The Impact of Time Constraints on Internet and Web Use

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This study examines the influence of time constraints on Internet and Web search goals and search behavior. Specifically, it looks at the searching behavior of public library Internet users who, previously limited to 30 minutes per Internet session, are given an unlimited amount of time for use. Interviews and observations were conducted with 34 participants searching on their own queries. Despite an increase in the time allowed for searching, most people spent less than 30 minutes on the Internet, carrying out tasks like paying bills, shopping, browsing, and making reservations. Those who took more than 30 minutes were looking for jobs or browsing. E-mail use was universal. In this context, influences like time-dependent and time-independent tasks, use of search hubs to perform more efficient searches, and search diversity were recorded. Though there are a number of large and small studies of Internet and Web use, few of them focus on temporal influences. This study extends knowledge in this area of inquiry.

Introduction

> *"The only reason for time is so that everything doesn't happen at once."*
>
> – Albert Einstein

Time is manifest in many ways. Frequency is represented by the number of occurrences of an event in a specified period of time. Duration is the length of time an event lasts. Time of day refers to the hour, minute, and second in which an event takes place, and intervals refer to the lengths of time between one event and another. All of these manifestations of time are played out everyday on the Internet and in relation to the Internet. The length of time users have to search, the time of day the search takes place, interval(s) between searching, the time users anticipate having for the search, and the time a competing task will take, all affect the way people seek information, evaluate results, and make choices on or about the Internet (Bellman, Lohse, & Johnson, 1999; Bhatnagar, Misra, & Rao, 2000; Brown & Sellen, 2001; Ozmutlu, Spink, & Ozmutlu, 2003; Young & Seggern, 2001).

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Use of the Internet has become widespread in the U.S., particularly in public libraries (Bertot, McClure, & Jaeger, 2005; NTIA, 2002). Given the importance of time and the Internet in our lives, understanding the effect of time on use of the Internet is imperative. Though there are a number of studies of Internet and Web use, few focus on temporal influences. Guided by the research question, "How does time influence Internet and Web use in a public library?" this study used data from observations and interviews to analyze the search goals and behavior of public library Internet users who, previously limited to 30 minutes per Internet session, are given an unlimited time for use. Interviews and observations were conducted with 34 participants searching on their own queries.

Literature Review

Research about the purpose(s) of Internet use, and studies examining temporal influences on human behavior provide the background for the current study.

Purposes of Internet Use

Before one can explore the influence of time on Internet/Web use, one must first place Internet searching in context. Here, goals for utilizing the Internet provide the background for understanding temporal influences on the interaction between humans and an information source.

Whether the purpose is to use e-mail to stay in touch with a friend or to find a job, goals drive Internet activity (Brown, Sellen, & O'Hara, 2000). McConnaughey, Everette, Reynolds, and Lader (1999), who conducted a nationwide study of Internet use in the U.S., found that the most popular reasons for Internet use outside the home was e-mail, information searches, job-related tasks, taking a course, and job searching. Based in part on this finding, the authors concluded that people use the Internet to improve their current status (i.e., unemployed people want to find a job, sick people want to get well, etc). The tying of goals to one's physical location when using the Internet was also seen by Rieh (2004), who concluded that when at home, users tend to explore or browse more than they do at school or at the library.

Like McConnaughey et al. (1999), Hoffman, Novak, and Venkatesh (2004) reported that e-mail is the most popular Internet activity. Their goal was to determine whether the Internet had become indispensable. E-mail use was followed by games and hobbies, news and information, travel and vacation planning, online shopping, and health information seeking.

One study reports the growing popularity of e-commerce and the waning popularity of education and entertainment (Jansen & Spink, 2006). When they buy on the Web, people address love and affiliation needs more so than other needs like safety and prestige (Leonard, 2003). The top five types of items bought on the Web were books, airline tickets, CDs, clothing, and software. "Airline tickets/reservations, books/magazines, and CDs satisfy love and affiliation needs because they apply to the consumer's need to belong" (Leonard, 2003, Results section, ¶ 5).

Two studies found that temporal priorities are set when educational goals are involved. Slone (2002), for instance, found that people take more time for educational purposes than they do for looking up friends and relatives. D'Esposito and Gardner (1999) concluded that when the goal is education, students set aside more time for searching than for shopping, entertainment, and other tasks.

Temporal Influences on Human Behavior

The study of time and human behavior brings together scholars in sociology, psychology, economics, health, transportation, and a host of other disciplines. Despite differences in perspective, most will agree that time has multiple meanings, dimensions, and influences. This section will explore concepts about time, including time allocation, time pressure and time constraints, and information foraging.

Time allocation. The economic theory of time allocation refers to the divvying up of time in households between work tasks and nonwork tasks based on the monetary cost of the task and the time it takes to complete it (Becker, 1965). Within a given society, the household, in the natural way of things, determines individual behavior in relation to time. People choose between home-related activities or goods, work-related activities or goods, and leisure or discretionary activities or goods based on the perceived length of time involved in the activity, benefit to the household of carrying out the activity, and resources the activity will require (Kooreman & Kapteyn, 1987; Solberg & Wong, 1992). Households may vary the allocation of activities under tight time and budget constraints (Kockelman, 2001). Daily activities outside the home are often done independently, but decisions are made at the household level such that each member maximizes his/her utility (Zhang, Timmermans, & Borgers, 2004).

Haythornthwaite (2001) considered the effects of Internet use on household allocation of time and concluded that time in one's schedule must be redistributed to accommodate Internet use. A person, for instance, may "negotiate" the benefits of using the Internet at the library to buy concert tickets versus, say, calling to get the tickets. Based on the theory of time allocation, time spent on Internet use must be taken from other activities (Nie & Erbring, 2002; Kraut, Patterson, Lundmark, Kiesler, Mukopadhyay, & Scherlis, 1998).

Time pressure and time constraints. Time-saving benefits, time constraints, and time pressure often dictate human behavior for better or worse. Fidel and Green (2004) found that the prospect of saving time was instrumental in people's selection of informational sources. In general, however, people alter their decision strategies due to time constraints or time pressures. They may examine information more quickly than normal (Ben Zur & Breznitz 1981), make increasingly poor decisions relative to the increase in time pressure (Hahn, Lawson, & Lee, 1992), utilize strategies that require less effort than more useful strategies (Payne, Bettman, & Johnson, 1988), or use fewer sources altogether (Julien & Michels, 2004). Bruce (2005) found that in making decisions about information in their personal collection, a person will accept or decline an item based on the investment of time and effort; most sources chosen in haste were not useful.

As for the Web, if there is no time pressure, people make choices based on their natural preferences (Amichai-Hamburger, 2002). In the interests of time, however, people segment Internet tasks into school-related, recreational, and other tasks (D'Esposito & Gardner, 1999); purchase items on the Web rather than go shopping in real-time (Bhatnagar, Misra, & Rao, 2000; Keeney, 1999); use e-mail and discussion groups rather than communicate by mail or phone (Savolainen, 1999); shop on the Web rather than by other means (Bellman, Lohse, & Johnson, 1999); and choose familiar sources over unfamiliar ones, despite the benefits of accessing the unfamiliar ones (Savolainen & Kari, 2004).

Information foraging. Information foraging theory predicts searching behavior by determining the proportion of relevant documents in a set divided by the time it will take to read all the documents in the set—a balancing act between value and cost (Pirolli & Card, 1995). Cost is measured in time. The theory of information foraging likens human behavior to animal behavior. In the wild, animals sniff out the quickest and easiest path to food. On the Web, users predict the cost of following a given path and the value of the information pursued. Pirolli and Card (1999) refer to this prediction of easy prey as "information scent." The hunter-gatherer foraging analogy is used in a study of scholars who, limited by time, use a mix of searching and monitoring tasks because this is considered to be the optimal route to the desired information (Sandstrom, 1994).

Methodology

Procedures

The study took place at the South Fulton Regional Library, a branch of the Atlanta-Fulton (GA) Library system. It was conducted over a period of two weeks in February

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2004. Test days were Monday through Thursday from 2 p.m. to 6 p.m. To recruit participants, members of the four-person research team stood at the main doors of the library and approached all visitors. Investigators gave a short introduction, asked each person if they were over 18 and if they would be using the Internet during their visit. If the answer to both questions was "yes," visitors were asked to take part in the study. Upon consenting, participants were led to a computer reserved for the study and told they had as much time as they needed to do their searches. Under normal circumstances, library users were limited to 30 minutes. Time limits were lifted for people participating in the study. When necessary, investigators made rounds throughout the library seeking potential participants who might have been missed at the doors.

Data Collection

Observations and interviews were used to collect data. Observations began when each participant sat down at the computer and ended at the request of the participant. Investigators hand-recorded observation notes on a log sheet (see Appendix A). They provided no assistance or introduction, recorded only what participants did on their own, and did not change the computer interface between participants. Only one participant was observed at a time. Each participant was observed by two members of the research team; one recorded user behaviors, comments, and time spent, while the other was assigned only to record Web pages (with distinct URLs) visited for each participant. When the participant was moving too fast, which happened on six occasions, the observers asked the participant to repeat a step. The average time for observations was 26 minutes. The shortest was 4 minutes, while the longest was 1 hour and 24 minutes. The median length of an observation session was 25 minutes.

Following observation, an audio taped interview (Appendix B) was conducted with each participant. An interview guide was used for this purpose. This unstructured approach allowed for answers and follow-up questions specific to each participant. The average time for interviews was 10 minutes. The shortest was 6 minutes, while the longest was 18 minutes. The median length of an interview session was 9 minutes.

Sampling Results

The goal of sampling was to recruit adult Internet users. A total of 413 adults were approached during the hours of the study. Of this number, 81 (20%) said they would be using the Internet during their visit. Of these, 42 declined to participate. The data from eight participants were not used because four did not complete the interviews; one person could not complete the session because the browser crashed when he searched on several terms that had been filtered out; another participant could not complete the observations because of time constraints (there was a person ahead of her who was in the middle of a session); and two changed their minds about participating after observations. Thirty-four (42%) of those asked to participate completed the study. Sixteen were female and eighteen were male.

Limitations

Several limitations are inherent in the methods and procedures used in this inquiry. First, the study is limited to a small group of users in one library, so results cannot be generalized to people, times, and situations dissimilar to this. During the interviews, participants might have given responses they thought were "correct" rather than true. The open-ended nature of the interviews served to minimize this factor as participants were asked the same questions in different ways. Observations also served as checks on participant responses.

Additionally, potential participants might have been missed during the study hours, but the effect of this should have been lessened by investigators' practice of making rounds in the library to seek out visitors who might have been missed at the doors. On six occasions, searching was interrupted when members of the research team asked participants to repeat a step. This usually happened when a URL the participant visited was missed by the observer. Nonetheless, there is still the possibility that some URLs were missed.

Finally, open-ended interview questions were designed to solicit answers from users based on their individual interpretation of their own situation or context; so, responses to some questions are not directly comparable from one user to the next.

Initial Data Analysis and Coding

Though data about frequency and time of day were collected for each participant, the analysis focused primarily on issues related to duration and, to a lesser degree, intervals between time spent at home, the library, and school. Following data collection, taped interviews were transcribed, and observation notes, memos, supplemental notes, and summary sheets were collated for each participant. The data resulted in a number of groupings. As stated earlier, users typically are limited to 30 minutes on the Internet. When they discovered that the time limit was lifted, some people spent more than 30 minutes. To determine the influence of the 30 minute rule, these users were separated from others who stayed within the previously set time limits. Beyond this, there was an interest in people who spent a very short time on the Internet. Coding groups A, B, C, and D were developed based on these interests and convenient divisions of time.

Participants who used the Internet for less than 16 minutes were placed in group A, those who used the Internet for 16 to 25 minutes were placed in group B, those who used the Internet for 26 to 30 minutes were placed in group C, and those who used the Internet for longer than 30 minutes were placed in group D.

Within these groups, users were coded based on search goals, which formed four categories. Participants who used

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TABLE 1. Sample interview responses to question 5.

Sample interview responses	Categories observed
"I want to find work at home using my computer."	Jobs
"I'm going on there to pay Verizon. 'Cause I'm a little late with my cell phone payment."	Sign-up / Pay bills
"To check Teach Georgia and check my email."	Jobs; E-mail
"I want to sign up to take the SAT."	Sign-up / Pay bills
"I need to check my e-mail and use the AJC to find a job."	Jobs; E-mail
"My purpose for searching was to order a pair of shoes today. I was at work . . . and, well, I didn't want to do it at work. I come here very often."	Sign-up / Pay bills
"To go online . . . look up sports information . . . basketball scores."	Search / Browse
"I'm looking for information."	Search / Browse; Jobs

forms (other than a search form) to enter data were placed in a category called *sign-up/pay bills*, while those who used search forms or linking (outside of the form entry process) were considered to be *searching or browsing*. Participants who were looking for a job or information about a job were placed in the category *jobs*. *E-mail* was the final goal category. Goals were determined using results from both the interviews and observations. Table 1 displays sample participant responses to Question 5 on the interview guide. A full list of responses appears in Appendix C.

Addressing goals, Question 5 asks, "What is your purpose for using the computer today?" Users sometimes gave one response, but in their Internet session might have carried out a search corresponding to different or additional goals. For instance, in response to Question 5, one participant, simply said, "I'm looking for information." During their session, however, observers noted searching, browsing, and job seeking. Some participants had more than one goal. Subsequent analysis consisted of comparing and contrasting patterns using a Spectrum representation, discussed in the next section.

Analysis and Results

Analysis and results are presented here in two sections. The first, Goals and Time, describes Internet search goals in relation to search duration. The second, Time in Context, looks at responses to the following question: "If you had known before coming to the library that you had more time to use the Internet, would you have done anything differently? If so, what would you have done?"

Goals and Time

All the participants used the Internet regularly at the library, so they were aware of the usual thirty-minute time limit for Internet use. With the time limit relaxed, they checked e-mail, paid bills, made reservations, went job-hunting, searched, and browsed. Figure 1 is a Spectrum representation of these goals in relation to search duration. A discussion of behavior within these groups follows.

Sign-up/Pay Bills

Figure 2 depicts, in miniature, the sign-up/pay bills pattern from Figure 1. More people in the sign-up/pay bills group are in the first two groups of the Spectrum (shorter searches) than are in the last two (longer searches). Users kept to their original plan; they did not explore or conduct unplanned searches. They made travel reservations, bought shoes, signed up for a diet plan, paid bills, did prescreening

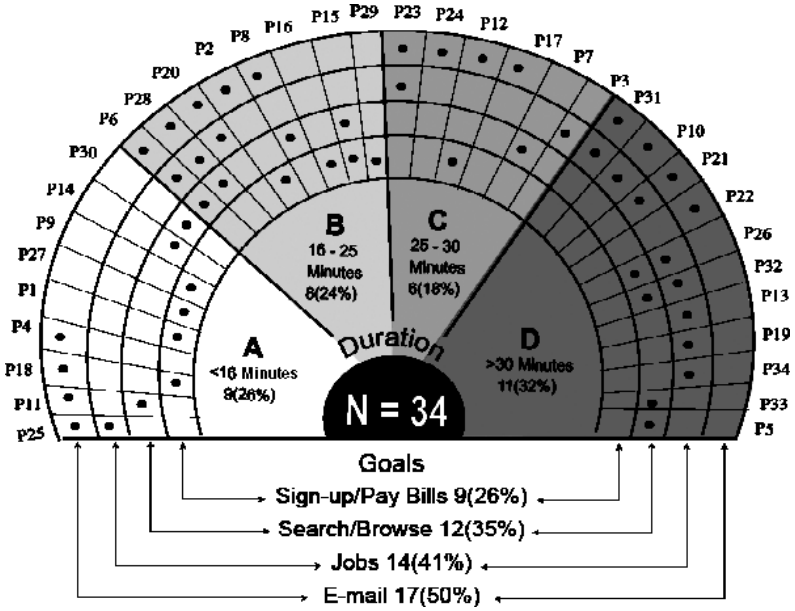

FIG. 1. Spectrum representation of user goals in relation to search duration. P(£) is the number assigned to each participant. Search goals are represented by bullets and arranged according to similarities in goals and duration.

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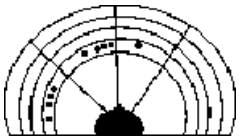

FIG. 2. Representation of *sign-up/pay bills* pattern.

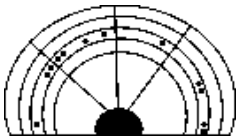

FIG. 3. Representation of *search/browse* pattern.

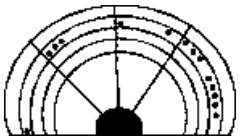

FIG. 4. Representation of *jobs* pattern.

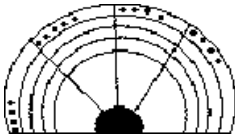

FIG. 5. Representation of *e-mail* pattern.

for university admissions, subscribed to an online newspaper, and signed up to take an exam. They accessed an average of 4.0 Web pages.

Searching and Browsing

The pattern for searching and browsing was more evenly distributed than the sign-up/pay bills category. That is, about as many people conducted longer searches as conducted shorter ones. Figure 3 shows the searching/browsing pattern in miniature. Participants in this group fell into two subgroups distinguished by their response to the extra time for the search. One group sought specific information from familiar sites. They typed in the URL and recorded or memorized the desired information. They did not explore. When their problem was solved, they exited the browser. They accessed an average of 4.3 Web pages.

When told about the extended time, participants in the second group changed their intended search. Some conducted searches for information they'd wanted to seek before but lacked the time. Some visited only familiar sites. Others browsed with no particular goal, visiting numerous sites familiar and unfamiliar. As a group, they visited an average of 10.6 pages.

Jobs

Most people looking for job information spent more than 30 minutes searching. They all began with a search engine they accessed via URLs—either Yahoo, Google, or MSN. They searched sites with which they were familiar and used e-mail in relation to the search. Most spent more than thirty minutes searching and used notepads, notes, or electronic devices to "remember" their passwords or login information. Figure 4 shows that the jobs pattern is weighted to the right (longer searches).

A subgroup of users in this category found a desired site, via a URL, and searched only within that site for a job. One searched Home Depot, while another searched TeachGeorgia, a site for educators looking for teaching jobs in Georgia. The other two searched specific companies within the *Atlanta Journal Constitution's* database of advertised employers. E-mail use was geared only to job-related communication. They accessed an average of 3.8 pages.

Conversely, the second subgroup navigated more widely and accessed more Web pages. Most went back and forth between employer sites and informational sites, employer sites and their resume, employer sites and Mapquest, or different employer sites. They used a number of different job sites, including Yahoo, Hotjobs, Monster.com, and the *Atlanta Journal Constitution*. They accessed an average of 5.9 Web pages.

E-mail

As shown in Figure 5, e-mail use was evenly distributed throughout the four groups of the Spectrum. Most of the users in this group visited the library regularly just to check e-mail; they used URLs to go directly to either Yahoo Mail or Hotmail.

After checking their e-mail, one subgroup of e-mail users took the extra time to visit sites of interest, most of which were familiar. They exited the domain of their e-mail host and ventured to other sites. They accessed an average of 5.8 pages. In contrast, a second group, consisting of seven people, used their e-mail host as a hub from which they could access other sites. Any site they accessed was reached through an e-mail link. One user visited a friend's Web page from an e-mail link. Another opened and read all of her Yahoo e-mail, including 26 spam messages. Users in this subgroup visited an average of 8.5 pages.

Time in Context

To provide additional context to the Goals and Time analysis, this section explores Question 8 on the interview guide, which asks, "If you had known before coming to the library that you had more time to use the Internet, would you have done anything differently? If so, what would you have done?" In response to the first part of Question 8, 11 people responded in the affirmative that they would have searched differently if they had known earlier about the extra time, 7 people responded with "probably" or weren't sure, and 16 responded in the negative to this question.

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People who said "yes" in response to Question 8 said they would have searched for a job, searched EBAY for a wedding dress, sought information on how to fix a home computer, conducted school-related work, and sent e-mail to family and friends if they had known earlier about the extra time. One person said she didn't give herself enough time to look for new information on this visit. Others had similar responses.

The participants who responded with "probably" said they might have "looked for a job" and "looked for more stuff," contacted friends, reviewed a friend's or relative's Web page, or just had "fun." Some considered "maybe" or "maybe not" conducting school work.

Seven people who responded in the negative to Question 8 cited work-related time constraints. All seven came to the library during a break from work or immediately after work. Their time was limited, so they planned their trip to coincide with a set number of minutes. Other people cited privacy concerns at work as a reason for using the library's computer to check e-mail. One with both concerns said, "I don't have a computer at home, so the library is the only place I can check my e-mail. So, I just slip in here after work . . . you know I can't do this at work because people can get all in your business . . . so I just come in here, check my e-mail, and go and pick up my daughter from school."

Five people who responded in the negative to Question 8 nevertheless took the extra time allotted for the search. One person originally said she wanted to make travel reservations, but when she found she had additional time, she switched to seeking information about Mae Jemison. When asked why she made this switch, she said, "Oh, I can make reservations any time . . . but I don't usually get to search as long as I want here, so I figured I should take advantage of it."

The majority of users who responded in the negative indicated that they use the Internet differently in the library than at home or work. Most indicated that no matter how much extra time they were given, they'd only use the Internet for a set purpose. Some responses were as follows: "I have the Internet at work and home . . . I only use the library Internet for certain things. If I need extra time, I do the Internet at home." "It doesn't matter. I use the library for e-mail. That's it. I don't get that much e-mail." "My computer broke down once for about two weeks, and I came to the library and used the Internet. Every time I got on, I was off in fifteen minutes. I thought I would use it longer, but I didn't." "You can't do the same things in the library as home." "I didn't think too much about the new time. I mean, I was glad I had it, but I didn't need it."

Discussion

The question, "How does time influence Internet and Web use in a public library?" is addressed here in several subsections.

Time Dependency/Independency

Of the goals discussed here, the sign-up/pay bills category is weighted to the left side of the Spectrum (shorter searches), and the job-seeking pattern is weighted to the right side (longer searches). The patterns indicate that the less time one has for Internet use the more likely s/he is to pay a bill than to search for a job. Conversely, the more time one has, the more likely one is to search for a job. Given these scenarios, one can say that both the sign-up/pay bills and job-seeking categories are time dependent. The patterns for searching/browsing and e-mail, on the other hand, are more evenly distributed across the four groups of the Spectrum, indicating that searching/browsing and use of e-mail are less dependent on time than paying bills or job hunting. In other words, checking e-mail and browsing are tasks performed at public libraries, whether users have a little time or a lot of time. As to e-mail, this finding supports McConnaughey, Everette, Reynolds, and Lader's (1999) contention that e-mail is a universal tool.

Hubs

E-mail users and job seekers appeared to be using their e-mail host, a search engine, or a job source as a "hub" (center of activity) from which they access everything else. A number of e-mail users typed the URL of their e-mail host site, began there, came back numerous times, linked only from there, and ended there.

Other job-seekers searched only within a particular site. The activities of those who used the likes of Hotjobs and Monster as hubs and those who used a potential employer or industry site as a hub suggest that people choose as the hub the site(s) most likely to return the quickest and most appropriate results for the least amount of effort. This behavior can be categorized as information foraging behavior in which users "sniff out" the quickest and easiest path to the information (Pirolli & Card, 1999).

Furthermore, the act of combing through numerous prospects using one type of hub and collecting data using another type highlights the difference between people who might be at the beginning of information seeking and those who are further along, respectively. This observation calls for further research in this area.

Search Diversity

People who took the extra time to search conducted diverse searches; they combined, for instance, job searching with school work. This appears to contradict a finding by Rieh (2004) that users have more diverse search goals when at home than elsewhere. Upon closer review, however, the difference appears to stem as much from the amount of time available as from the location where the search is being done. The findings indicate users had more time to search at home than in the library. The results further suggest that there would be more educational searching, more recreational searching, and more searches for friends and family if libraries were to relax their time limitations on Internet searching.

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For people who did not use the extra time to search, there appeared to be disappointment that they had not known about the extra time rather than frustration that there was not enough time. An indication of this is the lack of behaviors that come with time pressures, such as examining information too quickly (Ben Zur & Breznitz 1981); or making poor decisions (Hahn, Lawson, & Lee, 1992). This is true despite the fact that some users had their own self-imposed time constraints. The preparation people had in anticipation of running out of time is not to be ignored.

Situational Influences and Compartmentalization

One wonders why more users did not take advantage of the extended time for Internet use. To explore this issue, situational influences and compartmentalization are considered. Some people did not use the extended time because additional time on the Internet would have situational impacts at home, work, or school.

Searches that were perceived to be more time consuming were rarely done off the schedule. Searching for educational purposes tends to take more time than other tasks like finding friends and relatives (Slone, 2002), so people set aside the extra time needed for this type of search (D'Esposito & Gardner, 1999). This behavior relates to time allocation influences where users might weigh whether searching for certain things on the Internet in the library is the best use of their time (Zhang, Timmermans, & Borgers, 2004; Solberg & Wong, 1992; Kooreman & Kapteyn 1987). This might explain why people who could not take the extra time did not search for education purposes, but it does not explain why searches for friends and relatives were unpopular.

McConnaughey et al. (1999) report that Americans have different purposes for Internet use when they are at home than when they are elsewhere. An argument that might explain the paucity of searches related to both education and finding friends and relatives is that some people compartmentalize their searching into categories: searches done in the public library, searches done at home, and searches done at school. This could explain why most people said they would not have searched differently if they had known about the extra time. Perhaps they see tasks like shopping, checking e-mail, and looking for jobs as "library" tasks, while doing research and finding relatives are not. This is further supported by users' statements that only "certain things" should be done at the public library. There is not enough research to determine whether this notion stems from time constraints now common in public libraries.

Conclusion

The Internet is a large part of our lives; it has become a medium by which vast amounts of information is shared and processed. Time is universal. Yet the role time plays in use of the Internet has received scant attention. This research extends our knowledge of the impact of temporal influences on Internet use in a public library. It provides a unique look at the concept of time in light of key factors like search diversity, use of hub sites, compartmentalization, and time dependency and independency.

Future Research

The procedures and questions in this study do not provide adequate information to make a credible determination of whether participants would or would not have searched differently had they known beforehand about the extension of time. Such a study might require two groups of users, one which knows all along they have an unlimited time for searching and one which is only made aware of the additional time when they are at the computer.

A larger study might also be able to determine the temporal reasons for use of some types of searches and not others, the information needs that could or could not be addressed due to time limitations, and the temporal influences on decisions to use or not use the Internet at the public library.

Another area that bears further exploration is the notion of world community and the Internet. In other words, is the Internet eroding our relationship to time (i.e., one can check e-mail, buy products, or communicate with someone in other parts of the world at any time), thereby creating a world community rather than a local one. A related conundrum is that since so many people use the public library in their communities for the Internet, how, then, can this erode a sense of community. Will we eventually relate to people differently in real time because of Internet use?

Implications for Librarians and Web Designers

For many, the Internet at the public library is an integral part of everyday life. Public librarians have found numerous ways to balance the needs of individual patrons with fairness to all citizens. Time limitations are perhaps the biggest example of this balancing act. It is useful, however, to be aware of the impact of time limitations.

The findings suggest that with more time (longer than 30 minutes), users perform more diverse searches; they explore more and perform more searches related to education. With limitations, people rarely go beyond shopping, filling in forms, and cursory e-mail checks. It is up to librarians to find a way to use this knowledge to help their patrons. One way to do this is to conduct an assessment of Internet use and nonuse to determine whether it is more beneficial to increase or decrease time limits, or to maintain current policies. Librarians in academic settings might also benefit from the knowledge that the range of search types increases with the increase in time.

Hub use and compartmentalization of Internet tasks into "library" and "nonlibrary" tasks might also have implications for librarians and Web designers. Both behaviors point to a means by which links, pages, and menus can be organized to gain the greatest benefit from hub use. Computers at the library with Internet access, for example, might incorporate major hub sites (i.e., Google, Yahoo Mail, MSN) without

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taking the focus away from the library's main page. A better solution, however, is for the library Web site to become a hub of its own, providing people with the means to easily navigate between the library's search site and e-mail, job sites, community information, and back to e-mail.

To address compartmentalization, libraries may, again, want to assess Internet needs to determine if this behavior has to do with time limitations or some other influence. If it has to do with time, the suggestion as to search diversity would apply. That is, the search will tend to be less diverse for each user. Otherwise, groupings of links or menus that keep information deemed not appropriate for searching in the library to a minimum may be of help to a segment of users.

Our belief in the concept of time shapes the way we conduct our lives. A sequence is spent at home, another at work, and another doing other things. We adjust our behavior so that one sequence does not collide with another. That is the importance of time in our daily lives.

> *Events in our lives happen in a sequence in time, but in their significance to ourselves they find their own order . . . the continuous thread of revelation.*
>
> – Eudora Welty

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Appendix A

Log Sheet

A log with the following headings was used to record information on each participant in the study.
DATE: _____ TIME: (begin) _____ (end) _____ PARTICIPANT £ _____

Appendix B

Interview Guide

DATE: _____ TIME: (begin) _____ (end) _____ PARTICIPANT £ _____
GENDER _____

1. Did you find what you were looking for?
2. Did you visit only known sites today?
3. How long have you worked on this problem or question?
4. For what purpose will you use this information?
5. What is your purpose for using the computer today?
6. What type of results are you seeking (i.e., e-mail, snippet or factoid, full-text, music, pictures, etc.)?
7. Have you searched for this information on the Internet before?
8. If you had known before coming to the library that you had more time to use the Internet, would you have done anything differently? If so, what would you have done?
9. How often do you use the Internet? I use the Internet . . .

_____ once a week or less
_____ more than once a week, but less than four times per week
_____ four to six times per week
_____ once a day
_____ twice a day
_____ more than twice a day

Appendix C

Participant responses to question 5 on the interview guide.

P#	Responses	Observed
1	"To make reservations."	Sign-up/Pay bills
2	"My purpose . . . Umm. I don't know why. Easy access to my accounts that I need to check and uh, e-mail."	Sign-up/Pay bills; E-mail
3	"I want to find work at home using my computer."	Jobs
4	"Check e-mail."	E-mail
5	"I wanted to use the Web to look for information for my daughter about Mae Jemison . . . [my daughter is] in second grade."	Search/Browse
6	"I need to check my e-mail."	Search/Browse; Jobs; E-mail
7	"To search Internet for school."	Search/Browse
8	"I gotta e-mail a friend of mine."	Search/Browse; E-mail
9	"I'm going on there to pay Verizon. 'Cause I'm a little late with my cell phone payment."	Sign-up/Pay bills
10	"To check Teach Georgia and check my e-mail."	Jobs; E-mail
11	"First, I was gonna check my e-mail on Yahoo. Then, I was gonna see what was up on the different Websites."	Search/Browse; E-mail
12	"I have to check my e-mail."	Sign-up/Pay bills; E-mail
13	"To find a job."	Jobs

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Participant responses to question 5 on the interview guide. (*Continued*)

P#	Responses	Observed
14	" . . . to find something about Shirley Chisholm."	Search/Browse
15	"I want to read news and info about world affairs."	Sign-up/Pay bills; Search/Browse
16	"I want to sign up to take the SAT."	Sign-up/Pay bills
17	" . . . personal business."	E-mail
18	"I need to check my e-mail and make reservations . . . to get a car."	Sign-up/Pay bills; E-mail
19	"I'm looking for a job."	Jobs
20	"I'm gonna check my e-mail and find a job."	Jobs; E-mail
21	"I came to check my e-mail and work on my resume online, and check to see if anybody wrote me back, and find a wedding dress."	Jobs; E-mail
22	"I have to do my e-mail."	E-mail
23	"I need to check my e-mail and use the AJC to find a job."	Jobs; E-mail
24	"I need to look for some information."	E-mail
25	"Mostly e-mail"	Jobs; E-mail
26	"I want to research a college so I can do research overseas."	Search/Browse; Jobs
27	"I was just coming to pay my bills."	Sign-up/Pay bills
28	"My purpose today to use the computer/Internet is to check my e-mail, and research some jobs as well as low-carb diets—some more information on that."	Search/Browse; Jobs; E-mail
29	"My purpose for searching was to order a pair of shoes today. I was at work . . . and, well, I didn't want to do it at work. I come here very often."	Sign-up/Pay bills
30	"To go online . . . look up sports information . . . basketball scores."	Search/Browse
31	". . . need an address and test information, and e-mail."	Jobs; E-mail
32	"I'm looking for information."	Search/Browse; Jobs
33	"You know, scholarship, college stuff . . . financial aid . . . scholarships."	Search/Browse
34	"I'm looking for a job in another state."	Jobs

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