment programming. In both equations, the relevant coefficients are significant and negatively signed.

In addition, while it does not appear that news audiences are substituting media in these data, the equations for newspaper reading and overall Web use reveal a relationship that was not apparent in the zero-order correlations from Table 2. After controlling for amount of time spent using the Web for surveillance, Table 3 shows that the more time given to reading newspapers, the less time spent using the Web for all purposes, and vice versa. This relationship is negative and statistically significant in both equations, suggesting that the Web may indeed be used as a substitute for newspapers. But in light of the positive relationship between Web surveillance and newspaper reading just discussed, it also appears that what is being substituted is not the kind of content that we normally define as “news.” Indeed, this relationship serves as a reminder to political communication scholars that people consume news products for reasons other than informing themselves about current issues and events.

Conclusion

Our study suggests that members of this networked community use the World Wide Web mainly as a source of entertainment and only secondarily as a source of news. Moreover, our analysis of people who have the computer access and skills needed to integrate the Web into their routine mix of media channels found evidence that the Web supplements traditional news media, a finding consistent with recent general population studies exploring similar issues (Davis & Owens, 1998; Hughes & Hill, 1998; Pew Research Center for the People and the Press, 1996b, 1998). We found evidence that using the Web as a source of news may be positively related to reading printed newspapers, although we found no clear connection between use of the Web for surveillance and viewing television news programs. Nonetheless, our data suggest that while the Web supplements traditional news media, it may be in direct competition with entertainment programming on television. The behavior of respondents in our sample suggests that entertainment rather than news content is more likely to lose audience members to the Web. But to the extent that we can generalize from our data to a more fully networked society of the future, it appears unlikely that more than a small portion of the existing audience for traditional news media will abandon those media for Internet news sources.
One explanation for the apparent lack of media substitution may lie with the uses to which people are putting available news media. It seems that use of the Internet for surveillance may fulfill a need separate from that served by use of traditional news media. It may be that the diversity of information available on the World Wide Web allows users to explore interests not normally available in the older media. That is, it may be that the sort of information most attractive to the users studied here is of a different character than the mainstream news carried in the traditional print and electronic outlets. If so, then Internet sites may be staking out a new content territory, one that does not directly impinge on that held by the other media. This territory may include, as Noh and Grant (1997) suggest is the case with the VCR, meeting interpersonal and social interaction needs not primarily served by traditional media (see Rice & Williams, 1984). Interactivity has certainly been touted as a key feature of the Internet, and the patterns we found in our data may be indirect evidence of the social value of interactivity.

In addition, our findings about the relationship between desire for control and media exposure reveal a pattern that has not previously been studied by political communication researchers. Desire for control is at least as strong a predictor of news exposure as political knowledge in our data, and it retains its explanatory power even after controlling for political knowledge. While the generalizability of our findings is quite limited, the strength of this relationship suggests the need for additional work on desire for control as a predictor of news exposure.

As with any study, our conclusions are only as good as the data from which they are drawn. Besides the obvious limitation of our unrepresentative sample, we recognize five other limitations in our data that might affect the generalizability of our findings. First, the definition of television news used to measure daily time patterns is very broad, measuring time spent viewing prime time news magazines such as “Dateline NBC” and “60 Minutes” as well as local and national news broadcasts. Limiting the definition of television news to local and national nightly broadcasts might produce different usage patterns than those reported here. Second, survey participants were overwhelmingly in their first or second year at the university, which means that they may not have been fully socialized into the computer culture of the university’s networked environment. It is possible, for this and other reasons, that patterns of media use might be different for juniors and seniors, but unfortunately there were too few upperclassmen in our pool of respondents to reliably test for this possibility. A third caveat is that because ours is a cross-sectional rather than over-time analysis, we have no way of identifying the extent to which media substitution might occur among individuals over time (see Robinson & Jeffres, 1979). If patterns of new and traditional media use were systematically to shift over one’s tenure in the university community, we would be unable to detect such changes in our data. Fourth, this study examines media use patterns in an environment where computer equipment is conveniently available to all students and where full Internet access is provided to all students without charge. Because of this, our study might overestimate the amount of time that individuals would spend with Internet technology if they had to pay for Web access and necessary computer hardware.

A final limitation of our data relates to the rapid pace of innovation for Internet and computer technology. As the technology for interfacing users with Internet content evolves, it is likely that usage patterns for new media will also change. Current browser programs such as Netscape Navigator and Microsoft Explorer are simple enough to use, but the hardware they reside on requires Internet news consumers to actively process news in front of a computer terminal. Unlike television, which allows audiences to more passively consume news content while performing other tasks, Web-based information
delivery systems still require users to be quite intentional and focused in their consumption of information content. As the technologies linking users with Web content evolve to allow more passive consumption of news reports, our findings will probably become increasingly time bound.

The results of this study challenge the conventional wisdom about the revolutionary nature of the Internet. A common assumption among academic observers and media professionals is that widespread adoption of the Internet for news consumption will be accompanied by corresponding decreases in traditional media use. Political observers have speculated about the societal-level changes that could occur as a result. Economic rearrangement of the media industries, audience fragmentation, and political dissolution are among the changes that have been suggested to follow from massive displacement by the Internet. While the present study does not explore the mechanisms by which these effects may occur, our findings suggest that the underlying premise of displacement needs to be examined more closely than it has been in the past. The growing number of subscribers to services such as America Online may not spell doom for the morning newspaper and the evening news broadcast. The increasing complexity of the media environment means that people have more choices and options than in the past. Scholars and professionals need to be wary of shortchanging that complexity in assuming that media consumption is a zero-sum process.

Notes

1. The idea that audiences exercise great latitude in interpreting media texts according to personal predispositions and habitually attend to particular aspects of media content while ignoring others was used to explain the apparent lack of widespread persuasive effects from exposure to news media (Klapper, 1960) and is at the heart of constructionist approaches to political communication (Crigler, 1996; Just et al., 1996; Neuman, Just, & Crigler, 1992).

2. These include open-ended questions asking which job or political office was held by Newt Gingrich, William Rehnquist, Boris Yeltsin, and Benjamin Netanyahu; forced-choice questions asking which branch of federal government had the final responsibility to nominate judges and decide whether a law was constitutional; and forced-choice questions asking which party has the most members in the U.S. House of Representatives and U.S. Senate.

3. Each correct response was given a score of 1, and each incorrect or “don’t know” response was given a score of 0. For the open-ended name questions only, a partially correct response was given a score of .5.

4. We also obtained an estimate of daily Web use from a question that read “On a typical weekday, about how many hours do you spend using the World Wide Web?” The mean for all respondents combined was 53 minutes per day. While estimating time using the Web as average hours per day provides an easy way of comparing time allocations across media, further inspection of our data led us to conclude that this particular measure of hourly Web use is likely to suffer from reliability problems. Although our respondents were able to estimate a daily total for their Web usage when prompted to do so, the days per week measure of overall Web use showed that only 22% of respondents reported using the Web on a daily basis, with the median response as 1 or 2 days per week. The disparity between these estimates suggests that this second measure of Web use is a more reliable indicator of time spent using the Web. The remainder of this analysis therefore estimates Web use in days per week rather than hours per day.

5. It is important to point out that since most of our subjects scored fairly low on the computer anxiety scale, “high” anxiety about computers should be interpreted merely as relatively higher than the least anxious subjects: Dividing respondents at the median of the computer anxiety scale shows that Web use among the high anxiety group averaged 2 days per week. This suggests that even those relatively more anxious respondents are fairly comfortable with computer technology.
6. Besides the independent variables related to our hypotheses, we included two additional controls in our regression equations. Several studies of Internet usage patterns have emphasized how gender contributes to the social stratification of new technology users, with males typically found to be overrepresented among Internet users (Cyber Dialogue, 1998b; Hughes & Hill, 1998; Pew Research Center for the People and the Press, 1996b). In addition, many of our respondents reported that they were currently required to use Internet technologies for courses in which they were enrolled, a factor unrelated to our variables of interest that could nonetheless be expected to increase the amount of time spent on the Web. We controlled for the potential influence of these factors by including dummy variables for gender (male = 1, female = 0) and for required use of the Internet (1 = currently required to use the Internet, 0 = currently not required) in each of the five equations. In the analysis that follows, we do not report the coefficients for these variables since they are of marginal relevance to the question of media substitution.

References


Swanson, D. L. (1992). Understanding audiences: Continuing contributions of gratifications re-


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**Appendix: Scale Items and Response Items**

**Computer Anxiety Scale**

We are interested in your thoughts about using computers. Please indicate your level of agreement with the statements given below. [Responses for each question form a 7-point Likert scale from “strongly agree” (1) to “strongly disagree” (7).]

1. I feel I will be able to keep up with the advances happening in the computer field.
2. I am confident that I can learn computer skills.
3. I have difficulty in understanding the technical aspects of computers. (reverse coded)
4. The challenge of learning about computers is exciting.
5. I have avoided computers because they are unfamiliar and somewhat intimidating to me. (reverse coded)
6. If given the opportunity, I would like to learn about and use computers.
7. I look forward to using computers on my job.
8. Learning to operate computers is like learning any new skill—the more you practice, the better you become.
Desirability of Control Scale

Listed below are a number of statements concerning personal attitudes. Please read each item and indicate the extent to which each statement applies to you. There are no right or wrong answers. [Responses for each question form a 7-point Likert scale from “does not at all apply to me” (1) to “definitely applies to me” (7).]

1. I enjoy making my own decisions.
2. I prefer to take the leadership role when I’m involved in a group project.
3. I like to wait and see if someone else is going to solve a problem so that I don’t have to be bothered by it. (reverse coded)
4. There are many situations in which I would prefer only one choice rather than having to make a decision. (reverse coded)
5. I would prefer to be a follower rather than a leader. (reverse coded)
6. When it comes to orders, I would rather receive than give them. (reverse coded)
7. I’d rather run my own business and make my own mistakes than listen to someone else’s orders.
8. I prefer a job where I have a lot of control over what I do and when I do it.