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This paper focuses on the use of AOL Instant Messenger as a chat reference system in college and undergraduate libraries. A study investigating the advantages and disadvantages of AOL Instant Messenger as a chat reference system in libraries whose primary patrons are college undergraduates was performed. This study examines AOL Instant Messenger from the perspective of the college library patrons, namely undergraduates. The usability and responsiveness of AOL Instant Messenger in a chat reference role was analyzed through thirteen think aloud interviews. Participants in the think aloud interviews asked research questions using Davis Library's Live Online Help and R.B. House Undergraduate Library's IM a Librarian services. The study finds that undergraduates prefer AOL Instant Messenger, primarily because they are familiar with the system and can easily multitask while using it.

Headings:

College and university libraries—Reference service

Electronic reference services

Reference services—Automation

Reference services—North Carolina

THE ADVANTAGES AND DISADVANTAGES OF AOL INSTANT MESSENGER AS A CHAT REFERENCE SYSTEM

by
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Introduction

Everyday, people in the office and at school are instant messaging to communicate with their peers. Use of the technology, which allows for synchronous, virtual communication, has been steadily rising over the past five years. (Madden 2003) Instant Messaging, also known as online chat, represents the most impressive online revolution since the advent of email. By far, the most widely used online chat system is AOL Instant Messenger. According to PC Magazine, AOL Instant Messenger had over 200 million registered users as of November 2003. (Metz, Clyman, and Todd 2003) Due to its popularity in the social realm, businesses and even libraries are taking advantage of online chatting. As systems librarian Marshall Breeding (2003) notes, "instant messaging will be ignored only by organizations willing to risk irrelevancy."

It has taken several years for online chat to obtain such popularity. The first instant messaging system was called Zephyr and started in 1989. (Rapp 2002) In the meantime, America Online (then known as Quantum Computer Services) also introduced an instant messaging system. When Quantum changed its name to America Online in1992, it still offered the service to subscribers. AOL decided to release a free version of its instant messaging system to non-subscribers in 1997. At that point, it became popular as an informal method of communication, mostly for teenagers and college students. Over the past few years, however, instant messaging has become routine for people in all age groups and environments. People chat online at work, at home, and even over their cellular phones. The vast majority of these people use AOL Instant

Messenger, although other systems like Yahoo! and MSN are available. (Metz, Clyman, and Todd 2003)

Online chat has also started a revolution in academic libraries. Not too long after the technology became a standard for casual communication, academic libraries introduced it as a new way to perform virtual reference. Broughton (2002) defines chat reference as "synchronous digital reference (text-based and in real time.)" From its introduction, chat reference has been extremely popular among academic library patrons. The first chat reference service was actually not affiliated with a university. In 1999, WebHelp, a live, online help service was staffed by hundred of "WebWizards" who answered reference questions. (Coffman 2004) In the same year, North Carolina State University used the ICQ system to introduce one of the first academic chat reference services. (Broughton 2002)

Today some reference desks are receiving more online chat requests for help than in-person ones. Janes (2003) asked 162 virtual reference services to add up the number of questions they received for three days in November. The total questions asked over chat reference for the three days were 5,657. Conversely, traditional reference desk services are experiencing declining numbers of requests. Coffman (2004) claims, "Between 1997 and 2003, median ARL reference statistics dropped from a 1997 peak of 162,336 to a 2003 low of 96,228 — a loss of over 40 percent in the span of 6 years." There are several explanations for the service's popularity on campuses. College students value the anonymity and convenience that chat reference provides them. (Foley 2002) Having grown up with search engines, most college students are accustomed to finding answers

instantly. Chat reference allows students to make a speedy remote connection with a librarian instead of waiting for a reply by email.

During the early years of chat reference, academic librarians explored the best ways to serve patrons using the service. Virtual Reference Desk began making guidelines for customer service in 1997. Many academic libraries tried to comply with Virtual Reference Desk's *Facets of Quality for Digital Reference Services*, a guide developed by an expert panel of librarians. This publication creates standards for user transactions and service development and management in digital reference. Patterson (2001) and Broughton (2002) examined the types of questions that are asked during chat reference sessions. Fagan and Desai (2001) looked traditional and online reference interviews and found differences in the formality of patrons' language.

Librarians are not only concerned with service issues in chat reference; there have been many discussions about choosing and implementing the best system. Most librarians base their decision for a chat reference system on two factors. (Boruff-Jones (2001; Boyer 2001; Broughton 2001) Cost, always an issue for academic libraries, has become especially important over the last few years. Budget cuts and the high prices of electronic resources force librarians to examine the costs of chat reference systems closely. The second factor for most librarians has been the features – often referred to as the "bells and whistles"—of the system. The most important features are the ability to push web pages, manage multiple chat sessions, and co-browse databases with patrons.

Clearly, cost and features are important factors to consider when choosing a system. However, librarians need to ask themselves certain questions before they decide on a system. Do highly technical and detailed features make one chat reference superior

to another? Will your staff actually use all of the bells and whistles that a system offers? Will your patrons ask questions that will require the use of all the bells & whistles? Is the system worth what it will cost your institution? Most importantly, will your patrons feel comfortable using the system?

Although librarians have done several studies on patron satisfaction with the service aspect of chat reference, the system itself has been largely ignored. According to Maxwell (2002) virtual reference needs to become standardized before it takes its next step in development. This paper is motivated by the author's belief that the next development should be examining the advantages and disadvantages of chat reference systems. In terms of evaluating satisfaction with a system, librarians need to analyze various issues. Usability is the most obvious issue. Can patrons navigate the system with ease? Are they familiar with the interface? If the interface is not familiar, is it easy to learn?

Some academic libraries need chat reference systems with many extra features. For example, large research institutions that serve thousands of faculty members and students might need all of functions an expensive system offers, like the ability to collect detailed usage and patron affiliation statistics and send automated messages to patrons waiting in a queue. However, many other libraries may not require an expensive, complicated chat reference system. The results of this study show that specifically undergraduate libraries could consider other options for chat reference.

The purpose of this study is to investigate the advantages and disadvantages of AOL Instant Messenger as a chat reference system in libraries whose primary patrons are college undergraduates. Institutions of this nature include small college libraries and

undergraduate libraries at larger universities. This study examines AOL Instant Messenger from the perspective of the college library patrons, namely undergraduates. The usability and responsiveness of AOL Instant Messenger in a chat reference role are examined closely. In the end, a value judgment about the use of AOL Instant Messenger in the undergraduate library setting is made. This study will contribute to the rapidly expanding literature on chat reference by analyzing an underrepresented aspect of the field, namely usability studies of chat reference systems.

Literature Review

Introduction

Chat reference has been widely discussed by librarians since it first appeared in the late 1990's. However, a review of the literature shows that there is a need for qualitative studies of the usability of chat reference systems. Therefore, this review of the literature includes a discussion of the history of implementing chat reference in academic libraries; the communication and etiquette issues; the usage and standards of evaluation; instant messaging in the library; the use of instant messaging by college students and teenagers; and the application of the think-aloud methodology for qualitative research.

History of Implementing Chat Reference in Academic Libraries

Until recently, chat reference was considered a new technology in academic libraries. In the late 1990's, early adopters of the technology discussed their experiences with implementing a chat reference system. Nearly all of these articles are case studies of institutions testing the service. Nevertheless, librarians unearthed many important issues in chat reference simply by describing their experiences with the technology.

A lot of the early literature focuses on the difficulties of establishing and maintaining a chat reference system in the early years of the technology. For example, librarians at the Indiana University Purdue University Indianapolis (IUPUI) Library describe a particularly arduous experience when choosing a system. They initially purchased one chat reference system but then had to switch to a different system after a year. Boruff-Jones (2001) compares and contrasts the cost, features, customer support,

and customization of the two systems tried at IUPUI. The reasons for dropping the old system were its price, lack of technical support, requirement for special training, and technology issues. She explains that first system offers features like a "meeting mode" and the ability to push documents and slide shows. However, she notes, "many of the special features, although initially attractive, were not particularly useful for our reference services." Boruff-Jones also includes a list of seven questions for librarians to ask when purchasing a new chat reference system. Yet she does not suggest considering how the patrons will react to the system.

Librarians at Bowling Green State University also had to switch systems a year after they started their chat reference service. Broughton (2001) describes how the Jerome Library at Bowling Green initially used a free service called HumanClick that could push web pages and store "canned" messages. However, problems in connectivity and notification that certain features on HumanClick would no longer be free prompted the library to find a new system. Librarians at Jerome Library selected LSSI Virtual Reference Desk because of its many features, including patron queuing, transcripts of URLs pushed, and two days of training from company representatives.

Choosing and staffing the system was also an issue at North Carolina State University. Boyer (2001) discusses the first hundred days of employing LSSI Virtual Reference Desk at his institution. In choosing the system, librarians at NCSU were especially concerned with the ability to push web pages and co-browse databases with patrons. Boyer claims that co-browsing proprietary databases in LSSI has been unsuccessful thus far.

Communication and Etiquette Issues

Once academic libraries had effectively established chat reference services, issues in communication and etiquette became topics of study. By definition, chat reference involves two or more people conversing remotely. The lack of physical cues, such as countenance and gestures, causes many barriers in communication. Another issue is culture that has grown around online chat. In the early days on instant messaging, college students and teenagers primarily used instant messaging. They developed their own informal rules of etiquette, including dialect, acronyms, and grammar.

Broughton (2001) and Boyer (2001) both discuss the attitudes of librarians and patrons toward chat reference. Broughton (2001) describes the sense of urgency that communicating online conveys because "users can conveniently communicate with you *at their time of need*." However, she realizes that the real-time convenience of online chat is what makes it so attractive to patrons. Broughton also admits, "The users don't seem to be as bothered by the length of the time it took (to send, have the other person read, and then reply and send back)" as the librarians. Therefore, although online chat might produce some initial anxiety in librarians, the patrons understand that searching and responding takes time.

Boyer (2001) examines a different aspect of online communication. He observes, "Most reference librarians at D.H. Hill Library, unlike many undergraduates, were not in the habit of chatting online before the service started." Boyer explains how the speed and carelessness of the undergraduates' messages cause some of the librarians concern. Online chat feels immediate, but the patron cannot see what the librarian is actually doing. One librarian interviewed says the awkward pauses and lack of visual clues make

her feel like she is playing “ping-pong under a strobe light” when instant messaging with patrons. In addition, Boyer discusses how the lack non-verbal cues affect the patrons’ expectations with response time. Since patrons cannot see where they are in an online queue, they do not understand why the librarian is not responding.

Fagan and Desai (2002) explore similar topics in a study of transcripts of online conversations. The study examines how librarians should tweak the reference interview for the online chat environment. Fagan and Desai find that the effectiveness of a chat reference interview can equal that of a face-to-face one. However, librarians need to use different strategies to keep the interview going. Humor and sympathy seem to keep the patron from becoming too impatient. In addition, providing interactivity by pushing web pages or co-browsing databases prevents the patron from becoming too frustrated; it allows the patron to see “what is happening behind the scenes.” The article also reveals that spelling and grammar are not as important in the virtual world.

Usage and Standards of Evaluation

Librarians have not written as much about the usage and evaluation of chat reference services. There has not been enough time for librarians to publish comprehensive statistics and evaluations, as the technology is still relatively new. Broughton (2002) again writes about virtual reference, but now simply states the results of a survey about the usage of digital reference. She reports on when digital reference is used the most (middle afternoon), user affiliation (74% undergraduate), question types (miscellaneous, articles for a topic, and known item) how users learned about the service (libraries’ home page), location of the users (on campus), perception of learning

(miscellaneous and useful online/print resources), and user satisfaction (92% reported the service to be helpful).

Some librarians have proposed standards of evaluation for chat reference services. Since 1997, an expert panel from Virtual Reference Desk has set guidelines for user transactions and the management of the service. McClure (2002) claims that the quality of a chat reference service can be determined by the courtesy of the staff, accuracy of the answer, user satisfaction, rate of repeat users, awareness and accessibility of the service, cost per transaction, and completion time of a question. A pilot study done by White, Abels, and Kaske (2003) tries to evaluate the quality of chat reference by using unobtrusive research methods. The study quantitatively measures the accuracy of answers, length of session, and length of waiting time for the patron for several chat sessions. Ronan, Reakes, and Cornwall (2002) discuss the challenges in evaluating the quality of online reference service because of a lack of standards and guidelines. They argue that there is not a set of "formalized standards" and there are too many informal user satisfaction surveys and volume of use measures.

The types of questions that patrons are asking via chat reference are also being studied. Many librarians make general comments about the types of questions in various categories (general, instruction, directional, etc.) but do not provide any statistics. However, in a study of the US Department of Energy Library, Patterson (2001) examines the types of questions being asked and categorizes them as being either document related or information related. Broughton (2002) also performs some basic sorting of question types coming into Jerome Library via chat reference.

Instant Messaging in the Library

Many of the chat reference case studies discuss the possibility of using AOL Instant Messenger as a chat reference system but dismiss it in favor of another system. Although it is not often included in case studies, many academic libraries are using the free service for chat reference. Foley (2002) discusses why the University of Buffalo chose to use AOL Instant Messenger instead of an expensive chat reference system.

> AOL offers free software along with name recognition and a system that is relatively easy to learn. The chat room accommodates multiple users and allows librarians to overlap during shift transitions…AIM has several helpful features, including the ability to easily send images, colorful emoticons, and hyperlinks.

Foley also mentions negative aspects of AOL Instant Messenger, including difficulty in accessing the system on occasion. Two other problems with the system are reported: AOL Instant Messenger does not collect statistics or allow librarians to send automated messages.

In spite of these negative aspects, Foley reports tremendous success with the system at the University of Buffalo, especially among young people. In a survey sent to users of the system, she posed the question: Why did you choose IM versus calling, emailing, or visiting the library? Many of the responses reveal the popularity of the AOL Instant Messaging service.

“most people I know are on AIM 24/7”

“because I’m allready on the computer”

“because, I can still browsing while waiting for my answer =)”

“Easy, fast, and cool”

Use of Instant Messaging by College Students and Teenagers

Although people of all age groups chat online (Madden 2003), instant messaging became a social norm for teenagers and college students before it was diffused into other generations. A report entitled *Teenage Life Online: The Rise of the Instant Messaging Generation and the Internet's Impact on Friendships and Family Relationships* from the Pew Internet and American Life Project (Lenhart, Rainie, and Lewis 2001) discusses the use of instant messaging among adults and teenagers in America in 2000. Although 74% of the teenagers asked had used instant messaging, only 44% of adults had tried the technology. Of the teenagers using instant messaging, 69% used it several times a week.

The Internet Goes to College, another report from the Pew Internet and American Life Project (Jones 2002), shows that college students use the technology as heavily as teenagers do. Almost three quarters of college students had chatted online; of these, 35% used instant messaging on a daily basis. Almost a third reported that online chat their primary form of communication. The report also reveals that students often multitask while using instant messaging systems.

> There was evidence of "multitasking" going on in the computer labs. For example, students used multiple programs at once, logging in to an instant messaging program while working on papers, browsing Web pages while working on an assignment."

The report asserts that using several applications at the same time defines the college generation.

> Multitasking will form part of the "convenience" mix for this generation as it matures. Opening and using multiple applications simultaneously (instant messaging, email, Web, word processing, spreadsheets) will be routine, and switching between those applications will be seamless in practice, and a market for integration of applications exists.

A group of students at Stanford University created the Mercury Project for Instant Messaging Studies in May 2003. (Cheung et. al. 2003) The project contains five papers about the social implications of instant messaging in a college setting. Informally, students participating in the project analyzed the various uses of instant messaging among Stanford students. They report that students use instant messaging to form networks of peers, keep up with friends and family, and say things they do not wish to communicate in person. At Stanford, 90% of the students interviewed instant message their friends and family daily.

Summary

After this review of the literature, it is clear that an analyses of chat reference systems need to be performed. Therefore, this paper will present a study of AOL Instant Messenger as a chat reference system, specifically in undergraduate libraries.

Methodology

Background Information

This study used two existing chat reference systems at the University of North Carolina at Chapel Hill for data collection. UNC Chapel Hill is a large, public, research university with 15,961 undergraduates; the institution is a member of the Association of Research Libraries. The main library on campus is Walter Royal Davis Library, with over 2,500,000 volumes. This library serves undergraduates, graduate students, and faculty members in all of the schools at UNC Chapel Hill. Davis Library began offering chat reference service in 2001, using LSSI Virtual Reference software. This system was chosen for two reasons. First, the Health Sciences Library on started its own chat reference service with LSSI earlier in 2001. Secondly, UNC Chapel Hill is a member of the consortium Triangle Research Library Network (TRLN). Other libraries in TRLN were already using LSSI Virtual Reference software and thus could assist in its implementation. A link to Live Online Help from Davis Library can be found on the UNC Libraries' home page.

The R. B. House Undergraduate Library is another library on the UNC Chapel Hill campus. It is much smaller, with only 75,000 volumes. However, it primarily serves the 15,961 undergraduates on campus. In 2003, the R. B. House Undergraduate Library began offering chat reference using AOL Instant Messenger. A link to the IM a Librarian service can be found off the R. B. House Undergraduate Library's home page. The IM a Librarian service is now very popular, consistently receiving more chat requests for help than Davis Library's Live Online Help each month.

Study Procedures

In this study, the investigator provided an initial screening survey to 46 undergraduates at the University of North Carolina at Chapel Hill. For three days, the investigator offered the survey to undergraduates in two prominent locations at UNC Chapel Hill: in front of the R. B. House Undergraduate Library and in front of UNC Student Stores. The purpose of the survey was to find students who had used the chat reference services and those who had not used the services. Undergraduates were encouraged to take the screening survey (Appendix A) in exchange for candy. Before the survey was provided, the investigator verbally informed the participant that this survey could lead to participation in a think aloud interview studying chat reference. After the screening surveys were received, participants were placed into different use groups:

1. Used AOL Instant Messenger, never used Davis Online Help, never used IM a Librarian
2. Used AOL Instant Messenger, used Davis Online Help, never used IM a Librarian
3. Used AOL Instant Messenger, never used Davis Online Help, used IM a Librarian
4. Used AOL Instant Messenger, used Davis Online Help, used IM a Librarian

From this pool of 46 undergraduates, members from each group were contacted to come in for an interview. Initially, the investigator randomly chose and consequently contacted 16 undergraduates. However, a low response rate prompted the investigator to contact all 46 undergraduates. Therefore, participants in the study were actually self-

selected. In other words, only undergraduates who were willing to participate came in for the think aloud interviews.

The investigator made all of the contacts via email (Appendix B). This email informed participants that they would be compensated for their time with five dollars in cash. In addition, participants would be able to ask for help with a research question while participating in the interviews. Only 13 undergraduates of the 46 contacted came in for a think aloud interview. In spite of the fact that only 13 undergraduates participated fully, the data collected from the interviews reached the point of saturation as described in the discussion of Glaser and Strauss (1967) about grounded theory.

The think aloud interviews took place over a period of five days. The participants had several options for time slots, in order to achieve maximum convenience for them. All of the think aloud interviews took place in a room called the Small Collaboratory in the R.B. House Undergraduate Library. This room is equipped with a round table, an IBM desktop computer, and a Macintosh desktop computer. The participants were given a choice of either computer for the purposes of the study; all of the participants chose to work on the IBM desktop.

At the beginning of each interview, the investigator went through an informed consent form (Appendix C). The investigator stressed that the interview would be audio taped and the privacy of the participant would be protected. When the consent form was signed, the participant received five dollars for the time and effort given. Next, the investigator asked if the participant had thought of a research question, as instructed in the contact email. Out of the 13 participants, 9 had formed a research question before coming into the interview. The investigator helped the other 4 participants to form

research questions that would help them in their summer school classes or school life. Then, the investigator provided an example of what a think aloud interview involves.

Then, the two chat reference systems were set up on the computer by the investigator. The investigator opened one Internet Explorer window and went to the Live Online Help entry form page (Appendix D). The investigator also opened up AOL Instant Messenger and added Undergradref to the buddy list (Appendix E). The investigator chose to use the AIM Express version of AOL Instant Messenger because it does not require a download. For each participant, the investigator created a new AOL Instant Messenger buddy name using a fake Yahoo! email address. The participant had the choice of putting in real or fake contact information in Live Online Help; all of the participants chose to enter real information. The investigator did not record any of the contact information in order to protect the privacy of participants.

The participants were given a choice of starting with AOL Instant Messenger or Live Online Help. The investigator began audiotaping the thoughts of the participants as soon as they sat down at the computer. Although the participants understood the parameters of think aloud interviews from the contact email and initial consultation, they still sought personal chat and confirmation from the investigator. In these cases, the investigator responded to the participant in order to make the situation comfortable. The investigator had to prompt all of the participants several times during the think aloud interviews. The following are examples of prompts made during the think aloud interviews:

- Keep talking.
- Tell me what you are doing.

- Tell me what you think of this.
- How does this make you feel?

The investigator posed one question to all of the participants during the think aloud interviews: Would you multitask while using either of these systems? The investigator always posed the question during a lull in the interview, after the participant had used both chat reference systems. The investigator asked this question because of the observations on multitasking made by the Pew Internet and American Life (Jones 2002) organization in *The Internet Goes to College*. Since multitasking "defines this generation," the investigator deemed it very important to draw this property out of the interviews. In fact, the issue of multitasking became a pivotal property of the use of AOL Instant Messenger.

Data Analysis

After the interviews concluded, the investigator listened to the audio recordings once to determine emerging categories. Once the investigator had an understanding of the content of the interviews, categories from relevant literature were reviewed. It was determined that categories from a Nahl and Tenopir (1996) study of novice database users would work well. This study used the think aloud methodology to determine how users unfamiliar with database interfaces performed tasks in databases. The Nahl and Tenopir study created a series of categories in order to code the questions asked by participants. This study uses the categories to code both questions and comments. The following categories made up the list:

- Seeking confirmation

- Formatting input
- Personal chat
- System image
- Search strategy
- Article content
- Clarification
- Screen format
- Showing surprise
- Progress check
- Time limits
- Obtaining things

Think Aloud Methodology

This study uses the think aloud method to obtain rich qualitative data about AOL Instant Messenger in the role of chat reference system. A think-aloud is a qualitative method for gathering data using verbal reporting. According to Branch (2000), verbal reporting is "bringing thoughts into consciousness, making the ideas verbal if needed, and then verbalizing them." Verbal reporting includes think alouds and think afters. The think-aloud is concurrent verbal reporting, meaning that participants say everything that they are thinking as they perform a set of tasks. Verbal protocols, including think-alouds, are described as methods for obtaining rich qualitative data. Ericsson and Simon (1984) discuss the use of concurrent and retrospective protocols as qualitative research methods in order to gather information about cognitive processes.

Several social scientists discuss the limitations of verbal protocols. Russo, Johnson, and Stephens (1989) explain that verbal reporting done properly reveals the thoughts of the participants but does not provide any explanations. He defines a verbal protocol as reactive if the verbal reporting changes the cognitive processes and invalid if it does not reveal the processes accurately. Wilson (1994) contends that the think-aloud method may not be valid with extremely complex tasks because thinking aloud overwhelms participants' cognitive abilities. However, he admits that "nonconscious information processing is rare, especially in the domains in which verbal protocols are typically used (e.g. problem solving, expert reasoning.) The think-aloud was determined to be valid for this study for two reasons. First, the tasks that these undergraduates performed in the study were simple. Typing messages and exploring interfaces are both routine to undergraduates, who frequently use the Internet for communication. (Jones 2002) Second, exploring interfaces and typing messages are both inherently verbal tasks and thus similar.

Another criticism is that the think-aloud might alter how participants complete tasks or solve problems. Ransdell (1995) investigated the use of think-aloud protocols with college students and tested the reliability of the think-aloud analysis. She had college students write three letters to their friends—one during a think-aloud, one under a retrospective protocol (think-after), and one under no protocol. Although the think-aloud slowed the rate at which the letters were written, it did not change the course or sequence of the letter writing process. The total number of words and clauses and the syntactic complexity did not change. Thus the think-aloud was not any more intrusive than other experimental methods. Typing messages to another person is very similar to the task of

letter writing because both processes are inherently verbal. Since Ransdell showed that thinking aloud does not alter letter writing, it was deemed an appropriate methodology for this study.

Similarly, Van Oostendorp and De Mul (1999) used think-alouds to study how people learned a computer system using exploration. The subjects, college students, completed a series of tasks using an unfamiliar interface without any training. The think-aloud seemed to improve the results of the exploration; the participants in the think aloud group were able to solve more problems correctly than the control group. Van Oostendorp and De Mul (1999) hypothesize that "thinking aloud positively influenced the metacognition…in the sense of monitoring and controlling one's own problem solving behavior. Working in a new chat reference system is like exploring any other new interface. Therefore the think aloud methodology in this study might have actually improved how successfully the participants received online help.

Grounded Theory

The think aloud methodology comes out of grounded theory. According to Glaser and Strauss (1967), grounded theory is "the discovery of theory from data systematically obtained from social research." Grounded theory works especially well with social science research and is used frequently in education and psychology. It offers researchers a valid way to obtain rich data without using a quantitative methodology. Glaser and Strauss (1967) argue that the process of comparative analysis is what makes grounded theory valid. Comparative analysis means that when a researcher listens to the first interview of the study, no conclusions are made. However, with the second interview the

researcher begins to draw comparisons. This method of comparisons continues through all of the interviews. From the comparisons, categories emerge. This study uses predefined categories from Nahl and Tenopir (1996) that were identified as relevant after the investigator went through the constant comparative method of analysis. This method is defined by four stages:

1. Comparing incidents applicable to each category
2. Integrating categories and their properties
3. Delimiting the theory
4. Writing the theory (Glaser and Strauss 1967)

The first step of this process involves coding data, either formally with categories or informally by jotting down notes. Often, coding requires the investigator to listen to the interviews several times. The second step involves flushing out the theoretical properties of the category, or the "full range of types or continua of the category, its dimensions, the conditions under which it is pronounced or minimized, its major consequences, its relation to other categories, and its other properties." (Glaser and Strauss 1967)

Delimiting the theory simply refers to finalizing it. After reviewing categories and their properties repeatedly, the theory takes shape. Then the investigator consolidates the number of categories. During the step, the categories reach saturation. A researcher using the constant comparative method knows when to stop analysis when a point of saturation is reached. (Glaser and Strauss 1967) Pomerantz (2003) explains how a researcher knows when data has reached a point of saturation:

> Glaser and Strauss do not offer any guidelines for recognizing when saturation has occurred; rather, it is a heuristic process, involving a great deal of subjectivity on the part of the researcher. Glaser and Strauss state, "after an analyst has coded incidents for the same category a number of times, he learns to see quickly

> whether or not the next applicable incident points to a new aspect" (p. 111). In other words, the researcher's familiarity with the categories into which entities are coded allows him or her to understand when no new categories are emerging from the data.

The point of saturation means that the investigator can begin to develop the theory, because not data is being obtained from the categories.

Results

Screening Survey

The investigator used the screening survey in order to place potential respondents in chat reference and instant messaging user groups. The survey asked candidates five questions; it also directed respondents to list their name, email address, and telephone numbers. This personal information was used only to contact respondents to invite them for participation in the think aloud interviews. All of their personal information was destroyed at the conclusion of the study. The following table shows the questions asked on the survey and the answers of the 46 respondents.

QUESTION	YES	NO
Are you a Student at UNC Chapel Hill	46	0
Are you an undergraduate student?	46	0
Have you ever chatted online in real time?	44	2
Have you ever used the Live Online Help service provided by the Davis or Health Sciences Libraries	10	36
Have you ever used the IM a Librarian service provided by the Undergraduate Library?	5	41

Originally, the investigator tried to find people from the following four user groups:

5. Used AOL Instant Messenger, never used Davis Online Help, never used IM a Librarian
6. Used AOL Instant Messenger, used Davis Online Help, never used IM a Librarian

7. Used AOL Instant Messenger, never used Davis Online Help, used IM a Librarian
8. Used AOL Instant Messenger, used Davis Online Help, used IM a Librarian

However, the investigator could not acquire these numbers. Many of the undergraduates invited to take the survey did not wish to participate. Although the investigator approached at least 150 students, only 46 opted to respond to the survey. The following table shows how the respondents break down by user group:

	Used Davis Online Help	**Never Used Davis Online Help**
Used IM a Librarian	3	2
Never Used IM a Librarian	7	34

There are several explanations for the numbers in each group. First, most students at UNC Chapel Hill have participated in online chat. The Mercury Project for Instant Messaging Studies (2003) discovered that 90% of students at Stanford University chatted online on a daily basis. Like Stanford, UNC Chapel Hill is a large, research institution that emphasizes information technology. In fact, incoming undergraduates are required to buy a laptop in order to attend UNC Chapel Hill. The CCI Initiative at UNC Chapel offers IBM laptops at a discounted rate to incoming students and many students take advantage of this offer. These laptops actually come equipped with AOL

Instant Messenger. Therefore, it was difficult to find students unfamiliar with the technology.

In addition, many undergraduates are unfamiliar with the Live Online Help and IM a Librarian services. One explanation for the students' unfamiliarity with the services is how they are linked to the libraries' web sites. Both services are available on the UNC Libraries web site, but the link is very small. (Appendix G) In addition, the libraries have not aggressively marketed their chat reference services.

Think Aloud Interviews

Of the initial 46 undergraduates, only 13 responded to the contact email. At least 5 students did not provide authentic contact information and thus could not be reached. The results of the interviews are based on the 13 undergraduates at the University of North Carolina at Chapel Hill that participated in the final portion of the study. The following table lists the answers of the 13 participants' screening surveys.

	Yes	**No**
Are you a Student at UNC Chapel Hill	13	0
Are you an undergraduate student?	13	0
Have you ever chatted online in real time?	11	2
Have you ever used the Live Online Help service provided by the Davis or Health Sciences Libraries	3	10
Have you ever used the IM a Librarian service provided by the Undergraduate Library?	2	11

Thus, the numbers break down into the following use groups:

	Used Davis Online Help	**Never Used Davis Online Help**
Used IM a Librarian	0	2
Never Used IM a Librarian	3	8

The investigator could not get anyone who had used both Live Online Help and IM a Librarian to come in for the think aloud interviews. However, both respondents who had used IM a Librarian but not Live Online Help agreed to participate the think aloud interviews. As expected, the largest use group consisted of students who had not used Live Online Help or IM a Librarian. From this group, two of the students had no

experience with instant messaging. The other 6 used AOL Instant Messenger for personal chat.

From the group of 46 potential respondents, 96% reported that they had chatted online in real time. However, only 85% of participants had chatted online before the study. There is a reason for the discrepancy in these numbers. In the group of potential respondents, 2 of the 46 claimed to have never chatted online. By chance, both of these potential respondents agreed to participate in the think aloud interviews. The original figure of 96% is close to the findings of the Mercury Project for Instant Messaging at Stanford University. The project's report from 2003 claimed that 90% of undergraduates at Stanford University use instant messaging on a daily basis. It is not a surprise that the figures from Stanford University and UNC Chapel Hill are similar. Both universities are large, research institutions that support an integration of technology and academics.

Categories

The investigator slightly altered one category for this study; article content was changed to message content. In a database, the user would get an article as the final product. In chat reference, however, the user would receive a message as the final product. Articles, websites, or other materials pushed to the participant during the session were not viewed as the final product, because the investigator is analyzing the systems and not the reference librarians. If the investigator were studying the quality of the transactions and not the systems, the materials pushed would have been considered. Therefore, article content was transformed into message content.

A new category, general chat reference, had to be created for coding purposes. There were many comments made by participants that specifically discussed their use of instant messaging and chat reference in their personal lives. At first, the investigator placed these comments in the personal chat category. However, it was later determined that with the large number of comments about instant messaging and chat reference it was necessary to make a new category.

Some of the categories from Nahl and Tenopir (1996) were not used. Participants did not make comments that fell into the following categories: system image, search search strategy, progress check, time limits, and obtaining things. In Nahl and Tenopir's study, the system image category "dealt with the searcher's cognitive need to understand system limits, capabilities, and processes." However, in this study, there were not comments of this nature. Participants did not question the capabilities of the chat reference systems, probably because most of them have so much experience in online chat. The progress check and time limits categories also did not apply in this study. The participants were told in the consent form (Appendix C) that the interviews would take fifteen minutes. Since all of the interviews stayed within the fifteen-minute period, patrons did not check on the progress. In addition, the investigator placed no time limits on the participants, so that category did not apply. Finally, Nahl and Tenopir (1996) did not explain the properties of obtaining things. However, it did not seem relevant for this study because participants were not searching for specific items, but rather online help. Participants did not perform known-item searches because they were instructed in the email to come to the interviews with a research question. They were not things that could be obtained from their chat sessions. The only items that were received by participants

were URL pushes. Comments about URL pushes were placed in the screen format category; URL pushes are further explored as a theme in the discussion.

The following list shows the categories that the investigator in this study used and the properties of those categories:

- **Screen Format**: The category for screen format refers to comments made about the appearance and functionality of the systems' screens. Properties in this category are layout, comfort level, and URL pushes.
- **Formatting Input:** Formatting input includes comments about how the participants' phrased questions and replies to the chat reference librarians; most of these comments are not pertinent to the theory raised from the study.
- **General Chat Reference:** The category general chat reference was not part of the original Nahl and Tenopir (1996) study but was necessary for this project. Issues concerning chat reference in general, instant messaging as an activity, multitasking, and the timeliness of the systems are properties this category.
- **Message Content:** The replies of the chat reference librarians as told by the participants are included in the message content category. Most of the comments in this category are irrelevant to the study because the investigator is studying the system and not the reference librarians. However, one important property of this category is the formality of the language in both systems.
- **Personal Chat:** Comments about the personal feelings and ideas of the participants are recorded in this category. Participants made personal chat comments to transform the interview into "a normal and reassuring human environment." (Nahl and Tenopir 1996) In addition, comments about the

personalities or demeanor of the chat reference librarians are placed in personal chat. Almost none of the comments in this category are relevant to theory built from this study because they are not pertinent to the discussion of instant messaging or chat reference.

- **Seeking Confirmation:** According to Nahl and Tenopir (1996), seeking confirmation is "the searcher's need to be supplied with continuous motivation to proceed with the search. All of the statements or questions in this category occurred when participants sought confirmation from the investigator. Confirmation questions took various forms, such as approval of a plan of action…" Many of the comments in seeking confirmation begin with "Should I…" or "Is this what…"
- **Clarification:** In clarification, comments about directions or tasks set out by the investigator are included.
- **Showing Surprise:** Showing surprise incorporates comments in which the participant showed surprise through an exclamation. By chance, all of the statements in this category occurred when participants successfully viewed a URL push through Live Online Help. Thus, URL push is a property of this category.

Once these categories had been determined, comments made by the participants were coded. For this study, a comment is defined as a complete thought. A comment can be a fragment or several sentences. The investigator coded comments by listening to the audio recordings and transcribing comments into relevant categories. Not every word of every comment was made by the participants in the interviews were transcribed. Instead, the investigator transcribed comments pertinent to the discussion of the two systems.

Comments, which did not pertain to instant messaging or chat reference, received tick marks in the correct category. In addition, comments that the investigator could not understand while listening to the audio recordings were given tick marks. The following table shows a breakdown of comments by category.

CATEGORIES	FREQUENCY	PERCENT %
Total Comments Coded	271	100
Screen Format	63	23
Formatting Input	56	21
General Chat Reference	53	20
Message Content	47	17
Personal Chat	27	10
Seeking Confirmation	12	4
Clarification	8	3
Showing Surprise	5	2

Major Themes

After the comments of the participants were coded by these initial categories, the investigator separated them by properties of the categories. These categories translate into the major themes of the study; they will be explored in depth in the discussion. However, the following table shows how many comments fall into the eight properties and whether the comments are positive, negative, or neutral.

		Never Used Either Service	Used Live Online Help, Never Used IM a Librarian	Never Used Live Online Help, Used IM a Librarian	Total
Layout	+	7	5	3	15
	-	14	1	4	19
	~	10	0	1	11
Pushing a URL	+	7	5	3	15
	-	6	1	1	8
	~	1	0	0	1
Comfort Level and Familiarity	+	14	5	1	20
	-	1	2	0	3
	~	0	0	0	0
Timeliness	+	5	1	1	7
	-	3	2	2	7
	~	2	0	0	2
Multitasking	+	3	0	0	3
	-	2	2	0	4
	~	2	5	2	9
Use of IM and Chat Reference	+	0	0	0	0
	-	0	0	0	0
	~	10	1	3	14
Formality of Language	+	1	0	2	3
	-	4	1	2	7
	~	1	0	0	1
Total		93	31	25	149

Limitations of the Methodology

During the course of this study, some limitations about the methodology were revealed. First, the four user groups were not represented equally; instead, one group was very large and one group was empty. The unequal distribution is a result of the demographics associated with instant messaging on a college campus. (Jones 2002; The Cheung et. al. 2003) However, if the study were to be repeated, the investigator would find different ways to seek out representatives from all user groups. Perhaps better compensation for the study would need to be offered in order to increase participation. A

larger sample might result in better representation of all groups, including the empty one. Alternatively, the user groups could be defined differently to obtain results that are more useful.

Another limitation stems from the nature of the think aloud methodology. Many participants insisted in trying to engage the investigator in conversation. The investigator tried to speak only when it was necessary to prompt the participant in the think aloud. However, there were times that the comfort level of the participant would have been jeopardized had the investigator not replied.

The subjective nature of coding comments and labeling them as positive, negative, and neutral is another limitation of this study. The labels applied to these comments came from judgments made by the investigator. The investigator attempted to make the coding process as scientific as possible. The use of grounded theory helped the investigator refine the coding process. However, the process could have more credibility if several investigators coded and labeled and then tried to reach a consensus.

Discussion

Layout

Participants made more comments about the layout of the two chat reference systems than anything else. The layout of the system refers to the way it looks and how information is placed on the interface. Most of the comments about the layout of the systems come from the screen format category. Participants commented on several aspects of both LSSI Virtual Reference and AOL Instant Messenger in regards to their layout, including the size of the interfaces, methods of connection, and the appearance of new messages.

In general, participants in all user groups considered the layouts of both interfaces easy to use and attractive. It is interesting that there are not as many comments about the layout of AOL Instant Messenger as Live Online Help. The fact that 11 of the 13 participants had used AOL Instant Messenger could have made it more difficult for them to discuss. One participant who had used IM a Librarian but not Live Online Help said of the latter, "It's easy to use and it's not very complicated…it gives you instructions so it's easy to access." However, the same participant noted that if AOL Instant Messenger "is the same service, it's credible, I would just use it…it's easier." This comment defines the thoughts about the layouts of the systems from all of the participants. Most participants did not make extremely negative comments about layout of Live Online Help. They simply showed a preference for AOL Instant Messenger. One explanation for the preference in layout is the familiarity of AOL Instant Messenger. The 11 participants who had used the IM a Librarian service or AOL Instant Messenger for personal use

found the system familiar and comfortable. However, even the two participants who had never used AOL Instant Messenger expressed that it was "easy."

The size and use of space of the two interfaces was an important issue for many of the undergraduates interviewed. In general, most participants made negative comments about the fact that LSSI Virtual Reference Desk takes up the entire screen of the user. The AOL Instant Messenger text window can be resized and the buddy list can be invisible. This format takes up significantly less room than LSSI. A participant who had never used either chat reference service noted, "It's a lot bigger than AOL…I don't know if you can change the size on that." The user went on to say that because of the size "it's a little more difficult to know where to put your question if you haven't had any experience on it." Another participant in the same user group said "instant messenger takes up, like, a sixth of your screen and this thing takes your whole screen but you have all of this space doing nothing." Therefore, participants from all of the user groups agreed that the size of the AOL Instant Messenger interface was preferable.

Many participants commented on the "space doing nothing" on the Live Online Help interface. A participant that had never used either service said, "It would be kind of more helpful if…cause this portion of the screen attracts your attention but it doesn't seem like now that it's useful. The participant was referring to the fact that the information on the left frame of Live Online Help does not change or disappear after a user has entered the chat session. However, a participant who had used Live Online Help before thought the information on the left to be "helpful." Moreover, another in participant in the same group commented, "right here on the sides are the information…it

looks official." Perhaps the fact that these participants had previous experience with the system made them more comfortable with its size.

The method of connection was another issue verbalized during the think aloud interviews. None of the participants expressed too much concern about how to connect to LSSI. Everyone figured out that the connect button had to be pressed. However, participants who had never used the service were hesitant. "Is it the connect…I guess?" asked one participant. Another issue was that the enter key could not be hit in lieu of the connect button. In AOL Instant Messenger, enter can be hit instead of the send button. Several participants unfamiliar with Live Online Help but experienced in instant messaging pressed enter instead of connect. "I hit enter and it gave me another space which I like the way AOL works better," one participant claimed. However, one participant in the same user group decided that not being able to hit enter might be an advantage. "Oh, huh, you can't hit enter…so that's one more thing but that might force you to think about what you're typing as well."

Of course, most of the participants had no trouble connecting to AOL Instant Messenger. As mentioned earlier, the participants familiar with instant messaging did not even discuss how they connected to the IM a Librarian service. Even if they had never used the IM a Librarian service, they had connected and chatted with peers online. However, the investigator had to the participants who had never used AOL Instant Messenger to connect to the service. One such participant noted, "I didn't know that. I haven't used IM so…" The same participant did not have hesitation about how to connect to Live Online Help. Therefore, for participants who had used AOL Instant

Messenger, connecting to IM a Librarian was easier than Live Online Help. However, it was the opposite for participants who had never used instant messaging.

The manner in which new messages appear in Live Online Help and AOL Instant Messenger is different. In Live Online Help, new messages show up at the top of the chat screen and move down. AOL Instant Messenger works in an opposite fashion. It should be noted that participants who had never chatted online made no comments about how messages appear on the screen in either system. Several participants who had chatted online but never used Live Online help were confused at first by the way new messages show up in Live Online Help. However, they had no problem adapting to the new system. "I didn't know how they responded, if it would be at the top so it's a little different but after reading it I understand better how it works," summed up one participant. Only one participant, who had used IM a Librarian but not Live Online Help, showed a real preference for AOL Instant Messenger's way of showing new messages. The participant said, "The new messages appear at the top and it works its way down which I guess makes more sense than AOL but since I've been using AOL forever it's a little confusing at first. AOL puts it at the bottom and scrolls up but I guess if you want to go back and read the whole conversation the way AOL does it is better." At this point in the interview, the participant did not know that Live Online Help emails users a complete transcript of their conversations.

Finally, the fact that Live Online Help requires the patron to go to a separate website caused participants familiar with AOL Instant Messenger discomfort. In AOL Instant Messenger, the IM a Librarian buddy name can simply be added to the patron's buddy list. Then, the patron can access the librarian simply by clicking on the IM a

Librarian buddy name. Of Live Online Help, one participant noted, "This works fine but you have to get to it." Yet another said, "AOL is on your computer already so it wouldn't hurt." Clearly, the convenience and familiarity of IM a Librarian's method of connection appealed participants who had used the system before. "I think that would be a lot simpler than going like to a whole other website and it would be working off a technology that I'm familiar with," said one participant. Yet another hypothesized that IM a Librarian would be used more because of its convenience. "If you could just add someone to your buddy list and you could just im them and not have to go to website you would use it more than you would normally." However, participants who previously had not used AOL Instant Messenger did not make any negative comments about Live Online Help separate web site.

Pushing a URL

Comments concerning pushing a URL in Live Online Help and IM a Librarian were different from those made about the layouts. Although all participants felt that a URL push in IM a Librarian worked well, they were divided in their reactions to URL pushes in Live Online Help. In AOL Instant Messenger, users can send a URL with a link that opens up a new window. The link is underlined and easy to recognize. Users simply have to click on the link to open the new window with the web site. However, LSSI Virtual Reference Desk allows librarians to make the web site actually appear on the left side of the interface. When the librarian sends the web site, the patron receives a text notification that a page was sent.

Participants from all user groups agreed that the URL push in IM a Librarian was adequate. The eleven participants who had used AOL Instant Messenger previously recognized the URL push immediately. As one participant commented, "I'm used to looking at hyperlinks in AOL." Another participant, unfamiliar with both services, noted, "I actually prefer this because you click on it it's not like boom, there." Even the participants who were unfamiliar with AOL Instant Messenger had no trouble receiving the URL push. "This is pretty easy," observed a participant without previous instant messaging experience. Therefore, the URL push in IM a Librarian worked well and caused no trouble for any of the participants.

URL pushes in Live Online Help received very different comments. At least three participants were completely in awe of the URL push; two of these participants had never used Live Online Help. "Oh did they send that to me...oh that's pretty cool, actually," said one. The other exclaimed,

> O.K. this completely rocks because she sent me right to the website…it's just awesome that they can send you directly to the website they send you right there and you can see what it is and with IM I have no idea where she's looking so I can't go back and look at it again.

The other participant wowed by the URL push had used Live Online Help but clearly had never received a link.

Other participants were not as enthusiastic about the feature. "You can't really tell how you're getting there, that's the problem…so finding this place, you don't know what's going on," said one participant who had used IM a Librarian but not Live Online Help. Twice, the URL push actually forced the participant out of the chat session. In this situation, one participant exclaimed, "Oh no, I can't see the page! I just lost it." Oddly

enough, in two instances the librarian did not push the screen but simply sent the text of the URL. This forced the participants to open a new window and actually copy and past the URL. "She's just sent me a link but it's not even the link it's just the…," said one confused participant." Another commented, "Well, I clicked the link and nothing happened." Hence, there was no consensus on the usability of the URL push in Live Online Help. Although the majority of the participants liked the feature, some had very negative comments about it.

Comfort Level

Several participants made comments about their comfort level with navigating the systems. Participants from all user groups expressed their comfort with using Live Online Help and IM a Librarian. In fact, no one explicitly expressed any discomfort with either system. Participants from all user groups labeled Live Online Help as "easy" and "pretty self explanatory." One participant, unfamiliar with both services, said that Live Online Help was similar to virtual message boards.

Every participant in the study noted his or her comfort level in IM a Librarian. Participants familiar with the AOL Instant Messenger all expressed that the system was easy to use. "I'm familiar with AOL since I've been using it since I was in 7th grade so it's pretty familiar so I like seeing it for this purpose," said one participant with no experience with either system. Another participant who had used IM a Librarian said, "I've used this a lot more so it's…it's more easy to use…" Even participants who had never used AOL Instant Messenger found it to be "pretty easy." However, they did not express as strong a comfort level in IM a Librarian as participants familiar with the

system. Nevertheless, participants expressed comfort in Live Online Help but they felt more at ease in IM a Librarian.

Timeliness

In this study, timeliness refers to the speed at which the systems, not the reference librarians, react to patrons' prompts. As previously mentioned, all comments about the reference librarians were placed in the personal chat category and ignored in the analysis. All of the users who verbalized the timeliness of the systems were critical of Live Online Help. The participants that made comments about timeliness came from all of the user groups; thus, previous experience was irrelevant in the analysis of this theme. "That seems kind of slow," observed one participant. It is interesting that participants who used Live Online Help second were particularly harsh about its timeliness. All comments about the timeliness of IM a Librarian were very positive. One participant noted, "4b. I feel that it doesn't take that long to type back and forth." Another of IM a Librarian said, "It seems quicker than the other." Thus a consensus about the timeliness of the two systems was reached by participants who made comments about that theme. It is faster to send and receive messages in IM a Librarian than Live Online Help.

Multitasking

Multitasking is the only theme in the study that includes comments resulting from direct questions from the investigator. The investigator asked all of the participants about multitasking while using the chat reference systems. Two participants, both familiar with AOL Instant Messenger but not the chat reference systems, discussed multitasking

without being prompted by the investigator. All of the participants with experience in AOL Instant Messenger agreed that multitasking was not just an option, but a necessity during the IM a Librarian chat session. "If I were doing something like this, I'd be doing probably ten thousand other things," said one of these participants. However, participants with the same experience decided it would be more difficult to multitask while in Live Online Help. The fact that Live Online Help does not make a sound when a new message is received bothered some participants. A participant observed, "The one disadvantage to that might be that it would be harder to do other things at once cause it doesn't make a sound." In addition, the fact that IM a Librarian would already be on a patron's buddy list made multitasking in that system more feasible. The general consensus of participants familiar with online chat can be summed up by this observation: "On AOL I write papers and look at stuff online, on the other system I would be less likely to multitask but I still would I mean after I get used to it, use it a couple of times."

One participant who had no experience with AOL Instant Messenger did not know if they would multitask in either system; only a "maybe" was given as a reply. However, another participant with the same experience level believed that multitasking was an option with both systems. This participant multitasked while doing other activities on the computer, like online searching and writing papers. "Sometimes I play games, like Yahoo! or internet games so I try to have a game so that my opponent is not waiting on me," the participant said. Thus, users' experiences with multitasking on computers, not necessarily in chat reference systems, determine whether they will multitask while getting help online.

Use of Instant Messaging and Chat Reference

Some participants made comments about their own observations about the state instant messaging in general. All of these comments came from participants who had used AOL Instant Messenger but were not familiar with either chat reference service. Of the participants who made general comments about instant messaging, all agreed that it was popular among their peers. "IM is a pretty big thing now I think" and "I don't know anybody without a buddy name" were two such comments. Some comments revealed the specific uses of AOL Instant Messenger in the participants' lives. The ability to put up an "away message" an use AOL Instant Messenger as a virtual answering machine was discussed frequently. One participant explained, "Turns out when I use AIM now I use it more as a message service because I'm always gone so I got an away message up and if someone needs to tell me something they leave me an IM ."

Other participants talked about their own thoughts and experiences with chat reference. A participant who had used IM a Librarian but not Live Online help made the following observation:

> I thought it was pretty cool when it first came out but since it is a free service you'd think that it would be easy enough for somebody in the computer science department, could just make a quick program of this and have the library have and operate it by itself instead of using AOL because they do have advertisements which I guess UNC isn't supposed to be using

Clearly, this participant felt that the fact that AOL Instant Messenger is a free service is a disadvantage. Two participants who had never used either service worried about the loss of quality through researching online. One of these participants said, "I do feel like it loses some of the research quality instead of going to the library yourself and actually talking to the librarians."

Formality of Language

Librarians chatting with patrons over Live Online Help and those using IM a Librarian have very different standards of grammar, spelling, and diction, in spite of the fact that all of the librarians are employed at the same university. Messages in Live Online Help tend to be more formal and grammatically correct than those in AOL Instant Messenger. There are several possible explanations for this phenomenon. First, there are probably more faculty and graduate student patrons using Live Online Help than IM a Librarian. Chatting with faculty and graduate students might make the Live Online Help librarians more careful with their messages. Second, there is a culture surrounding AOL Instant Messenger that encourages users to be reckless with grammar and spelling. AOL Instant Messenger has its own diction. As previously identified in this study, most undergraduates are AOL Instant Messenger users and fall into this culture. After reading the messages of undergraduate patrons, the IM a Librarian staff may have tried to mimic the writing style. Third, the formality of the Live Online Help service could encourage librarians to write more correctly. Live Online Help allows librarians to store "canned" messages and send them to patrons. These canned messages all use perfect grammar and spelling; librarians might use these messages as examples. Conversely, there are no canned messages in AOL Instant Messenger; it requires the librarians to interact with the patrons constantly. The fact that librarians using the IM a Librarian service cannot send a canned message could cause them to type more recklessly.

At any rate, comments about the formality of both systems were made by participants in all user groups. All of the participants agreed that Live Online Help was more formal than IM a Librarian. In fact, several participants did not realize that they

were talking to a real person in Live Online Help until well into their chat sessions. "So this is a real person doing this…talking to me?" and "Is this automatic?" two participants asked the investigator.

Most participants appreciated the informality of the IM a Librarian service. One participant explained why the librarian used lower case letters and incomplete sentences:

> You use lower case letters and fragments and not correct things but it's ok because they don't really expect you to write that well because it's instant and the errors you don't really have to feel really bad about it…

Another participant observed, "On AOL it feels like there really is a person…the other one I felt like I was sending it to a computer but in this case I felt like it was a real person." Still another felt that the syntax and grammar made the transaction feel like "talking to a friend." Thus, most of the participants viewed the informality in a very positive way. One, however, who had previously used IM a Librarian, decided that the informal language was unprofessional.

> I think when you're talking to somebody you don't know it should be more formal but uh and especially if it is a librarian you kind of want to and she's not for a librarian to be using wrong grammar I mean she should set an example…

Nevertheless, this participant was a lone dissenter from the majority of participants who preferred the language of IM a Librarian.

Conclusions and Recommendations

Further Investigation

This study is a step forward in the examination of chat reference. However, more studies of the usability of chat reference systems need to be performed in order to serve patrons better. In the following lists are questions that need to be answered in the future:

- What features do faculty members, graduate students, and other in-depth researchers prefer in chat reference systems? This study did not examine the preferences of these two academic populations.
- What features of the more expensive and complex chat reference systems are unnecessary or under used? This study did not focus on a system with a surplus of features. However, many academic libraries currently use expensive systems that are laden with features.
- How can academic libraries market their chat reference systems specifically to undergraduates? The screening survey in this study showed that undergraduates are largely unaware of chat reference services. What are some libraries doing to solve this problem?

Preferences and General Trends

Preference, in this study, was determined by the nature of the participants' comments. Five participants actually voiced a preference for one system. Four of the participants chose IM a Librarian and one preferred Live Online Help. The other participants' preferences were determined by their comments about the various facets of the systems. Overall, twelve of the thirteen participants showed a preference for IM a

Librarian. Only one participant, who was familiar with both systems, preferred Live Online Help. This participant felt that the URL Push factor made Live Online Help superior. The twelve participants who preferred IM a Librarian had various reasons for doing so. First, familiarity with AOL Instant Messenger was a common reason for preferring IM a Librarian. Thus, the participants' previous use of AOL Instant Messenger was an important factor in determining preference. Second, the ability to multitask was another important facet of IM a Librarian. Participants identified features of IM a Librarian that made multitasking easy, like the ability to resize the window and add the IM a Librarian name to the patron's buddy list. Finally, the lack of formality made IM a Librarian the top choice among participants. The interface itself is informal; it allows for emoticons and different colored fonts. The window, as mentioned earlier, is flexible in size. The language used in IM a Librarian is relaxed and is not constrained by grammar or diction. These undergraduate participants grew up in the era of AOL Instant Messenger and are familiar with the culture around it.

Why do all of these features of IM a Librarian make it the preferred system among college undergraduates? The bottom line is comfort level. College undergraduates feel comfortable in AOL Instant Messenger. In order to reach out to patrons, librarians need to make them feel comfortable enough to ask for help. Thus, using a system that puts patrons at ease is a logical choice.

Should all libraries use AOL Instant Messenger? This study cannot answer this question. However, the investigator suspects that the answer is no. Faculty members, graduate students, and members of the public might not like all of the features of AOL Instant Messenger. However, this study does claim that libraries that primarily serve

college undergraduates should consider choosing AOL Instant Messenger as a chat reference system.

Appendices

Appendix A Screening Survey

The Advantages and Disadvantages of AOL Instant Messenger as a Virtual Reference System

Are you a student at the University of North Carolina at Chapel Hill?

Yes No

Are you an undergraduate student?

Yes No

Have you ever chatted online in real time? (for example, used AOL Instant Messenger)

Yes No

Have you ever used the Live Online Help service provided by the Davis or Health Sciences Libraries?

Yes No

Have you ever used the IM a Librarian service provided by the Undergraduate Library?

Yes No

Please provide the following personal information. This information will only be used in order to contact you for participation in the study. It will not be included in any results or research reports that result from the study. This survey will be destroyed at the conclusion of the research study.

Name: _____

Email: _____

Home Phone: _____

Cell Phone: _____

Appendix B Contact Email

Dear *Potential Participant's Name*:

Thank you for completing the initial screening survey for my research project last week. You have been selected to move on to the interview portion of this project. If you choose to participate, I will ask you to come to the Undergraduate Library for a ten minute interview. In return, you will receive five dollars in cash at the conclusion of the interview.

Background on the Project

I am a graduate student in the School of Information and Library Science and I am completing this research project in order to earn my master's degree. The purpose of this project is to identify the advantages and disadvantages of a certain chat reference system. Chat reference, also known as virtual reference, is a tool that allows library patrons to ask librarians questions online.

What Will Happen During the Interview

During the interview, you will complete a set of tasks using a chat reference system. Then you will complete the same tasks using a different chat reference system. The three tasks will revolve around a research question. Basically, you will be asking reference librarians questions online for information to answer your research question. You can use a question that you need answered for a class or you can simply make up a question. If you cannot think of a research question, I can help you think of one.

As you complete these tasks, you will think aloud. In other words, you will say everything that comes to mind. I will be silent during the interview. The interview will be recorded on audio tape. Before the interview, you will be asked to sign a permission statement. The statement will explain that I can use the information recorded during the interview but I cannot use your name or any other personal information. It also informs you that the audio tapes and all of your personal information will be destroyed at the conclusion of the project.

As I said before, you will be paid five dollars in cash at the conclusion of the interview.

Scheduling the Interview

If you would like to participate, please email or call me. I am conducting interviews at the following times:

Thursday, June 24: 1:00, 1:20, 1:40, 2:00, 2:20, 2:40, 3:00, 3:20, 3:40, 4:00

Friday, June 25: 9:00, 9:20, 9:40, 10:00, 10:20, 10:40, 11:00, 11:20, 11:40, 12:00

Monday, June 28: 1:00, 1:20, 1:40, 2:00, 2:20, 2:40, 3:00, 3:20, 3:40, 4:00, 4:20

Tuesday, June 29: 9:00, 9:20, 9:40, 10:00, 10:20, 10:40, 11:00, 11:20, 11:40, 12:00

Sincerely,

M. Brooke Phillips

Appendix C Consent Form

The Advantages and Disadvantages of AOL Instant Messenger as a Virtual Reference System

Introduction to the Study:

- I am inviting you to be in a research study that explores chat reference in undergraduate libraries.
- A chat reference system is a tool that allows patrons to talk with librarians in real time over the Internet.
- This research study will examine two specific systems: AOL Instant Messenger and LSSI Virtual Reference Desk.
- This research study will involve sixteen to twenty participants.
- This research study will gather data for a master's thesis.
- Ms. Brooke Phillips, a graduate student in the School of Information and Library Science at UNC Chapel Hill will be conducting the study. Her faculty advisor is Dr. Jeffrey Pomerantz.

Purpose

- The purpose of this study is to determine the advantages and disadvantages of AOL Instant Messenger as a chat reference system.
- I hope to use what I learn in this study to help college and undergraduate libraries choose an appropriate chat reference system.

What Will Happen During the Study:

1. You will come to the R. B. House Undergraduate Library Room 124 for an interview. The interview will take approximately ten to fifteen minutes. I will be the only person in the room with you.
2. I will ask you to collaborate with a reference librarian to answer one of your own research questions using AOL Instant Messenger and LSSI virtual reference systems. The links to these virtual reference systems will be provided for you. If you are unfamiliar with connecting to the these systems, I can will help you set up your chat.
3. You will be provided with an AOL Instant Messenger screen name. The screen name will not give away any of your personal information.
4. This question can come from a class assignment or you can make one up. You will go through five steps during the interview.
5. While you are going through the five steps, you will be thinking aloud. Thinking aloud means that you will say everything that goes through your mind as you solve these problems.
6. I will not speak during the interview, except to help you connect to the systems or prompt you if you stop thinking aloud.
7. The interview will be recorded on audio tape with your permission.

8. You will receive $5 at the conclusion of the interview.
9. If you have any questions or concerns about this study, you should contact Ms. Brooke Phillips at (919)785-3021 or mbphilli@email.unc.edu or Dr. Jeffrey Pomerantz at (919) 962-8366 or pomerantz@unc.edu.

Your Privacy is Important:

- I will make every effort to protect your privacy.
- I will not use your name or affiliation in any of the information I get from this study or in any of the research reports.
- I will destroy all of the interview audio tapes at the conclusion of the study.

Risks and Discomforts:

- I do not know of any personal risk or discomfort you will have from being in this study.

Your Rights:

- You decide on your own whether or not you want to be in this study.
- If you decide to be in the study, you will have the right to stop being in the study at any time.
- You also have the right to ask that the tape recorder be shut off at any time during the study.

Institutional Review Board Approval:

- The Academic Affairs Institutional Review Board (AA-IRB) at The University of North Carolina at Chapel Hill has approved this study.
- If you have any concerns about your rights as a participant in this study, you may contact the AA-IRB at (919) 962-7761 or at aa-irb@unc.edu.

I have had the chance to ask any questions I have about this study, and they have been answered for me.

I have read the information in this consent form, and I agree to be in the study. There are two copies of this form. I will keep one copy and return the other to the investigator.

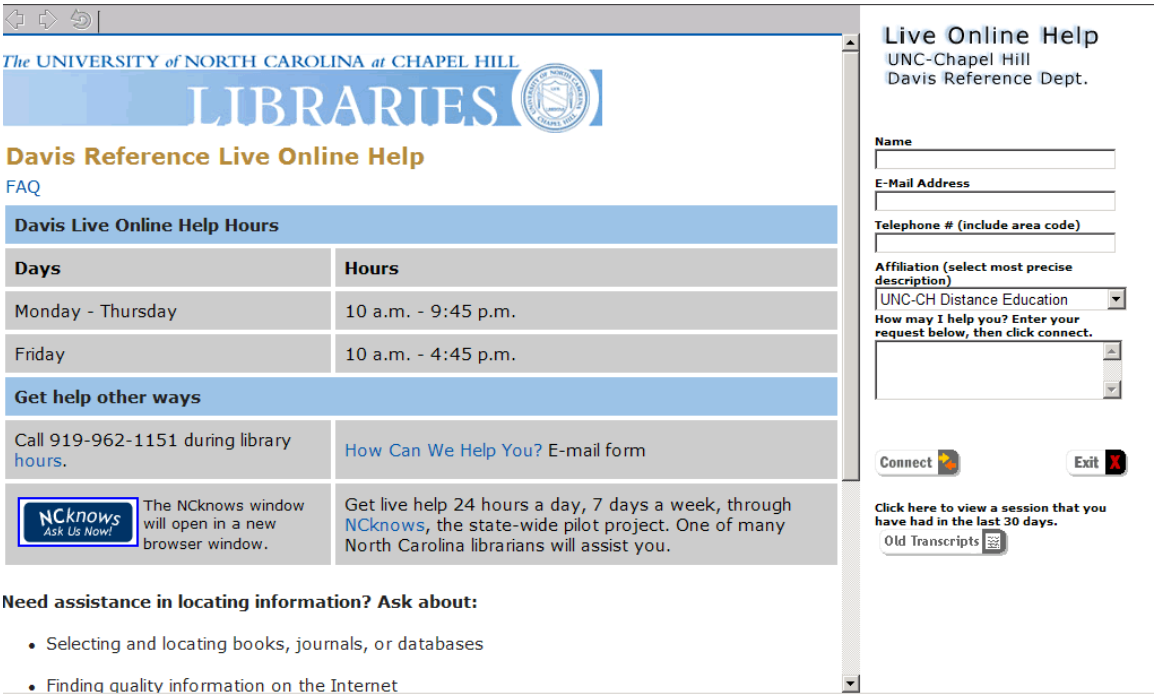
_____ _____

(Signature of Participant) (DATE)

_____ Yes. I give my permission for this interview to be recorded on audio tape.

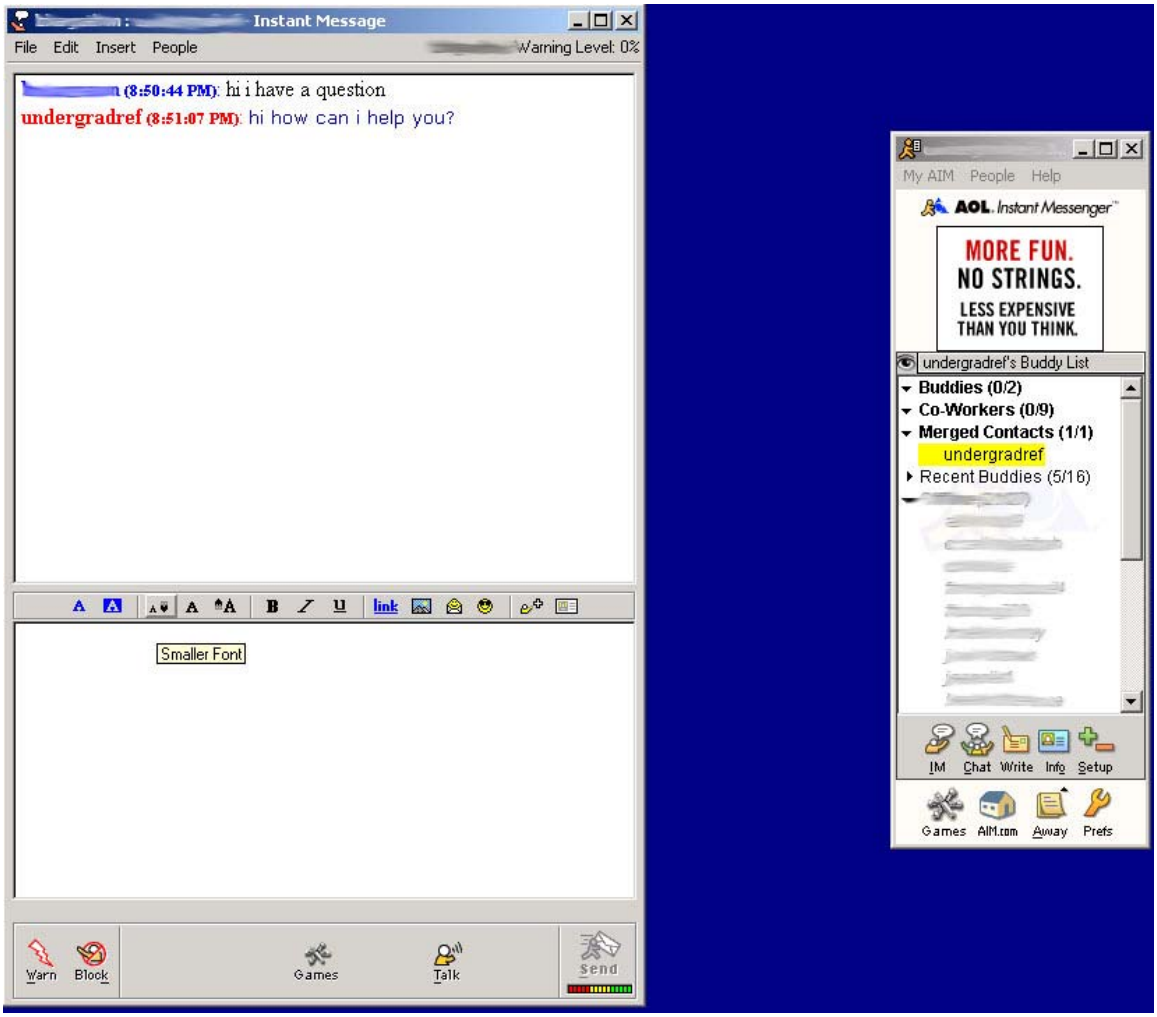
_____ No. I do not give my permission for this interview to be recorded on audio tape and thus I will not participate in this study.

Appendix D Live Online Help Interface



The right frame shows where the patron enters in contact information. At the bottom of the right frame is the text entry box. Users have to hit "connect" to send their information. The left frame displays information about Live Online Help. When a URL is pushed, it appears here.

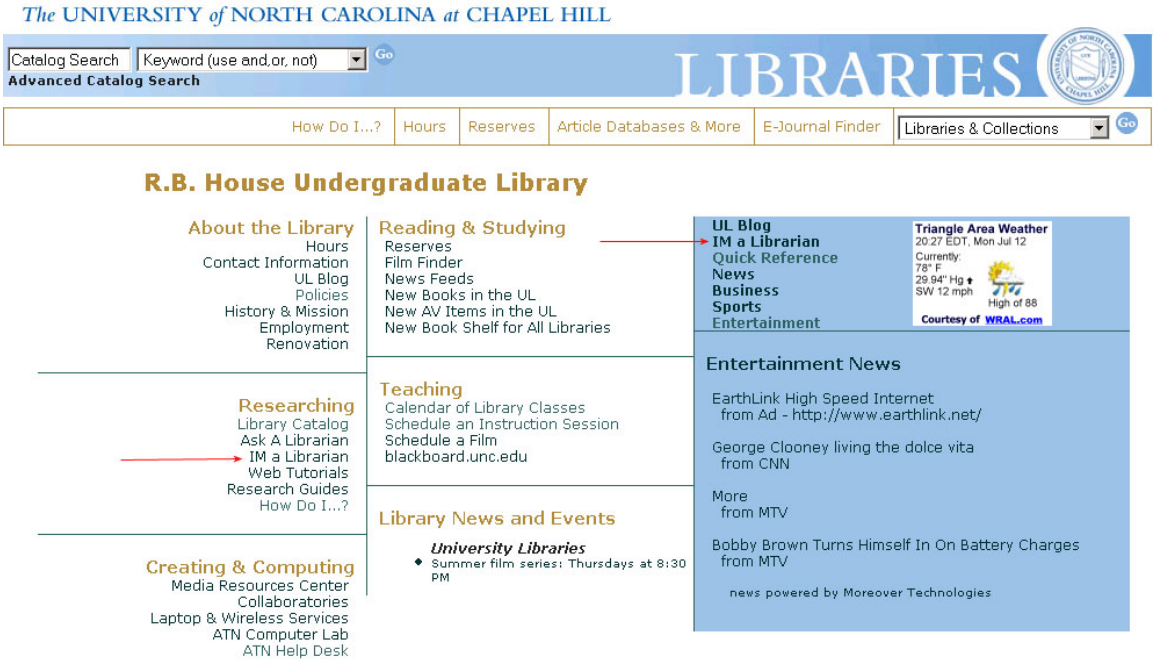
Appendix E IM a Librarian Interface



The window on the right is known as the AOL Instant Messenger "Buddy List." To this list, users add their contacts' screen names, also known as buddy names. The user clicks on the name of the contact and the text entry box, as seen on the left, appears. In the text entry box, the newest messages appear in the top half, and users type their messages in the bottom half. The newest messages appear on the bottom. This text box allows users to type in various fonts of many colors; it also lets them send emoticons.

Appendix F The Live Online Help and IM a Librarian services are only available from this "chat" link on the UNC Libraries' web site.

Appendix G There are two links to the IM a Librarian service from the R. B. House Undergraduate Library's web site.



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