As libraries seek to provide more ways to meet information needs in our rapidly evolving electronic environment, increasingly university libraries are providing reference services via virtual reference mediums such as chat services. Researchers have begun examining these services yet little study has been done concerning the experience of non-native English speakers in this medium. This study was conducted to determine the value and effectiveness of virtual reference services for international students.

Participants were instructed to ask a reference question of the chat reference service of the University of North Carolina at Chapel Hill Libraries and then to complete an online questionnaire in response to that interaction. Results point to a greater comfort level with chat reference vs. face-to-face interactions for a majority of participants and provide a basis for further study into methods and practices to improve service to non-native English speakers.

Headings:

College and university libraries -- Reference services

Foreign Students

Reference services – Evaluation

Use studies -- Reference services

Electronic Reference Services

College and university libraries -- Services to minorities

NATIVE LANGUAGE AND THE REAL-TIME VIRTUAL REFERENCE
INTERVIEW

by
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A Master's paper submitted to the faculty
of the School of Information and Library Science
of the University of North Carolina at Chapel Hill
in partial fulfillment of the requirements
for the degree of Master of Science in
Library Science.

Chapel Hill, North Carolina

November 2009

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INTRODUCTION

For librarians in academic libraries the scope of reference service continues to evolve. All academic libraries must handle the task of satisfying patron information needs within a continually changing and complex environment, with an ever-growing suite of tools from which to choose. In order to make effective decisions about which tools are appropriate for which users libraries must have not only an understanding of their patrons' information needs, but an understanding of which tools their patrons are most comfortable using. In libraries' quest to become excellent facilitators of their patrons' information needs it is important that reference services and tools be constantly evaluated for their effectiveness. Currently the Reference and User Services Association (RUSA) of the American Library Association (ALA) defines reference transactions as "information consultations in which library staff recommend, interpret, evaluate, and/or use information resources to help others to meet particular information needs."[1] Using this model, libraries seek to engage and increase information literacy across a very diverse set of patrons, with disparate needs. Libraries do this in a multitude of ways – they keep later hours, they staff more access points, they work with instructors to develop curricula, and they answer reference questions in person as well as through email and via phone. In the continuing evolution within our current dynamic library environment, and

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[1] For a full description of this definition, as well as those of other organizations, see RUSA's website.
<http://www.ala.org/ala/mgrps/divs/rusa/resources/guidelines/definitionsreference.cfm>

as libraries seek to provide more ways to meet information needs, increasingly university libraries are providing reference services via "virtual reference" mediums, such as Instant Messaging (IM) and "chat" software. This interactive environment opens up a wide expanse of options for librarians and patrons to communicate over great distances while sharing research strategies using a medium that many of today's American university students have grown up using for personal communication.

Yet although a bevy of research has commenced on this emerging service, there seems to be a dearth of research on the effectiveness of this service for patrons who do not have a complete grasp of the language used for this interaction. Particularly, in the United States, virtual reference at academic institutions is provided primarily using American English. But this begs the questions, how does this affect those who were not raised speaking and writing this language? Considering that a minimum of 1428 of the 28916 students currently studying at UNC-Chapel Hill are currently classified as "foreign students," and then taking into account the likelihood that there are a substantial number whose first language is not English but are U.S. residents, the number of students for whom English is not their first language is significant; this points to an obvious area in need of exploration.[2] Many of the academic institutions in the United States have a large population of international students whose first language is not English. Some of these students have not grown up interacting in a virtual environment; or if they have, they may not be familiar with the style and vernacular used during chat or IM sessions by American students. Based on the literature it seems fair to say that the latter is a more

[2] The number of "foreign students" attending UNC-CH in the fall of 2009 can be found on the webpage of the International Student and Scholar Services: <http://oisss.unc.edu/about_us/profile.html>. Total registration numbers for UNC-Ch in the Fall of 2009 can be found at the registrars page: <http://regweb.oit.unc.edu/stats/reports/cntqk099.html>

common scenario; therefore the basic hypothesis is that the language barrier, more so than technology, may create difficulty in effective chat reference transactions. These potential concerns lead toward more specific questions such as: Is chat an effective tool for these students? If not, what would a more effective tool be? Is there any way this tool can be improved to better meet this group's needs? Is the staff appropriately trained to deal with international students? If the service is deemed appropriate for this group, what kind of outreach might need to be done to engage students with this service? If it is not an appropriate service for their information needs, what is? Is there a standardized method that can be established for librarians and library staff to better serve virtual reference patrons who are not native English speakers?

Before any of these questions can be answered data must be collected on the effectiveness of chat reference as a tool for these students – this study seeks to do just that. More specifically it has been created to answer the question: in what ways do the varying degrees of proficiency with the English language affect instant messaging and chat-based reference services for non-English speaking International students as compared to English-speaking American students in an academic library?

The intent of this study then is to ascertain how a lack of mastery of the English language affects the quality of reference services international students receive via chat services, and what can be done to address communication problems this study reveals. Aims of the study include helping librarians to better understand if chat reference is more or less comfortable for these students than face-to-face reference. Specifically, should reference departments amend their current practices to better serve this community, and if so how? These results can be used as a starting point for best practices for chat reference

with international students, as well as pointing to areas for further study. The ultimate aim of this, and future studies, is to improve the level of chat service provided to patrons for whom English is not their first language.

LITERATURE REVIEW

The literature relating directly to international students and their interaction with virtual reference is limited. However, there are areas of study that can inform this topic, including the effectiveness of chat reference services and the accepted practices for reference interactions with international students. These areas are reviewed in the context of possible bearing on chat reference services used by international students.

Virtual reference can refer to several forms of online communication between librarians and the patrons they serve. According to the American Library Association, "virtual reference" is defined as "reference service initiated electronically, often in real-time, where patrons employ computers or other Internet technology to communicate with reference staff [and] include chat, videoconferencing, Voice over IP, co-browsing, e-mail, and instant messaging."[3] Although reference can take many forms, all "reference encounters are goal-directed information-seeking environments" (Radford, 2006, 1046). Chat reference, unlike email reference, is a closer cousin to the more traditional face-to-face interview. Research suggests librarians should perceive it as a spoken genre of language rather than a form of written communication with students; further, although not encouraging "substandard dialect" in the interaction, certainly a relaxation of the rules of Standard English is warranted to create more patron satisfaction (Maness, 2008,

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[3] See Reference and User Services Association's *Guidelines for Implementing and Maintaining Virtual Reference Services.*
<http://www.ala.org/ala/mgrps/divs/rusa/resources/guidelines/virtrefguidelines.cf>

p.38). There are differences though; for example chat reference varies from face-to-face interviews in that library clients are unable to seek out familiar librarians – although a patron can return to the "same service time and time again," it is unlikely that they will interact with the same librarian again (Radford, 2006, 1047). This creates a strange hybrid of the more traditional reference interactions, where the interview is written, but reliant upon the verbal structure of a face-to-face interaction.

The popularity of chat reference is apparent as this service is offered in more and more libraries throughout the country. The response to this service by patrons has been primarily positive in most cases for the better part of the decade. In 2002 a study done by Ruppel and Fagan found that 82% of their 340 survey respondents found IM or chat reference to be a "very good method of getting help" with their information needs (Ruppel, p. 188). This positive trend is found in much of the literature over the years; a similar question asked in Kwon and Gregory's 2007 study found that of 417 respondents, 65.2% percent were satisfied with the answer received in their chat reference experience (Kwon, p.141). However there are some aspects of this service that may deliver obstacles to effective reference service.

One hindrance to effective communication in virtual environments is an apparent decline in the use of a full reference interview. As stated in the commonly quoted definition given by Bopp & Smith, a reference interview is a "conversation between a member of the library reference staff and a library user for the purpose of clarifying the user's needs and aiding the user in meeting those needs" (Bopp, 1995, p. 37). During this process, according to the Reference and User Services Association (RUSA) *Guidelines for Behavioral Performance of Reference and Information Service Providers*, "open-

ended questioning techniques" should be used to clarify a patron's original question.[4]

These clarifying questions are essential to ensuring the patron's true information need is

fulfilled and effective reference service is provided. Yet in a 2006 study of 50 chat

reference services throughout the United States that looked to discern the adherence to

(or deviation from) these guidelines, only 41% of librarians in the sample used open-

ended questions to encourage the user to express what information they hoped to find

(Ronan, p. 17). Another study published in 2006 entitled "Evaluating Virtual Reference

from the Users' Perspective" revealed that of the 85 virtual reference interactions studied,

librarians conducted a reference interview in only 20% of the exchanges (Nilsen, p. 69).

If reference interviews are not constantly employed in virtual reference services, the risk

undoubtedly increases that the effectiveness of this service for those without a clear grasp

of the English language may be hampered by the inability for clear communication.

To further inform how these interactions may occur with patrons who are non-

native English speakers, a review of the familiarity of international students with libraries

and computers upon their entry into a university is warranted. One interesting study was

done by Yoo-Seong Song in *Reference Services Review,* entitled "International business

students: a study on their use of electronic library services." In this study, Song explores

the "perceptions and expectations of electronic library services at the University of

Illinois at Urbana-Champaign" (Song, 2004, p. 367). This study put forth the idea that

many international students had little to no experience with library services, especially

virtual reference services. In fact, Song found that 43% of the 143 study participants had

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[4] Refers to point 3.7 of the RUSA Guidelines found here:
<http://www.ala.org/ala/mgrps/divs/rusa/resources/guidelines/guidelinesbehavioral.cfm>

no prior experience with electronic library resources in their home countries (Song, 2004, p. 370).

There is evidence that while there is a lack of experience with virtual reference services among some international students, they often have a very high rate of experience in the use of computers. In Pamela Jackson's study "Incoming International Students and the Library: A Survey," 94% of the international students who participated in her study had used a library in their home country, and of those 84% had used a computer inside of that library. She also found that 96% of students regularly use the Internet, and 93% had used email at some time in the past (Jackson, 2005, p. 202). This supports the hypothesis that it is language, not technology skills, that may hinder real-time virtual reference services.

Looking at language and international students, some studies address the common problems that the differences in native languages have caused in the interactions of reference librarians and these patrons. In their article "Reference Service to International Students: A Field Stimulation Research Study," Ann Curry and Deborah Copeman effectively summarize the problems that exist between international students and librarians:

> Language barriers - the major obstacle for international students - usually result from the reference librarian's inability to understand students because of variations in pronunciation, intonation, speech patterns, and enunciation. The barrier may also result from international students' inability to express their information need correctly. (Curry, 2005, p. 410).

These barriers translate to the virtual reference experience as well, since it is plausible that international students may have the same inability to express their information need via chat as they do in person. Contributing to this barrier are the findings of Kumar and

Suresh in "Strategies for Providing Effective Reference Services for International Adult

Learners."   They found that often international students were unclear that the primary

role of a reference librarian is to answer questions, and therefore may be hesitant to ask

questions (Kumar, 2000, p. 334). This can reasonably be interpreted to extend to chat

reference services; it is unlikely that those students who are unaware of the role of

librarians will be aware that they serve this role online as well.

Conversely, there are aspects to the suggested interaction with international

students that point to conditions in which chat reference could in fact be more effective.

Ann Curry cites guidelines for effective communication with international students

detailed by Joan Ormondroyd that include maintaining simple sentence structure and

vocabulary, speaking clearly and slowly, and rephrasing questions (Curry, 2005, p. 411).

These guidelines can all be translated to the chat environment - a successful interaction

could be achieved with clear, concise responses to a patron's questions, and clarifying

follow-up questions. Furthermore, a paper written by Kwasi Sarkodie-Mensah of

Northeastern University in 1992 offered the simple suggestion that librarians should

"listen to [international students'] words, not their intonation" (p.214). This idea can

explain another possible benefit to reference in the virtual environment: as the intonation

of these patrons' words would be absent, the librarians can focus on their words, and thus

provide better service. Moreover, students have the time, in a chat reference situation, to

read a response slowly, to look up unknown words, rather than trying to process quickly

what someone is saying.

There is an ample amount of research on virtual reference in libraries today, such

as the earlier cited studies by Maness and Radford, and there appears to be a respectable

amount of research, as discussed previously, dealing with the language issues international students may have with librarians. Still the lack of research on international students' use of and interaction with chat reference calls for a study that explores international students' use of virtual services.

METHODOLOGY

In order to examine non-native English speakers in virtual reference interactions this study took a two-pronged approach; questionnaire results were evaluated in conjunction with chat transcripts.

Participants were asked to take multiple actions. First, participants were asked to anonymously ask a reference question of the online chat reference service offered by the University of North Carolina at Chapel Hill (UNC-CH) Libraries through their "contact us" page. Next, the participant could optionally send a copy of their transcript to the investigator to be analyzed. Sending the transcript was optional to ensure the comfort and privacy of the participant. Privacy was further protected by the anonymous nature of the emailing of transcripts directly from UNC Libraries' webpage. In addition, if any identifying information was found in the transcript, the investigator removed any such information. Finally, the participants were asked to complete an online questionnaire regarding that online chat reference experience.

In order to gain responses from a participant base consisting of non-native English language speakers, a link to the questionnaire[5], along with a brief informational statement providing the details of the study, was distributed to potential participants through the

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[5] The questionnaire used in the study was designed using Qualtrics software through UNC-CH's Odum Institute.

Writing Center of UNC-CH's "English Language & American Culture" (ELAC) email newsletter. At the time of this study, this newsletter had an approximate subscription of 412 recipients.   It should be noted that the use of this newsletter to recruit participants was in no way based on the assumption that participants would have a poor grasp of the English language, or even that they would not be excellent English speakers. The general observational assumption is made that varied levels of fluency are the norm among international students; therefore participants that are excellent English speakers, as well as beginner and intermediate level speakers, would hopefully provide a more accurate picture of potential chat issues, and address the main of objectives of the study in discerning whether any stylistic phrasing, shorthand, slang or abbreviations used by many Americans in chatting were a detriment to communication.

Recipients of this newsletter who chose to follow the link were taken to an instructional page that directed them to open the UNC Libraries' "contact us" link in a new internet browser window in order to ask a chat reference question before returning to the questionnaire (See Appendix C). Participants were given the option of either asking a question of their choosing, or of using one of the two sample questions provided. A question of the participant's choosing was preferable; however it was taken into account that some participants might find choosing a question of their own too difficult. In order to not discourage any potential participants from completing the chat and questionnaire, two sample questions were also provided. Once the chat was completed, participants were given the optional instruction to email their chat transcript to the investigator, and then asked to return to the original webpage and begin the questionnaire.

Despite the investigator's initial hope to analyze all participants' chat transcripts along with the questionnaire results, the decision to make the submission of chat transcripts optional was reached for three reasons. First, the software used by UNC Libraries for chat reference, libraryh3lp, does not allow for transcripts to be automatically sent; neither does it provide an option for making this compulsory.[6] The structure for chat reference with this software allows for complete anonymity for both the patron and the librarian – no identifying information is required to be entered by the patron when asking a question via the chat widget on the library webpage and the library staff member who answers the chat is not required to provide identification. The only way for a chat transcript to be collected outside of internal library use is for the patron to optionally click on a small icon of an envelope within the chat widget and enter an email address to which the transcript will be mailed (see step #4 of the Instructions, Appendix C). This limitation precipitates the second reason emailing the chat transcript was made optional: the additional step required in the process. When considering likelihood of participants' completing this questionnaire, it was thought that for students without a strong grasp of English each additional step could be a contributing factor in a participant becoming frustrated and choosing to stop before completing the questionnaire. This seemed a valid concern given the small and inconspicuous nature of the email icon. The third concern with the transcript collection was for the privacy and comfort of the patron. While the process of chatting and sending the transcript is anonymous, the participant may have accidentally identified himself or herself in some way within the text of the chat; making the transcript optional gave yet another assurance of anonymity.

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[6] Details of the structure and workings of libraryh3lp can be found here: <http://libraryh3lp.blogspot.com/>

The questionnaire was designed with the goal of being worded as clearly and simply as possible in order to maximize comprehension by participants. Following introductory questions, the first three questions of the questionnaire were designed to ascertain the participant's basic familiarity with library services (see questions 5, 6, 7 in Appendix D). The next part of the questionnaire addressed respondents' familiarity with using computers for communication (see questions 8 and 9 in Appendix D). The third section addressed the participants' online interactions with reference library staff, including their level of satisfaction and comfort (see questions 10 through 15 in Appendix D). Two open ended questions were added at the end of the questionnaire to give participants an opportunity to write in any complaints, thoughts, and/or concerns that they thought would improve their next virtual reference interaction (see questions 16 and 17 in Appendix D).

The study was designed to elicit both quantitative and qualitative data. After the data was collected, questions 1 – 11 were analyzed quantitatively. This section was intended to statistically highlight potential problem areas in the chat reference interview. The final two questions were an attempt to capture problems and potential solutions that the previous 11 questions may have missed.

The anonymous transcripts were examined to provide the investigator with a more nuanced understanding of the chat process, as well as to determine if any issues arose that were unforeseen and/or unaddressed within the questionnaire. It was also hoped that the analysis of these transcripts would point the way to future areas of study. In order to protect the anonymity of the participants, the individual transcripts were not linked to the questionnaires in any way and therefore could not be used to analyze specific

questionnaire responses. Instead they were used to holistically inform the evaluation of the overall questionnaire responses.

RESULTS AND DISCUSSION

Twenty-nine individuals began the online questionnaire. However of those 29, only twelve participants answered every question. Only 13 of the 29 (44.83%) proceeded past the third question.   Of those 13, four listed their native language as Chinese, two were listed as Spanish, and the remaining responses were listed as one of each of the following: Turkish, Italian, Japanese, Hindi, Telugu, and English. The answers from the respondent who listed "English" as their native language were filtered out of the analysis. Furthermore, if response to the second question ("I have asked a librarian a question on UNC Libraries' homepage and am ready to take the questionnaire") was "NO," those responses were also filtered out from the final analysis.   Once these two categories were filtered out, the number of participants who proceeded through the first 15 questions of the questionnaire totaled 10. The final two questions, in which the users were given the opportunity to type in how they felt the interaction with the librarian could have been improved, and then add additional comments, were answered by 6 and 4 participants, respectively. One unexpected result that was briefly looked at as possibly affecting results was the response to question 3 ("Are you currently enrolled as a student at UNC?"). The assumption was erroneously made that as the recruitment email was distributed to a newsletter whose subscribers were required to be students at UNC-CH, the overwhelming response to this question would be "yes." However, 50% of the original pre-filtered respondents, and 60% of those remaining after the filtering

mentioned above, answered that "no," they were in fact not currently enrolled students. Despite this discrepancy, data from respondents who responded in the negative to this question were not filtered out; enrollment status should not have a bearing on the effectiveness of a reference interaction. After the filtering of data described above, it is clear that these numbers are too small for a meaningful statistical analysis. Therefore the analysis of the data is primarily qualitative in nature, and trends discussed should be viewed as possible rather than fully confirmed through statistical analysis. Due to this, this study should be considered a pilot that points to both areas for further research into the efficacy of chat reference services for non-native English speakers, and to differently structured approaches for data collection in future studies.

The question of why such a large percentage of participants did not fully complete the questionnaire is quite interesting. One possibility is that the density of the language in the "fact sheet" required by the Institutional Review Board may have been overwhelming to those with a limited grasp of English. If this supposition is true it would make meaningful the percentage of students who started but did not continue the questionnaire. Of course there are many other possible reasons why participants may not have completed the questionnaire: the time required may have been daunting, they may not have been interrupted, the questions may have been confusing, or a myriad of other causes. Although there was a high rate of nonresponse to certain questions, it was not to all questions. The nonresponse in and of itself points to a need to restructure the administration of the study, and could be statistically significant if the supposition about it being those with a more limited grasp of English who quit the questionnaire early.

Furthermore, the high response rate of those who progressed past the third question lends validity to the study and the limited results it yielded.

In terms of participants' familiarity with online communication, it was apparent that most were quite savvy. In response to the question of whether respondents knew what the terms Instant Messaging (IM) or online "chatting" refer to (question 6), 100% of the 10 (post-filtered) respondents said yes.[7] And in response to question 8, "have you used some form of chat software in the past?" only 1 out of 10 responded that they had not.

Participants' usage of libraries before this study was not as universal as usage of chat software in general, particularly in a virtual setting. When asked if they had ever asked a librarian for help (question 5), 70% responded that they had. But when asked if they had ever asked a librarian a question via email or chat (question 7), only 50% responded in the affirmative.[8]

Response to questions dealing directly with the chat interaction with library staff was generally positive. 57% of respondents to question 9 stated that they were able to communicate their questions in English via chat "very well," while the remaining 43% responded "somewhat well." There were no responses in the negative ("not very well" or "poorly") to this question. When asked if their question was answered to their satisfaction (question 10), 40% responded that it was "fully answered" while the remaining 60% responded that it was "partially answered." As in question 9, there also were no responses in the negative to this question. When asked if the librarian asked questions to better understand how to answer their original question (question 11), 70%

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[7] This statistic does not change when the pre-filtered results are taken into account – 100% of all respondents still said yes.

[8] These numbers sink to 42% when the pre-filtered responses are taken into account.

of respondents said that they did. Of those who answered yes to question 11, 100%
responded that those questions asked by the librarian helped to clarify their original
question (question 12). And in response to whether they had any unanswered questions
about the answer they received (question 14), only one respondent answered yes. When
asked if they would use this service again, (question 15), 100% of participants responded
that they would.

Of particular interest is the response to question 13 (was chatting online easier or
harder than asking a library employee a question in-person?). One of the initial
hypotheses at the outset of this study was that the virtual reference interaction had the
potential to be more difficult if English was not your first language. Based on the
completed responses however, demonstrated in the chart below, the opposite was true for
these respondents. Over 80% of respondents felt interacting with a librarian via chat was
similar in difficulty or easier than face-to-face interactions; over 40% felt it was much
easier.

Was chatting online easier or harder than asking a library employee a question in-person?
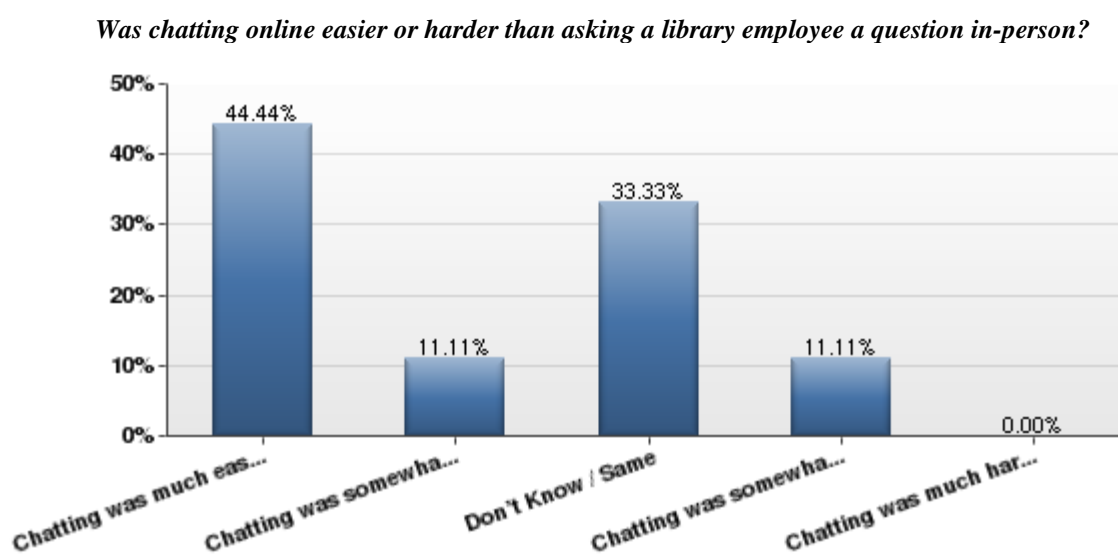
This result is reinforced by two of the six written responses given to question 16. When asked if they felt their interaction with the librarian could have been improved, four of the participants responded with suggestions regarding the format, structure, and/or design of the chatting experience (such as excessive links given by librarians, interface design suggestions, etc). Two respondents however provided comments related to the ease of the chat interaction. One of these respondents stated: "Actually, this is my first time to chat with a librarian. It is really easy and convenient. I will do next time." But of particular interest is this second response: "No, i think for internationals it is easier to communicate in written form than speaking. Speaking is really hard, sometimes I do not understand the answer when I speak to a librarian in person. Writing is much more easier." This same respondent, in the space provided for additional comments, also stated, "It was perfect, once, I asked for TOEFL study guide and he/she sent me direct link." It is important to note that this was not a universal attitude among respondents to the virtual reference experience. In the space provided for additional comments or suggestions (question 17), one of the four respondents had this to say: "Depending on the question type, I think sometime talking to the person would make it easier than typing and explaining what you really need." A review of this individual's questionnaire reveals that they were the one respondent who felt they had unanswered questions about the response they received from library staff to their original query.

The final portion of the study to be analyzed was the chat transcripts. Unfortunately, the analysis of the chat transcripts did not provide as much insight as hoped into the possible benefits and/or obstacles for effective communication between library personnel and the participants. The relatively small number of transcripts

received may partly explain this. Of the 11 participants who confirmed that they did ask a chat reference question via UNC Libraries' webpage, 5 choose to email the transcript to the investigator. Initial review of these transcripts seems to generally reflect fairly smooth communication between the participant and library staff, and a positive outcome for the patron. Since the chat transcripts were kept anonymous there was no way to analyze which chat transcript was associated with which questionnaire – so it was not possible to compare the few respondents who did encounter problems in the service to their transcript.

The majority of the transcripts received reflected a strong grasp of the English language on the part of the patron. Throughout all five transcripts there were no questions from patrons asking for the librarian to clarify any statement, nor were there questions from a librarian asking the patron to clarify their language. There were some examples of a patron not having complete command of grammatical rules of English, such as in this exchange:

1. **Patron**: Hi, can you help me finding books about the TOEFL test?
2. **Librarian**: Hello
3. **Patron**: hi
4. **Patron**: I searched library's website but i could not find
5. **Librarian**: are you looking for a study guide?
6. **Patron**: yes
7. **Librarian**: and are you a student at unc-ch?
8. **Patron**: my wife is a student
9. **Librarian**: I just did a simple search for toefl, there are study guides and electronic resources.
10. **Patron**: can you send me the link that you enter the key word
11. **Librarian**: here is also a page for online access to testing prep http://eresources.lib.unc.edu/eid/description.php?resourceID=987&passthrough=no

12. **<u>Librarian</u>**: and here is the link for keyword search toefl
    http://search.lib.unc.edu/search?Nty=1&Ntk=Keyword&Ntt=toefl
13. **<u>Patron</u>**: thank you very much

It can be inferred from lines 4 and 10 in particular that English language grammar does not come clearly to the patron. However, this was not severe enough to adversely affect the ability of either the patron or the librarian from understanding the other.

These transcripts, however, do not necessarily reflect the experiences of a majority of the participants. It is conceivable that those who completed the questionnaire and also emailed their transcript may have been most proficient in English among the participant pool; for those who had a better grasp of the English language may have been more likely to complete the entire process of the study. This is of course purely conjecture; further study would be required to understand who is likely to complete a study such as this, and why.

In addition, although not directly related to analysis of the data, information was found within two chat transcripts that helped to explain how persons who were not enrolled at UNC-CH found this study: when the librarian in each chat, in an attempt to determine their level of access to library resources, asked if the chat patron was a student at UNC-CH, one patron responded "no but my husband is a grad student" and the other responded "my wife is a student." The possibility that spouses may share email addresses or even simply view each other's email messages had not been considered.

Although the results as a whole didn't lend themselves to meaningful statistical analysis, the consistent finding within the questionnaires pointed to chat interactions being more comfortable or as comfortable a medium for the majority of respondents than

face-to-face interactions with librarians. They also point to a high familiarity with online communication tools and procedures.

One interpretation of the results of this study is that those who completed the entire chat and questionnaire procedure may have been the most proficient with English among the [ELAC] newsletter recipients. For these students, the results point to an ease with chat not anticipated. Yet the density of the language required to be included in a study by the Institutional Review Board in the "fact sheet" (see Appendix B) alone could have been enough to discourage participants with a limited grasp of English to abandon the study. If so, it is possible the potential participants who actually need the most help may have been missed.

If this is the case, a subsequent study may receive a higher completion rate by a change in design. Rather than a self-guided online questionnaire, a chat interaction and questionnaire administered in-person by an investigator who is available to verbally explain their rights as well as the instructions, and to answer any questions the user may have throughout the process, could help to limit participant frustration during the process and ensure a higher rate of completion. A study designed in this manner could be tailored to reinforce the results of this study that point to the positive efficacy of chat reference, as well as possibly capture a larger percentage of students who may have struggled with the online questionnaire.

What was not asked in the study was whether or not students knew about the library's chat service before the questionnaire. The results so far point to chat being a better medium than face-to-face interactions for these participants. The next study should include a question to ascertain whether or not participants are currently aware of library

chat services. If students are not aware, or as aware as they could be about this service, further study should work to determine what kind of outreach and publicity would be most effective in reaching these students and apprising them of this service.

CONCLUSION

The results of this study did not conform to the original suppositions of the investigator. Based on the literature regarding international students' interactions with librarians and the commonly used shorthand used in chat, it was hypothesized that communication between these patrons and librarians would likely be more difficult via virtual reference than in face-to-face interactions. Yet the responses received point toward the opposite conclusion. Not only does it seem that virtual reference service is useful to those who are aware of it, but the consensus among the majority of respondents is that this interaction is as effective as or more effective than face-to-face reference assistance. In light of these results it is possible to see where the previous research on reference interviews with international students supports this. For example, Curry and Coperman noted that the librarian's "inability to understand students because of variations in pronunciation, intonation, speech patterns, and enunciation," are barriers (Curry 410). Based on responses to the questions in this study, these barriers seem to be largely minimized if not removed in an electronic medium. And although the results were not large enough for statistical analysis, they do provide a basis for further study into methods and practices to improve service to non-native English speakers. Future studies should strive to not only reinforce (or disprove) these findings, but to answer questions proposed earlier, such as how library staff can be appropriately trained to deal with international students in this medium, and what kind of outreach might need to be

done to engage students with this service. It would also be important for future studies to include larger and randomized sampling. This would help ensure that the results are not specific to the proficiency of the participants at the outset of the study. Non-optional linked transcripts, if privacy concerns could be addressed, would be helpful in better analyzing breakdowns in communications that may have occurred during the interview.

This is an exciting time for libraries and librarians, as the rapid and continuous emergence and growth of new technological tools for reference services change the way we think about assisting our patrons. With these changes, existing reference constructs must be altered to work in these new mediums, to ensure all possible patrons benefit from this growth. This population includes the large and growing number of international students attending U.S. universities. The ability of these international students and reference librarians to communicate in real-time in an online setting, and thus to have the most effective reference transaction, is just one aspect of these changes; but it is definitely an important enough aspect to warrant further study. In this exciting field of study there is a lot we still have to learn about how virtual reference services are used by all populations and how we can improve it. By ensuring that all possible patrons have equal access to the highest levels of reference services librarians can offer, we ensure the library's continued place as an essential part of all students' education experience.

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APPENDIX A: RECRUITMENT EMAIL

Volunteers wanted for study!

My name is Sundeep Mahendra and I am a student in the School of Information and Library Science at UNC. I am looking for volunteers to participate in a research study of library service to students in an online environment. Specifically, of virtual reference (or "chat") service to students whose first language is not English. Volunteers will be asked to ask one research (or "reference") question of a librarian online via the UNC Libraries website (which will be provided), and then to complete a brief questionnaire about that experience. The study will require no more than thirty (30) minutes of your time and is completely voluntary. The questionnaire can be found online at
http://uncodum.qualtrics.com/SE?SID=SV_3kILu9G8UbnlRXu&SVID=Prod

If you wish to participate in the study, just click the link and follow the instructions at a time of your choosing before the deadline of 11/10/2009. After completing the questionnaire you will be given the chance to enroll in a drawing for a $25 gift certificate from Amazon.com!

This research has been approved by the Institutional Review Board at UNC-CH (IRB Study # 09-1909). This study will include up to 30 participants. The study is conducted under the supervision of Dr. Jeffery Pomerantz (jpom@ils.unc.edu). Please contact me at mahendra@email.unc.edu if you have any questions.

Questionnaire Link:
http://uncodum.qualtrics.com/SE?SID=SV_3kILu9G8UbnlRXu&SVID=Prod

APPENDIX B: Fact Sheet
(Appeared at beginning of Qualtrics online questionnaire)

General Information about this Study:
- I am inviting you to be in this study to examine the interaction in a virtual environment between reference library staff and students whose first language is not English.
- Your participation, along with up to an estimated thirty other people, will help us better understand how best to serve students who are not native English-language speakers.
- The chat and questionnaire are estimated to take no more than 30 minutes of your time.

- Sundeep Mahendra (mahendra@email.unc.edu) at the University of North Carolina at Chapel Hill is conducting this study as part of his master's paper at the School of Information and Library Science, under the supervision of Dr. Jeffery Pomerantz (jpom@ils.unc.edu).

Purpose of this Study:
- The purpose of the study is to examine how non-native English speakers interact with reference librarians online in order to learn how best to serve this population.

What Will Happen During the Study:
1. You will be asked, at your convenience, to go to the UNC Libraries' homepage and ask one reference/research question (of your choice) via the library "contact us" box. More detailed instructions will be provided once you consent to participate -- at the bottom of this page.
2. After completing this "chat" and, if you choose to do so, emailing the transcript, you will be asked to answer the 15 questions in this online questionnaire to tell me about your experience.
3. You will have the option to enroll in a drawing for a $25 Amazon.com Gift Card at the end of the questionnaire.

Your Privacy is Important:
- I will make every effort to protect your privacy.
- I will not ask for or use your name in any of the information collected from the study or in any of the research reports.

Risks and Discomforts:
- I do not foresee 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.
- You will not be treated any differently if you decide not to be in the study.
- If you decide to be in the study, you will have the right to stop being in the study at any time.
-When completing the questionnaire, you may skip any question for any reason.

If You Have Any Questions:
- If you have any questions or concerns about the study, please contact me, [Sundeep

Mahendra, (404) 840-3066, mahendra@email.unc.edu], or my advisor, [Dr. Jeffery Pomerantz, (919) 962-8064, jpom@ils.unc.edu].

What if you have questions about your rights as a research participant?
All research on human volunteers is reviewed by a committee that works to protect your rights and welfare. If you have questions or concerns about your rights as a research subject, or if you would like to obtain information or offer input, you may contact the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu. Please reference study # 09-1909 in your communication.

Question:
1. I have read the information in this consent form, and I agree to be in the study.
         · YES, I agree.   · NO, I do not agree.

APPENDIX C: Instructions
(Appeared in Qualtrics online questionnaire, immediately following the "Fact Sheet")
Please carefully read the instructions below.
Instructions:
1. Open the following website in a second internet browser window or tab:
     http://www.lib.unc.edu/ask.html

2. In the "Ask a Librarian" box on the left of that page, ask/type a research question about a topic you would like to learn more about. Please feel free to use your own question, or one of the examples below.
   Example Question (1):
   Can you help me to find articles about my paper topic _____?
       (Can you help me to find articles about the rainforest?)
   Example Question (2):
   Can you help me find book reviews for the book _____?
       (Can you help me find book reviews for the book The Sound and the Fury?)

3. Continue the conversation with the librarian for as long as you feel comfortable and/or until you feel your question has been answered.

4. (OPTIONAL) Before you close the browser, click the envelope to "email transcript" button and enter this address: mahendra@email.unc.edu (see example below)
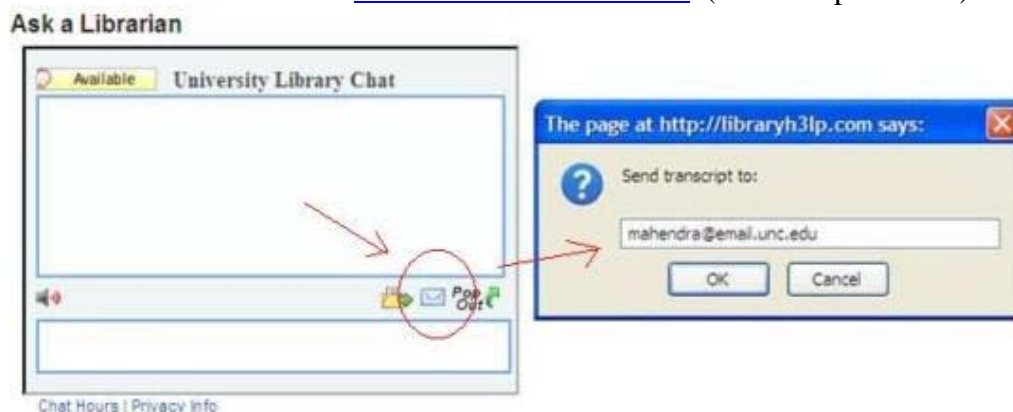
5. Come back to this page and complete the questionnaire to tell me about your experience. Thank you for your participation!

Question:
2. I have asked a librarian a question on UNC Libraries' homepage and am ready to take the questionnaire.
YES NO

APPENDIX D: Questionnaire *(duplicated on Qualtrics)*

Introductory questions:
3. Are you currently enrolled as a student at a UNC?
4. What is your native language?

5. Have you ever asked a library employee for help?
     YES   NO
6. Do you know what the terms Instant Messaging (IM) or "chatting" refer too?
     YES   NO
7. Have you ever emailed or IMed/"chatted" with a librarian for help before?
(such as for coursework, directions, books?)
     YES   NO
----
8. Have you used some form of chat software in the past
(such as Yahoo Messenger, AOL Instant Messenger, GoogleTalk/Gchat)?
     YES   NO
 9. How well do you feel you are able to communicate your questions in English through chat services?
     Very Well   Somewhat Well   Don't Know   Not Very Well
     Poorly
----
10. Was your question answered to your satisfaction?
Yes –fully answered   Partially answered   Don't Know   Not well answered
     No – not answered at all
11. Did the librarian ask you questions in order to better answer to your question?
     YES   NO

12. If you answered yes to question 7: Did you find the questions they asked helped you to clarify your original question?
Yes, very helpful Somewhat helpful   Don't Know   Only slightly helpful   No, not helpful at all
13. Was chatting easier or harder than asking a library employee a question in-person?
(Skip this one if you answered" no" to question 1)
Chatting was much easier
Chatting was somewhat easier
Don't Know / Same
Chatting was somewhat harder
Chatting was much harder
14. Did you have any unanswered questions about the answer you received?
     YES   NO
15. Would you use this service again?
     YES   NO

Please type in your answers to the questions below. Feel free to include as little or as much information as you wish.

16. Did you feel your interaction with the librarian could have been improved? If so, how?

17. Additional comments/complaints/suggestions:

APPENDIX E: OPTIONAL Drawing Entry
(Appeared at end of Qualtrics online questionnaire)

18. Please enter your email address below if you wish to be entered in a drawing to receive a $25.00 Amazon.com gift certificates.

Your email will not be linked with nor used to identify your questionnaire responses. It will only be used to select and contact the winners, and will be deleted upon the completion of the drawing.

Please contact the Principal Investigator, Sundeep Mahendra, if you have any questions regarding this study (mahendra@email.unc.edu, 404-840-3066). Thank You!

[_____]