The World Wide Web as a Functional Alternative to Television

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The World Wide Web as a Functional Alternative to Television

Douglas A. Ferguson and Elizabeth M. Perse

This study was designed to explore the similarities between television and the World Wide Web (WWW). We adopted a uses and gratifications framework to assess whether Web surfing is a functional alternative to television viewing. A sample of computer-experienced students completed an on-line questionnaire and a three-day on-line media-use diary. We found that three major and two minor television-like reasons for Web surfing: Entertainment, Pass Time, Relaxation, Social Information, and Information. Our respondents used the Web for school, play, to acquire information and materials, and, to some extent, for work. The WWW may be functionally similar to television, especially in its use for diversion. But there are indications that the WWW may not be as relaxing a use of time as television viewing.

1997 was the year that viewing television and navigating the World Wide Web (WWW) began to collide. Microsoft entrepreneur Bill Gates bought Web Tv from Philips and encouraged cable television networks to adopt his digital standards, a kind of TVML for HTML (Caruso, 1997; Markoff, 1997). On-line search engines like Yahoo! began reaching more adults than many popular network television shows: 25.4 million unduplicated users per month (Simpson, 1997). The Internet service AOL, led by MTV-founder Bob Pittman, officially adopted the TV-channel metaphor of presenting on-line content (Lohr, 1997). A study of teenagers in Connecticut found that many were adapting their television zapping behaviors for use on the Web (Weber, 1997). It was thus no surprise that industry observers and media scholars began to wonder if the convergence of Internet users and television viewers was finally a reality (Clark, 1997).

Not everyone is sanguine about the merger of the old and new webs. Some writers are concerned that the WWW will isolate people and lead to a fragmented society (e.g., Stoll, 1995). Parents and educators worry about the availability of indecent content on the WWW compared to the relatively "decent" (albeit violent) program-

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ming on television. And television broadcasters worry about losing their status as a dominant medium as WWW surfing displaces television viewing.

This study explored the similarity of television viewing and World Wide Web "surfing." Specifically, we were interested to see whether the WWW is a functional alternative to television viewing for a sample of young adults who have both Internet access and computer experience: college students attending "wired" universities. We focused on the reasons they go to the WWW, how much time they spend on the Web, and what sites they visit. Although the WWW is only one use of the Internet, we focused on it rather than e-mail, newsgroups, or other uses because it is the Web that has drawn media-related industries and multimedia content that resembles that of other mass media.

World Wide Web

The World Wide Web has captured public attention. Exponential growth in Internet hosts (CommerceNet, 1997) and personal computer adoption has led to dramatic increases in on-line activity. A CommerceNet/Nielsen Media Research Survey (CommerceNet, 1998) estimated that 79 million Americans were on-line in June 1998 (with 68 million using the WWW). The same study estimates the number will continue to increase to about 126 million WWW users by 2000. While overall numbers are still small compared to the size of the television audience, there is evidence that in the near future the WWW may find a role as a mass medium. Although search engines are among the most popular Web sites (Nielsen Media Research, 1997), music (e.g., Sony, MTV), television (e.g., CBS, NBC, FOX), movie (e.g., Movieweb, Disney) and news (e.g., *USA Today*, CNN) sites are also the most popular (100 Hot, 1997). Top sites for women surfers are Barnes and Noble and Warner Bros. Men's favorite site is ESPN (Investor's Business Daily, 1998). Young people have embraced the WWW. A *Newsweek* survey ("Teenagers and Technology," 1997), for example, found that 61% of teens aged 12-17 surf the Web regularly.

WWW use and television viewing. A major concern of research on home computing has been how the computer affects time spent on other activities, especially the mass media. Many believe that traditional media use will diminish. Coffey and Stipp (1997) cited these three reasons. First, limitations on free time mean that, as computer use increases, other free time activities have to decrease. Second, computers, especially the interactivity offered by the Internet and WWW, are more interesting than other media because of greater mental engagement. Third, today's children will grow up using computers more than their parents' generation.

Most studies do conclude that computer use is associated with declines in media use. Reagan (1987), for example, noted that young home computer owners were less likely to listen to the radio, read newspapers, and watch local and network television news than nonowners. Television viewing, however, seems to be the most vulnerable to erosion. In 1985, Rogers found that early adopters of computers said that their television viewing had declined 1.5 hours a day since they bought home computers. That same year, Vitalari, Venkatesh, and Gronhaug (1985) observed that 67% of their

sample reported to spend less time watching television after buying home computers. More recent surveys reinforce these findings. The Pew Foundation's (1997) study of news use found evidence that news viewing declines for consumers of on-line news sites. Over one-third of the Web users in a 1997 survey reported that they surf the Web instead of watching television; 27% of the respondents note that the Web replaced TV viewing on a weekly basis (Graphics, Visualization, & Usability Center, 1997).

These studies' findings, though, have been criticized, because they are based on specialized samples, self-report, and retrospective measures. Analyses of "yesterday's" activities revealed that computer users' patterns of television viewing are not very different from those of computer nonusers (Robinson, Barth, & Kohut, 1997). Going on-line did not have any significant impact on television usage. The researchers concluded that declines in media usage seem unrelated to computer use.

Coffey and Stipp (1997) suggest that computer use still does not compete directly with television use. They note that behavioral records of computer use show that only 7% of owners are using their home computers during television's prime time. Most people with computers keep them out of the rooms in which television is viewed (Media Metrix, 1997). The people who use the Internet most heavily tend not to be the biggest TV watchers (Crispell, 1997). In fact, computer ownership and on-line use is associated with greater print media use (Perse & Dunn, 1998; Robinson et al., 1997).

WWW as a Functional Alternative to Television

Uses and gratifications offers another explanation for changes in media use following adoption of new media technologies. According to this perspective, people use media they believe will help them achieve their goals (Katz, Blumler, & Gurevitch, 1974). Few media are uniquely capable of fulfilling all goals, so people select from among functional alternatives, or media that can fill similar goals (Perse & Courtright, 1993). Cable television and videocassette recorders (VCR), for example, are functional alternatives to broadcast television for relaxing entertainment. But both cable and VCRs generally fulfill that need better (Perse & Courtright, 1993). This may account for the decline in broadcast television viewing among cable subscribers and VCR owners.

Uses and gratifications suggests that an important first step to understanding whether the WWW can displace television use is to see whether the WWW is a functional alternative to television viewing. In order for the WWW to be a functional alternative to television, its use should be undertaken for similar reasons. Research has consistently found that television is used mainly for relaxing entertainment, followed by needs to pass time and for information (e.g., Rubin, 1981a, 1984). On the other hand, various surveys suggest that information is the dominant use of the WWW (e.g., Graphics, Visualization, & Usability Center, 1997; Katz & Aspden, 1996; Kaye, 1998). Entertainment is only modestly endorsed by respondents; passing time and relaxation are rarely mentioned.

Our first research question is designed to uncover the salience of typical television motives for WWW users.

RQ$_1$: What are the television-related motives for using the World Wide Web?

Not all computer activities appear to be functional alternatives to television use. Word processing, record keeping, and communication are all important computer uses that do not compete functionally with television. Even major uses of the WWW, such as searching for product information, keeping up with hobbies, and download-ing software (Emerging Technologies Research Group, 1997), do not seem to compete functionally with television's dominant content – drama, comedy, sports, and news.

Our next research question considers the various activities of the audience of the WWW to determine whether they are similar to the dominant content of television.

RQ$_2$: What are the dominant activities on the World Wide Web?

Predicting Web Use

Uses and gratifications holds that knowing why people use media helps to explain not only choices among functional alternatives, but also the content of specific media (e.g., Emerson & Perse, 1995; Palmgreen, Wenner, & Rayburn, 1981; Rayburn, Palmgreen, & Acker, 1984; Rubin, 1984). With television, information motives are generally linked to watching news programs (Rubin, 1981b; Rubin, Perse, & Powell, 1995); entertainment and relaxation motives are associated with watching drama and comedy (e.g., Rubin, 1984). Television sports viewing is motivated by excitement and social utility motives (Gantz & Wenner, 1991). As part of this study of the similarities between television viewing and the WWW, we explored which motives for using the WWW were associated with various Web activities and surfing to various Web sites.

RQ$_3$: Which television-related motives are linked to various WWW activities?
RQ$_4$: Which television-related motives are linked to use of different WWW sites?

Uses and gratifications research has also shown that different motives are associated with different levels of media use as well as differing levels of affinity, or perceptions about the importance of a medium. Ritualistic television use, or watching television out of habit and to pass time, is associated with higher levels of television viewing and affinity (Rubin, 1984). Instrumental use, or watching television to seek information, is typically linked to greater news use, but overall lower levels of television viewing and affinity (Rubin, 1984). To see how similar television is to the WWW, two research question ask how different reasons for using the WWW are linked to amount of time spent on the Web and affinity for the WWW.

RQ$_5$: Which television-related motives for using the World Wide Web are associated with greater Web use?

RQ$_6$: Which television-related motives for using the World Wide Web are associated with greater affinity for the WWW?

World Wide Web Repertoire

Media scholars and policymakers have been interested in the diversity of media content available to the audience. Channel repertoire represents the number of different television channels that individuals choose to watch (Heeter, 1985). One consistent finding is that people make use of only a small subset of all the cable channels available; channel repertoires generally number fewer than 12 (Ferguson, 1992; Ferguson & Perse, 1993). Television channel repertoire is usually linked to structural determinants (access to media and time spent with media). So higher channel repertoire is associated with cable television subscription (access to more channels), greater television use (greater access to the medium), and more channel changing (access to more channels).

Sites on the WWW are more numerous and diverse than cable television channels. Some estimates suggest that there are over 19 million Internet hosts with distinct IP addresses (CommerceNet, 1997). In order to understand how much of the WWW users explore, our last research question examines how the WWW audience begins to make sense of this mass of content. We expect that structural determinants associated with Web access (computer access, connection speed, and time spent on the Web) will be associated with higher Web repertoires. But given the complexity of the technology and the vast number of sites available on the WWW, we also expected that some individual user attributes will also have an impact on Web site repertoire. Specifically, we expect that computer and WWW expertise will facilitate navigation around the Web, resulting in higher Web repertoire. And we expect that the different ways that people seek out Web site information will also differentiate how many sites they regularly visit.

RQ$_7$: How are Web access, computer expertise, and WWW search strategies associated with WWW repertoire?

Method

Procedure and Sample

An online survey was conducted in October and November, 1997, among 250 college students at two universities, one in the Midwest and one on the East Coast. These students were an especially appropriate sample to study WWW use because they attended universities that provided Internet access in computer labs across campus and in dorm rooms with direct Ethernet connections to the Internet. Moreover, these students were enrolled in courses that involved instruction and assignments on the Web, including course home pages and required readings posted in PDF format on the Web.

As part of the study, the respondents first completed a questionnaire coded in

HTML and linked to course Web pages and then kept a three-day diary of media use, including television, radio, print, recorded audio, and the World Wide Web. The diaries were submitted from a course Web site as part of a separate assignment. Completed surveys ($N = 236$) and diaries ($N = 201$) were received from 236 respondents, all of whom received extra-credit in mass media courses for their voluntary participation. The HTML-coded survey assigned least (0) to most (8) for most of the scaled responses, with the assigned default value (9) for don't know/no response. The diaries were open-ended questions by medium, with fill-in boxes for specific content by title and for time spent with each medium, in minutes. Unless noted below, all questions referred specifically to the World Wide Web.

The Sample

The sample was 51.1% male (coded 0, female coded1) and ranged in age from 17 to 46 ($M = 19.94$, $SD = 2.59$). Of the sample, 59.7% had access to a computer where they lived and, of those, 70.4% had access to the Internet . This compares to the 1996 national computer adoption rate of 40% in 1996 (Nielsen, 1996). As expected, the sample was somewhat computer literate. The average respondent had been using computers for almost 6 years (range = 0 to 15, $M = 5.84$, $SD = 3.07$) and had been surfing the WWW for just over 2 years (range = 0 to 7, $M = 2.02$, $SD = 1.17$). Our sample used the Internet regularly, on the average 5.46 times a week (range = 0 to 100 times, $SD = 9.96$). They also checked their e-mail regularly, on the average 2.4 times a day (range = 0 to 10, $SD = 1.94$).

Expertise. Expertise was assessed by averaging responses to two questions about their experience with computers in general and with surfing the WWW. Responses to the two items were strongly correlated ($r = .70$), so responses were averaged to create a measure of computer and Web expertise. Expertise ranged from 0 to 8.00 ($M = 3.69$, $SD = 1.99$).

Television-Related Web Surfing Motives

Respondents indicated their agreement (0 = strongly disagree, 8 = strongly agree) with 27 statements about their own reasons for surfing the WWW. Because the purpose of this study was to explore the similarity between television viewing and WWW use, the statements were drawn from sets of television viewing motivations (*Rubin*, 1981a).

World Wide Web Uses and Perceptions

Web activities. Respondents indicated how often (0 = never, 8 = always) they surfed the Web for 12 different activities: just to browse, for entertainment, to kill time, to play around with multimedia, for product information, to download software and other material, to shop, for news, for other useful information), because I am

required to for school, because I am required to for work, and to gather information for school work . The statements were drawn from sets of Web surfing uses in previous research (Graphics, Visualization, & Utilities Center, 1995).

Use of WWW top sites. Respondents also marked which of the top 100 Web sites they had visited in the "past week." This list was compiled from a list of the 100 most popular Web sites from the week of September 11, 1997 (100 Hot, 1997). Of those sites, only 27 received 10 or more hits by our respondents. Those 27 sites were sorted into 7 categories: search engines (e.g., Yahoo! Alta Vista), entertainment (e.g., Pathfinder, Sony), sports (e.g., ESPN, CBS Sportsline), utilities (e.g., CNET, Download-.com), news (e.g., USA Today, ABC News), interactive (e.g, Hotmail, WebChat), and commerce (Virtual Flowers). Because each category had a different number of elements, responses were weighted by the number of total responses to the category. Those seven categories were used to represent the Web sites visited by our respondents.

Web exposure. Respondents indicated how many minutes they surfed the Web "yesterday morning," "yesterday afternoon," "last night," and "on a typical day." The number of minutes spent on the Web "yesterday" were summed and ranged from 0 to 420 minutes ($M = 35.11$, $SD = 56.21$). On a typical day, respondents reported spending an average of 1.64 hours (range = 0 to 12, $SD = 1.75$). These two estimates were modestly correlated ($r = .30$, $p < .001$), so "yesterday's" Web use was converted to hours and the two items averaged to create a measure of typical daily Web use. Daily Web use ranged from 0 to 7.28 hours a day ($M = 1.08$, $SD = 1.10$).

Web site repertoire. Because of the large number of Web sites available, we operationalized Web repertoire two ways. First, because these sites were the most popular at the time of the survey and the ones likely to compete with television viewing, we summed the number of top-100 Web sites visited by each respondent. Top-site repertoire ranged from 0 to 13 ($M = 4.41$, $SD = 3.08$). Then, from the diary data, we averaged the number of different Web sites visited over the 3-day diary period. Diary Web site repertoire ranged from 0 to 9 ($M = 1.53$, $SD = 1.35$).

Web site sources. Respondents indicated how often (0 = never, 8 = always) they found Web sites on the Internet from eight different sources: books, friends, hyperlinks in other Web pages, search engines, newsgroups, magazines or newspapers, e-mail signatures, and TV commercials. A principal components analysis with varimax rotation identified two factors that accounted for 51.8% of the variance: external sources and internal sources. Item responses were averaged to create scale scores for both strategies. External sources ranged from 1.00 to 8.00 ($M = 3.39$, $SD = 1.53$, $\alpha = .74$). Internal sources ranged from 1.00 to 8.00 ($M = 5.19$, $SD = 1.96$, $\alpha = .67$). Internal sources (hyperlinks and search engines) were used significantly more to locate Web sites: $t(233) = 12.62$, $p < .001$.

Affinity for the Web. Respondents marked their agreement with five items that assessed affinity for the WWW, adapted from a scale that assesses affinity for television (Rubin, 1981a).[1] Web affinity ranged from 0 to 6.40 ($M = 1.23$, $SD = 1.45$, $\alpha = .83$) .

Statistical Analysis

After scale construction and reliability analysis, several steps were taken to answer the seven research questions. To answer the first research question, which concerned the salience of television-related motives for using the WWW, principle components analysis with oblimin rotation ($\delta = 0$) was used to identify underlying television-related motives for surfing the Web. Oblimin rotation was used because research has demonstrated that television viewing motives are correlated (e.g., Rubin, 1981a; 1984). Then, paired t-tests identified significant differences among the strength of motives. The second research question, which concerned the various activities of the WWW, was answered in much the same way. Principal factors analysis with varimax rotation was used to identify the underlying structure of Web activities. Then, paired t-tests were used to locate significant differences among the frequencies of those activities.

Research questions 3, 4, 5, and 6 were explored two ways. First, Pearson correlations examined the bivariate relationships between the different television-related Web motives and Web activities, Web sites visited, amount of Web use, and Web affinity. Then, multiple regression assessed the multivariate relationships among each of the variables and Web motivations. We used the forced entry method, in which all variables are entered in a single step. Because gender and expertise generally affect television as well as computer behaviors (e.g., Nathanson, Perse, & Ferguson, 1997; Whitley, 1997), these were also entered into the equations as control variables.

The final research question explored whether the repertoire of different categories of Web sites was affected by some personal characteristics and by structural determinants related to computer use. This question was answered with multiple regression.

Results

Television-Related Web Surfing Motives

The first research question explored similarities between television use and surfing the WWW. The 27 Web surfing motives, their means and standard deviations are summarized in Table 1. It was clear that a few of the reasons for using the WWW were not salient to our respondents. So, items with means below 2.00 were eliminated from further analysis. The remaining 23 items were subjected to principle components analysis with oblimin rotation.

The analysis identified five factors that accounted for 67.4% of the unrotated solution's variance. The criteria for factor retention, based on prior research on television-viewing motives (e.g., Rubin, 1983) and comments on factor analysis (Hunter, 1980; Tabachnick & Fidell, 1983), were at least three loadings above .40. Based on these criteria, four of the five factors were retained: Entertainment, Pass

Time, Relaxation-Escape, and Social Information. Table 1 summarizes the factor analysis.

Factor 1, *Entertainment* accounted for 42.1% of the common variance in the unrotated solution. This factor signaled a use the WWW motivated by a search for exciting diversion. Factor 2, *Pass Time* accounted for 8.6% of the variance in the

Table 1
Television-Related Web Motive Principle Components Analysis

	Enter	Pass	Relax	Social
I surf the World Wide Web because It's enjoyable (5.36, 2.16)	.84	.09	.05	.03
It amuses me (4.76, 2.27)	.83	−.12	.12	.01
It's exciting (4.32, 2.43)	.80	−.03	.10	.00
It entertains me (5.77, 1.99)	.80	.27	−.08	.00
It's thrilling (4.00, 2.36)	.79	.04	.14	.01
I just like to do it (5.25, 2.26)	.78	.07	−.03	.15
It's a habit, just something I do (2.44, 2.42)	.45	−.04	.23	.14
It passes the time away, particularly when I am bored (4.03, 2.58)	.08	.72	.34	−.05
It gives me something to occupy my time (4.68, 2.40)	.36	.69	−.16	.02
When there is no one else to talk to or be with (2.82, 2.60)	−.16	.69	.44	−.16
When I have nothing better to do (4.28, 2.50)	.18	.68	.02	.03
Just because it is available (4.56, 2.32)	−.03	.52	−.11	.37
So I can forget about school, work or other things (3.03, 2.52)	.08	.01	.76	.07
So I can get away from what I'm doing (3.16, 2.4)	.06	.06	.74	.05
It allows me to unwind (3.52, 2.32)	.22	.17	.62	.05
It's a pleasant rest (3.36, 2.37)	.27	.01	.60	.12
It peps me up (2.19, 2.08)	.02	.03	.56	.17
It relaxes me (3.04, 2.46)	.30	.08	.54	.05
So I can visit the sites that my friends tell me about (4.33, 2.48)	.02	.03	−.04	.87
So I can talk with others about what I find (3.03, 2.39)	.04	.05	.18	.64
So I can learn how to do things that I haven't done before (4.29, 2.40)	.11	.05	.07	.59
So I can learn about what could happen to me (2.65, 2.12)	.06	.10	.25	.43
It helps me learn things about myself and others (4.51, 2.22)	.16	.00	−.12	−.03
*So I can get away from the family or others (1.90, 2.26)				
*It makes me feel less lonely (1.43, 1.94)				
*So I won't have to feel alone (1.17, 1.87)				
*So I can be like my friends and family who surf the Web (1.36, 1.94)				
Sum of Squared Loadings	4.11	2.21	2.47	2.53
Eigenvalue of unrotated factor	9.67	1.99	1.52	1.24
Variance explained in unrotated solution	42.1	8.6	6.6	5.3
Mean	4.90	3.95	3.06	3.89
SD	1.96	2.06	1.89	1.94
Internal Consistency Reliability	.92	.82	.88	.74

Note: Item means and standard deviations are in parentheses. Factor 2 refracted for Table entry.
*Items excluded from further analysis.

unrotated solution. This factor marked using the WWW to fill empty time. Factor 3, *Relaxation-Escape* accounted for an additional 6.6% of the common variance. It reflected using the Web to get away from work and to rest and relax. Factor 4, *Social Information* accounted for 5.3% of the variance in the unrotated factor solution. It focused on using the Web to find sites to learn and to spark conversations. The fifth factor was not interpreted because it was comprised of only a single item dealing with learning from the Web.

Item responses were averaged to create scale scores for each of the television-related Web surfing motives. Entertainment ranged from 0.00—8.00 ($M = 4.90$ $SD = 1.96$, alpha = .92). Pass Time ranged from 0.00—8.00 ($M = 3.95$, $SD = 2.06$, alpha = .82). Relaxation ranged from 0.00—8.00 ($M = 3.06$, $SD = 1.89$, alpha = .88). Social Information ranged from 0.00—8.00 ($M = 3.89$, $SD = 1.94$, alpha = .74).

Entertainment was the most salient motive for searching the Web. Paired *t*-tests showed that it was significantly more endorsed than Pass Time ($t[234] = 7.68$, $p < .001$), than Social Information ($t[234] = 8.25$, $p < .001$), and than Relaxation ($t[234] = 17.95$, $p < .001$). Surfing the Web to pass time was significantly more salient than Relaxation ($t[234] = 7.18$, $p < .001$) but did not differ significantly from Social Information ($t[234] = 0.39$, $p = .70$). Social Information was a significantly stronger motive for searching the Web than Relaxation ($t[234] = 6.73$, $p < .001$).

Web Activities

The second research question examines the sample's Web activities. The 12 Web activities were subjected to principal factors analysis with varimax rotation. Three factors that accounted for 50.5% of the variance were identified. Factor 1, *Play* (eigenvalue = 3.82), accounted for 31.8% of the variance. It included the following items: *just to browse, for entertainment, to kill time,* and *to play around with multimedia,* and reflected a set of diversionary activities. The second factor, *Acquisition* (eigenvalue = 1.76), accounted for 14.7% of the variance. This was a more goal-directed set of activities that included seeking product and current events information, downloading software and other material, and shopping. Factor 3, *School* (eigenvalue = 1.36), accounted for an additional 11.3% of the common variance. It too was a set of goal-directed activities aimed at getting information and material for school work. One statement, "Because I am required to for work," comprised a single-item fourth factor retained for the analyses because of the exploratory nature of the study.

Scores on the statements in each factor were averaged to create general categories Web activities. Play ranged from 1.00—8.00 ($M = 4.30$, $SD = 2.02$, $\alpha = .84$). Acquisition ranged from 1.00—7.20 ($M = 3.33$, $SD = 1.55$, $\alpha = .69$). School ranged from 1.00—8.00 ($M = 5.49$, $SD = 1.68$, $\alpha = .62$). Work scores ranged from 0—8.00 ($M = 2.59$, $SD = 2.85$).

Given the course requirements to work on the Web, it was not surprising that school activities were significantly more frequent for these students than play uses

(t[234] = 7.01, $p < .001$), acquiring information and software (t[235] = 15.52, $p <$ .001), and because they were required for work (t[221] = 13.78, $p < .001$). Play activities were more frequent than acquisition activities (t[234] = 7.92, $p < .001$) and work (t[220] = 7.09, $p < .001$). Acquiring materials from the WWW was engaged in more frequently than work activities: t(221) = 3.49, $p < .001$).

The number of top-100 Web sites visited by our respondents mirrors their endorsement of activities. Search engines were the most visited sites (n = 197), followed by entertainment (n = 110), sports (n = 74), utilities (n = 39), news (n = 73), interactive (n = 65), and commerce (n = 22).

Outcomes of Television-Related Web Surfing Motives

The next set of research questions concerned how the different television-related Web surfing motives are linked to various Web activities, the Web sites visited, amount of Web use, and affinity for the WWW. Table 2 summarizes the bivariate Pearson correlations.

Play activities were significantly related to all four television-related Web motives: Entertainment (r = .65, $p < .001$), Pass Time (r = .66, $p < .001$), Relaxation (r = .63, $p < .001$), and Social Information (r = .39, $p < .001$). Acquisition activities were also linked positively to all four television-related Web motives: Entertainment (r = .50, $p < .001$), Pass Time (r = .28, $p < .001$), Relaxation (r = .43, $p < .001$), and Social Information (r = .47, $p < .001$). School activities were related only to Social Information (r = .16, $p < .05$). Work was not significantly correlated to any of the four motives.

Table 2
Pearson Correlations: Television-Related Motivations to Surf the Web

	Entertainment	Pass Time	Relaxation	Social Inform
Play	.65	.66	.63	.40
Acquire	.50	.28	.43	.47
School	.03	−.08	−.03	.16
Work	−.04	−.10	.00	.05
Search Engines	.07	.05	.08	.15
Entertainment	.28	.18	.23	.25
Sports	.19	.06	.16	.16
Utilities	.14	.06	.08	.14
News	.17	−.09	.06	.14
Interaction	.18	.05	.11	.08
Commerce	−.02	−.03	−.03	.02
Web Use	.27	.20	.27	.20
Affinity	.30	.22	.43	.26

Note: r = .21, $p < .001$; r = .17, $p < .01$; r = .13, $p < .05$ (2-tailed).

Visiting Search Engines was related only to Social Information ($r = .15$, $p < .05$). Surfing to various Entertainment sites on the Web was linked significantly to all motives: Entertainment $r = .28$, $p < .001$), Pass Time ($r = .18$, $p < .01$), Relaxation ($r = .23$, $p < .001$), and Social Information ($r = .25$, $p < .001$). Accessing Sports sites was associated with Entertainment ($r = .19$, $p < .01$), Relaxation ($r = .16$, $p < .05$), and Social Information ($r = .16$, $p < .05$). Going to utilities Web sites was correlated with Entertainment ($r = .14$, $p < .05$) and Social Information ($r = .14$, $p < .05$) motives. Interaction Web sites were linked only to Entertainment ($r = .18$, $p < .01$). News sites visits were linked to Entertainment ($r = .17$, $p < .01$) and Social Information ($r = .14$, $p < .05$). Commerce site Web surfing was unrelated to any motives.

Amount of Web use and Web affinity were correlated positively and significantly to all four motives. Web use was linked to Entertainment ($r = .27$, $p < .001$), Pass Time ($r = .20$, $p < .01$), Relaxation ($r = .27$, $p < .001$), and Social Information ($r = .20$, $p < .01$). Web affinity was also linked to Entertainment ($r = .30$, $p < .001$), Pass Time ($r = .22$, $p < .001$), Relaxation ($r = .43$, $p < .001$), and Social Information ($r = .26$, $p < .001$).

Multiple regression was also used to explore the multivariate relationship of the four television-related Web surfing motives to Web activities and answer the third research question. The regressions are summarized in Table 3.

Motives, gender, and expertise explained 58.6% of the variance in engaging in play activities on the Web. Pass Time ($\beta = .38$, $p < .001$), Relaxation ($\beta = .24$, $p < .001$), and Entertainment ($\beta = .24$, $p < .01$) motives were significant contributors to the equation. Expertise ($\beta = .35$, $p < .001$), Social Information ($\beta = .26$, $p < .001$), and Entertainment ($\beta = .26$, $p < .01$) were significantly linked to acquiring material from the Web and accounted for 43.3% of the variance. Using the Web for school work was predicted significantly by gender (female, $\beta = .34$, $p < .001$) and Social

Table 3
Multiple Regression: Predicting Various Web Activities

	Play	Acquire	School	Work	Web Use	Affinity
Entertainment	.24**	.26**	.07	.15	.10	−.02
Pass Time	.38***	−.08	−.11	.12	.01	−.02
Relaxation	.22***	.06	−.08	.15	.12	.36***
Social Information	.00	.26***	.26***	.12	.05	.05
Gender	−.02	.00	.34***	.41*	.00	−.08
Expertise	.08	.35***	.04	.11	.18*	.14*
R^2	.59	.43	.15	.04	.12	.22
Adjusted R^2	.57	.42	.13	.01	.09	.19
F	51.87***	28.17***	6.57***	1.27	4.94***	10.12***
df	6, 220	6, 221	6, 221	6, 207	6, 220	6, 221

Note: ***$p < .001$, **$p < .01$, *$p < .05$. Table reports standardized Betas.

Information (β = .26, p < .001). The equation accounted for 15.1% of the variance. Motives, gender, and expertise were unable to account for a significant amount of the variance in Work activities.

The fourth research question focused on whether television-related Web motives were linked to accessing various Web sites. Multiple regression identified only limited links among motives and the seven categories of Web sites. Table 4 summarizes the regression results.

Motives, gender, and expertise accounted for 9.0% of the variance in Search Engines. Social Information (β = .17, p < .05), Gender (female, β = .16, p < .05), and expertise (β = .25, p < .001) were significant contributors to the equation. Although there was a significant equation predicting 9.0% of the variance in visiting entertainment Web sites, there were no single, significant predictors. A significant equation predicted 12.6% of the variance in visiting sports Web sites. Gender (male, β = -.30, p < .001) was the only significant predictor. Going to news sites was predicted positively by Entertainment (β = .28, p < .01) and negatively by Pass Time (β = -.23, p < .01) motives and gender (female, β = .15, p < .05). The equation accounted for 10.2% of the variance. Entertainment (β = .21, p < .01), gender (female, β = .16, p < .05), and expertise (β = .17, p < .05) accounted for 8.1% of the variance in going to interactive Web sites. Motives, gender, and expertise were unable to predict visiting Utility or Commerce Web sites.

The fifth research question considered the impact of Web motivation on the amount of Web use. The analysis is summarized in Table 3. Motives had little impact on the amount of Web use. Only expertise (β = .18, p < .05) was a significant contributor to the equation that accounted for 11.9% of the variance in amount of Web use.

The sixth research question focused on how television-related Web motives were

Table 4
Multiple Regression: Predicting Web Sites Visited

	Search Engines	Enter-tainment	Sports	Utilities	News	Interact	Com-merce
Entertainment	−.06	.15	.11	.12	.28**	.21*	.01
Pass Time	.00	.04	−.08	.00	−.26**	−.09	−.02
Relaxation	−.02	.04	.04	−.05	−.04	.01	−.02
Social Information	.17*	.13	.03	.13	.10	.00	.07
Gender	.16*	−.02	−.30***	.17*	.15*	.16*	.18*
Expertise	.25***	−.03	−.02	.03	.09	.17*	.02
R^2	.09	.09	.13	.05	.10	.08	.03
Adjusted R^2	.06	.07	.10	.02	.08	.06	.00
F	3.62**	3.64**	5.32***	1.90	4.21***	3.24**	1.16
df	6, 221	6, 221	6, 221	6, 221	6, 221	6, 221	6, 221

Note: ***p < .001, **p < .01, *p < .05. Table reports standardized Betas.

linked to Web affinity, or feeling that the WWW is important. Once again, multiple regression assessed the multivariate contribution of motives, gender, and expertise. The results are also summarized in Table 3. The equation accounted for 22.0% of the variance. Relaxation (β = .36, p < .001) and gender (female, β = .14, p < .05) were significant predictors of Web affinity.

Web Site Repertoire

This study's last research question considered how some personal characteristics and structural factors related to computer use would be related to Web site repertoire, or the number of different Web sites visited by our respondents. We use two measures of Web site repertoire. We used our measure of the top-100 sites because they represent the most popular sites at the time of the survey. And, we also used the individual sites visits recorded in respondents' Web-use diaries. Multiple regression tested the predictive power of respondent gender, expertise, computer and Internet access, and Web-site sources. The regression results are presented in Table 5.

The equation accounted for only a modest amount of the variance in both measures of Web repertoire. For top-100 site repertoire, only Web use (β = .31, p < .001) and gender (male, β = -.15, p < .05) were significant predictors. For the diary repertoire, the use of external sources (β = .19, p < .01) was the only significant contributor to the equation.

Discussion

This study was conducted to explore whether the WWW is a functional alternative to television. Is the Web like TV? Our answer is a qualified "maybe." This study's most

Table 5
Multiple Regression: Predicting Web Repertoire

	Top-100 Repertoire	Diary Repertoire
Gender	−.15*	.03
Expertise	−.01	.13
Computer at Home	.07	.03
Internet Access at Home	.07	−.02
Web Use	.31***	.11
External Sources	.03	.19**
Internal Sources	.04	.09
R^2	.16	.12
Adjusted R^2	.13	.09
F	4.99***	4.14***
df	7, 183	7, 212

Note: ***p < .001, **p < .01, *p < .05. Table reports standardized Betas.

striking finding is the salience of entertainment as a motive for visiting the World Wide Web. After the school activities required of our student sample, the most frequent use of the Web was for entertainment — playing and browsing various sites. After search engines, the most frequently visited sites on the web were those that offered some kind of entertainment and sports. Like television, the Web is seen as a source of diversion.

This finding is consistent with Stephenson's "play theory" of communication. According to Stephenson (1988), all communication entered into voluntarily is motivated by entertainment and continues only as long as it is pleasurable. As the WWW becomes a regular aspect of the home media environment, the entertainment aspect of the Web should become even stronger. This play component, though, may threaten to displace television viewing. Entertainment is the primary gratification that audiences seek from television (Rubin, 1981a, 1983). If the Web can offer more entertainment, with just as much convenience, it could replace television viewing. Future research should explore the elements of the Web that engage the audience. Studies might consider how interactivity (e.g., Rafaeli, 1988), multimedia, or specialized content contribute to the Web's entertainment experience. It is also important to consider that Web use may be an alternative to other entertaining activities, media-related and non-media related. Future research should consider if Web use displaces other leisure activities.

The Web may also compete with television as a way to pass time. Going on the WWW to fill empty time was our sample's second-most endorsed motive. Most popular conceptions of computers stress how they offer knowledge — a gateway to the "information superhighway." But, it is clear that people also find the computers useful to fill empty time (see also Perse & Dunn, 1998). Television research suggests that watching television to pass time is usually the third-most strongly endorsed reason for watching television and typically associated with higher levels of television viewing as well as television affinity, or feelings that television is important (Rubin 1981a, 1983, 1984). Our study's finding suggests that the Web may not displace television as a way to pass time for two reasons. First, the Pass Time Web surfing motive was only modestly correlated to Web use. This may be a function of our use of a college student sample, who generally have little spare time. Second, the Pass Time Web motive was unrelated to affinity for the WWW. Moreover, watching television to pass time is typically an inattentive use of television (Perse, 1990). So, any audience lost to the WWW to pass time might not be television's most valuable segment of the audience. Future research ought to continue to explore ritualistic television and Web use to explore how the gratifications that the audience receive.

The results of our study suggest that the WWW differs functionally from television viewing. Watching television for relaxation is usually the second-most important reason for watching television (Rubin, 1981a, 1983, 1984). Web surfing, however, does not appear to be a relaxing pastime. The Relaxation motive was not a particularly salient motive for our respondents; it was endorsed significantly less than any other television-related Web surfing motive. And a major use of the WWW for

our sample was acquisition of information and Web materials — activities that are more goal-directed and mindful. While playing computer games and solitaire may offer some rest and relaxation, Web surfing may not. The interactive component of the Web as well as the need to "click" to move around might demand greater attention and involvement from the Web audience. Future research might explore the concept of audience activity (e.g., Levy & Windahl, 1985) on the Web, especially how involvement and alertness are related to Web surfing. It may be that the Web is an inherently active and simulating experience (e.g., Coffey & Stipp, 1997), suited to entertainment and play, but not to rest and relaxation. So, the Web may not be a functional alternative to television viewing for relaxation.

Companionship motive items were not at all salient for our respondents. Television-related companionship statements were rated among the lowest of any of the motive items. There was little evidence that the World Wide Web can substitute for personal interaction. While companionship is not a dominant use of television, there is evidence that television offers a sense of pseudo-interpersonal interaction (e.g., Horton & Wohl, 1956; Rubin et al., 1985). Because video on the Web is still primitive, the WWW may not offer a good deal of social presence, or sense of a person behind the text and graphic messages (e.g., Short, William, & Christie, 1976). The Web as it is now may not be a medium to leave on in the background to offer a sense of "someone else is in the house."

Another striking finding of our study was the comparability of Web-site repertoire to television-channel repertoire. Our respondents reported to have used a maximum of 13 of the top-100 Web sites during the past week, averaging between 4 and 5 Web-site visits. These ranges should be compared to prior findings of television channel repertoires of between 6 and 10 with caution (e.g., Ferguson, 1992; Ferguson & Perse, 1993). First, our survey presented a list of the top-100 sites to the respondents, so this study's repertoire measure is based on aided recall, which typically yields higher repertoire estimates (Ferguson & Perse, 1993). Second, most cable systems offer fewer than 100 channels; the WWW offers hundreds of thousands (if not millions) of different Web sites. Our respondents' diary measure yielded even lower repertoires: between 1 and 2 Web-site visits. These lower estimates may point out the difficulty associated with knowing where one is on the Web. The hyperlinks embedded in various Web pages often direct browsers to different sites, without the awareness of the audience. It is clear that the Web audience is using only a small fraction of the content available.

Limitations

As an exploratory study, our research has several limitations. It is clear that WWW use is motivated by several new motives unique to the medium. Because this study focused on the Web's functional similarity to television, we used television motives that prior research has consistently identified as salient to the audience (Rubin, 1981a, 1983, 1984). The motives identified in this study are probably not an

exhaustive list of the motives driving WWW use. The WWW offers far more diverse types of content than television, such as chat rooms, game playing, financial information and transactions, downloading forms and software, commercial transactions (e.g., shopping, reservations), and health- and education-related information (e.g., Graphics, Visualization, & Utilities Center, 1997; Emerging Technologies Research Group, 1997). New media offer new reasons for use (Rubin & Bantz, 1987). The Web is also interactive and use can be highly selective. On the other hand, bandwidth is still limited and access to some types of Web content can be cumbersome and slow. Future research should uncover the full range of motives that lead to WWW use and explore the motives that drive use of the Web's diverse content

Our measure of repertoire certainly did not uncover the total number of Web sites that our sample visited. By focusing on the top-100 sites, we ignored the more specialized sites that attract small segments of the Web audience. Web sites that deal with specific musical artists, hobbies, or simply the home pages of courses, friends, and family are no doubt visited by college students like those in our sample. But, our methods did not include these sorts of sites in our measure of Web repertoire. We did not expect that those sites are direct functional alternatives to broadcast and cable channels, but future research should check our reasoning. The appeal of specialized content may syphon off segments of the television audience as the Web audience continues to grow.

Our use of a student sample limits the generalizability of our findings. But, our sample was well-suited to measuring the use of WWW. Writers (e.g., Abelman, 1996) have criticized student samples for not being representative of typical media users, but the 18-24 age cohort is more comfortable with computers and Web-surfing that a broader range of respondents would be. For example, college students work and play in a highly-advanced information infrastructure by virtue of living on campus. Computer labs abound and students take advantages of online opportunities. Even commuter students strive for interconnectivity (Tapscott, 1998). College students, though, are typically lighter television viewers than the rest of the population. Moreover, the relatively few mentions of the top-100 Web sites in the diary data also suggest that their Web-use patterns may not be like the general population. While our sample offered a initial look at the Web as a functional alternative to television viewing, future research should consider the question with a more representative, computer-literate and experienced sample.

In conclusion, the results of our study suggest that there are perhaps more similarities between television viewing and Web surfing than differences. The major broadcast and television networks are probably wise to establish Web sites and cross-promote their programming. But many computer users may not want the Web to be like TV. Prior to 1997, services like Pointcast experimented with "push" technology that automatically delivered stock quotes, news, and advertising. By mid-1997, Web browsers like Netscape and Internet Explorer began playing down the "push" technology as individual users balked at the broadcast nature of the channel-based Web pages (Bank, 1997).

Notes

[1] The five affinity items were: I would rather surf the World Wide Web than do anything else, I could easily do without surfing the World Wide Web for several days (recoded for further analysis),I would feel lost without the World Wide Web to surf, Whenever I'm unable to surf the World Wide Web, I really miss it, Surfing the World Wide Web is one of the more important things I do each day.

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