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Egyptian and American Internet-Based Cross-Cultural Information Seeking Behavior. Part I: Research Instrument

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Abstract

This article is the first of three in an exploratory study of the cross-cultural, cross-language information-seeking (IS) behavior of a group of eighty-four academic and public reference librarians from Egypt and the USA. The present article describes the design of the cross-cultural research instrument used to record the behavior of participants when presented with a choice of information resources in several languages unfamiliar to them. A review of literature demonstrates the need in cross-cultural investigations for a multi-tiered approach that allows analysis from different perspectives. A detailed description of the design rationale for the interview model is given, which includes a cultural background questionnaire providing data designed to enable comparative analysis of the search performance of sub-groups. Instructions on how to manage cross-language searches complete the interview. A discussion of the usefulness of the methodology in discerning cultural universals, differences, and the IS needs of cross-cultural researchers is followed by conclusions and suggestions for further research.

Keywords

Information seeking behavior; Reference librarians; Cross-language information retrieval; Academic and public libraries; Cultural anthropology; Cross-cultural psychology; Global web site design; Online catalog usage; Foreign language anxiety studies

Introduction

This article is the first of three in an exploratory study of the cross-cultural, cross-language information-seeking (IS) behavior of a group of eighty-four academic and public reference librarians from Egypt and the USA. Data was collected from these research professionals in interviews between November, 2005, and July, 2006. The present article describes the design of the cross-cultural research instrument used to record the behavior of participants in the interviews, and assesses the usefulness of its methodology in discerning cultural universals, differences, and the IS needs of cross-cultural researchers. Part II of the research, in preparation and to be presented in a subsequent article, will provide an overview of [Islamic book and information culture](#). Part III, the data for which has been collected, will examine results and applications, using salient points of the cultural overview of part II to assist in assessing findings.

Sharing in multilingual scholarly research

The technology enabling instant sharing of new ideas in many languages is rapidly becoming viable around the world. Spearheaded by the cross language information retrieval (CLIR) congresses and the Cross-Language Evaluation Forum (CLEF), increasingly accurate access to written work through provisional, machine translations (MT) is opening the way to international information exchanges across cultures. Although technological challenges remain ([el Hadi, 2003](#)), it is clear that people who use sophisticated cross language search tools to harvest ideas from non-mainstream, non-English language thinkers, will be rewarded with unique resources.

The abundance of current cross-cultural research projects confirms that culture is an important consideration across many disciplines. Scholars thinking in different languages and living in diverse cultures approach research questions differently and problem solve in ways that are influenced by their culture. Factoring in these variations in mind-set can yield enhanced results, heightened productivity, and extraordinary creativity.

In contrast to the large number of scientists researching CLIR and MT, the IS behavior of scholars who will be using those systems to search for ideas in other cultures is a relatively understudied field. The following research questions were formulated to explore this area of cross-cultural studies, and constitute the design focus of the research instrument. They will be answered in part III of the research, in which data from the interviews is analyzed.

Research questions

1. How do information-seeking professionals react when presented with choices of foreign language resources originating in cultures unfamiliar to them? Do researchers routinely examine retrieved web sites written in languages they do not read, or do they skip them as unusable or too much trouble?
2. What are the reasons information-seeking professionals give for choosing one resource over another among multicultural/multilingual possibilities? What clues do researchers look for in an online information resource "hit" when faced with, to them, incomprehensible text?
3. Are there similarities and differences apparent between the IS behavior of Egyptian and American searchers?
4. Do other cultural factors, such as education, work experience, linguistic training, ethnic background, family, travel experience, or gender, influence IS behavior in a cross-cultural information environment?
5. Is a difference in user performance discernable that can be attributed to cultural subgroup influence?
6. If researching scholars want information across languages and cultures, do they know how to access such information? Can they use multilingual resources to enhance search performance?

Related research

Need for a new research model

Lessons from related research strongly suggest the need to create innovative tools used in cross-cultural studies. In constructing a combined methodology specifically aimed at addressing the research questions listed above, research directions were derived from the disciplines of cultural anthropology; cross-cultural psychology; cross-cultural IS behavior; cross-cultural interface, web site, and digital library design; library online catalog usage; anthropological linguistics; and foreign language anxiety studies.

Culture and cross-culture

The relationship between culture and personality has been studied by anthropologists and psychologists since the late 1920s. Culture as a concept is difficult to pin down, and cross-cultural, interdisciplinary studies are even more complicated. A precise idea of what one means by culture is needed if one intends to isolate cultural universals and differences. [Callahan](#) (2005) gives a good overview of the discussions relating to culture and provides a useful working definition: "culture can be understood as a complex construct encapsulating shared values, group behavioral patterns, mental models, and communication styles." These components describe human attributes, and therefore must be seen as dynamic in nature. By the 1950s, "a cross-cultural comparative approach was introduced into the 'Culture and Personality' school by Whiting, using the Human Relations Area Files (HRAF)" ([Kağıtçıbaşı](#), 1996). In cross-cultural psychology, the most important distinction between cultures is the different relational conceptualizations of self. The self in some cultures (mainly in the West) is seen as a self-contained, independent individual, whereas in much of the rest of the world the emphasis is on a relational, collectivist oriented self with more fluid boundaries.

Cultural anthropology

The fundamental distinction in conceptualizations of self continues to play a role in the current literature of cross-cultural communication and anthropology. [Hall](#) (1990) and [Hofstede](#) (1997) are seminal thinkers in this field. The thrust of their work isolates cultural dimensions that are used to categorize and differentiate various cultures. Hall created the six dimensions of space, message velocity continuum, context, time concept, information flow, and action chains. Hofstede's five-dimensional model includes short-term vs. long-term orientation, power distance, collectivism/individualism, femininity/masculinity, and uncertainty avoidance. Hofstede's work is based on broad national characteristics, the data for which was collected from fifty international subsidiaries of IBM between 1967 and 1973.

There is rigorous questioning taking place of the theoretical basis of these cross-cultural concepts. [Jacob](#) (2005) criticizes them for their over-extended, global sweep approach, stating that "the grand typologies of [Hofstede](#) . . . may now have outlived their utility." She recommends a more robust methodology that uses various levels of analysis and different approaches supported by case-studies. This is similar to questions from the Digital Libraries across Cultures workshop: "What methods are best to use to study cross-cultural differences in information seeking? Methodological issues: combined approach of quantitative and qualitative methods; asking the appropriate questions to determine a user's cultural belonging, etc." ([Caidi & Komlodi](#), 2003).

[Jacob](#) (2005) also outlines two emerging cross-cultural theoretical frameworks, crossvergence (related to hybridization), and multiculturalism. Crossvergence merges practices from different cultures into new management systems specific to individual projects, thus avoiding lumping everyone in a nation into monolithic groups that disregard the dynamic nature of culture. Multiculturalism has to do with subgroups within nations and cultural heterogeneity. The object of both concepts is to shore up the weaknesses in cross-cultural constructs that oversimplify the role of individuals and approach culture as a static snapshot of countries or regions rather than as a dynamic representation of human beings transforming and being transformed by society.

Cross-cultural IS behavior

In spite of structural shortcomings, existing cross-cultural theories are being widely applied in spirited research projects in many fields. [Komlodi and Carlin](#) (2004), for

instance, use [Hall's](#) and [Hofstede's](#) cultural dimensions to address issues of cross-cultural IS behavior. Oard (1997) calls for "a comprehensive exposition of the user needs that motivate all of this [CLIR] activity." [Komlodi and Carlin](#) (2004) echo Oard when they state that "There is a long tradition of studying user IS behavior in electronic environments, however, the study of the impact of end-user national culture on the use of information systems to find, retrieve, and use information is very limited." They construct a table wherein nine of the eleven cultural dimensions created by [Hall](#) and [Hofstede](#) are ranked according to each dimension's probable impact on IS behavior.

Cross-cultural interface, web site, and digital library design

[Callahan](#) (2005) provides a detailed overview of work being done in cross-cultural interface design, and touches on a number of interesting issues. First, she answers the fundamental question of whether cultural factors matter with "a resounding 'yes.' The more important and harder question is which cultural differences matter most, and under what circumstances." It is clear that broad, general statements will not answer her question. She is careful to ground her work in existing cultural theories, while recognizing their weaknesses, and suggests accounting for other variables through multifactor studies, as do [Evers & Day](#), (1997). Cross-cultural researchers are urged to delineate membership in cultural (sub)-groups and provide some historical background on the cultures studied. She cautions about the inherent limitations of this type of work, mentioning methodological issues in cross-cultural studies, including non-homogeneity, the dynamic nature of culture, complexity, and various forms of bias, including research bias.

On another level, certain cultures exert strong influences on others via the Web, possibly causing web users to perceive them as a threat to their cultural sovereignty. Although this has obvious implications for Egyptians and other cultures whose native language is not English, it may also play a role in some Americans' attitude towards foreign language web sites. Also relevant to this study are [Callahan's](#) comments on the importance of language and translations as the most visible signs of culture on the Web. All material in a study with participants from different linguistic backgrounds must be available in all the language groups covered.

Human-computer interaction studies have considered issues of cross-cultural usability, and surveys from studies in cross-cultural web site design show that cultural differences are important to user performance. [Barber and Badre](#) (1998) discuss the merging of culture and usability into what they term "culturability," and suggest that the manipulation of cultural markers, custom made to fit various cultures when constructing web sites, would work better than trying to develop a generic global interface. Online library catalog IS behavior studies have thrown light on why participants act in certain ways when searching. Typified as the "I don't think I click" reaction, phenomena observed by [Novotny](#) (2004) explain some recurring observations in the present study. The "*Cross-Cultural Usability for Digital Libraries*" workshop at the *Joint Conference on Digital Libraries (JCDL)'03* typified their users as "often just as international as those of globally marketed software products or Web sites" ([Caidi & Komlodi](#), 2003). In the report of the outcomes of that workshop a call was made for comparative behavior studies of culturally diverse users of information resources.

Anthropological linguistics

Work done on the empirical universals of language can be used as an analytical tool to differentiate cultural attributes. Numerous scholars have undertaken empirical investigations, isolating conceptual universals in long-term studies across many languages and domains ([Wierzbicka](#), 2005). These concepts provide a framework for cross-cultural comparisons that go beyond the accepted models described in "dimensions"

conceptualizations, thus enabling analysis of standardized elements embedded in statements of individuals from different cultures.

Foreign language anxiety

Information seekers react in a number of ways when a search returns resources in languages unfamiliar to them. Foreign language anxiety studies are useful in explanation of these behavior patterns, especially those studies that specifically target anxiety that occurs when reading foreign language texts. It has been shown that reading in a foreign language provokes anxiety in some students, and that foreign language reading anxiety is different from foreign language anxiety linked with oral performance ([Saito et al.](#), 1999). The lessons learned from these studies, set in educational environments, can give insights into the cross-cultural IS process. In tracing the roots of this anxiety, it should be noted that *first* language reading difficulties are also well-known in educational literature. The role of background and cultural knowledge in foreign language anxiety studies needs exploring, and interviews will be useful in determining why people react the way they do, and how anxiety intervenes in the process ([Saito et al.](#), 1999).

The cross-cultural research instrument

Guiding principles

The cross-cultural research model that emerges from these considerations consists of a hybrid methodology with a multi-tiered approach, allowing analysis from different perspectives. The interview model records the following data:

- quantitative data that can be analyzed to describe how researchers react to certain choices. This data also provides evidence of elements described in existing theories of cultural dimensions, and enables assessment of their validity
- qualitative data that records recurring themes that participants express in answer to the question of "why" they behave in certain ways. This data also supplies a source of statements that can be analyzed using empirical universals of language
- observation of emotional behavior that may be a sign of foreign language anxiety
- cultural background information that may influence sub-group behavior

The interview model is constructed to supply clear instructions in all languages of the interviewees, observe cultural details that minimize interviewer bias, and alert the interviewer to evidence of culturally dynamic changes occurring in individual user profiles. In addition, an information literacy component is built into the model at the end of the process to provide instruction in retrieval and management of foreign language resources.

Interview model

Participants: Reference librarians were selected as participants because they are research professionals, and because they form a recognizable, literate sub-group with comparable educational and work background. During the month of November, 2005, the author, funded by a grant from the Office of International Research, Education, & Development of Virginia Tech, traveled through Egypt, visiting the Library of Alexandria, the Library of El-Zagazig University, the Greater Cairo Public Library, the Cairo University Library, the Library of the American University of Cairo, the Mubarak Public Library, the Egyptian National Scientific and Technical Information Network (ESTINET), and the Cairo branch of the Library of Congress. Upon his return to the USA, the author interviewed at San Antonio Public Library and Trinity University Library in Texas, and the University

Libraries of Virginia Tech, the Radford University Library, and the Blacksburg High School Library in Virginia.

Introduction to the interview: The interviewer explains to participants that the study is designed to observe the IS behavior of research professionals, in this case reference librarians and staff from Egypt and the USA. No names are recorded in the interview data, and the research project has been granted an exempt approval by the Institutional Review Board (IRB) of Virginia Tech. A copy of the IRB report is given to library directors when setting up the interviews. All interview material is explained verbally in either Arabic or English, printed in both languages in order to avoid misunderstandings, and prepared by native speakers. Interviews usually last about an hour.

Procedural instructions: Participants are asked to act as if they are searching for information on the Internet and in online databases in a simulation of their day-to-day procedures with students, faculty, or other patrons. The interviewer explains that a topic page will be used to clarify each topic, as if patrons have come to the reference desk with topics written down on a piece of paper. After introducing each topic, participants are given the results of an Internet search, not actually on the computer, but on computer generated, printed "hits" lists, from which they are asked to choose which resources to click and pass on to their imagined patrons. In order to simulate a real reference interview in a busy library, librarians are informed that they are somewhat limited in the time they are allowed to peruse the hits lists. It is stressed at this point that the hits on the lists are not arranged in any order of relevance -on such a short list of five hits each resource is to be considered equal. It is also stressed that for each topic, the identity and characteristics of the user, the "know your patron" item of a typical Reference 101 course in library school, must be determined by the participants themselves. In this way, the interviewer minimizes his influence on participants' subsequent choices of reference materials to pass on to their simulated users. After the four hits lists, a few questions are asked to gather information for the delineation of cultural sub-groups. Comments and discussions are encouraged throughout the interview.

Topic pages: Four printed pages with clear, simple textual topics printed in large, bold fonts are presented one by one to the participants, explaining their imaginary patron's information needs. The topics are "ESL (English as a second language)," "Rice diseases," "Nanotechnology in Germany," and "Zhou Yu's Train (Chinese Movie)." In order to ensure that all participants understand the topic, each sheet is illustrated with pictures representing it. For example, the first topic page includes three photographs. The first is of a group of students gathered around a teacher, and the second and third are pictures of Big Ben in London and Central Park in New York City, suggesting possible venues suitable to enroll in ESL programs.

Resources Hits lists: Four photocopied lists of five Google hits each are constructed to simulate the look and feel of typical results from a returned search. The hits are kept simple, each consisting of the link at the top left corner, a "translate this page" button at the top right, descriptive material in the middle, and the URL at the bottom. For example, this is the fifth hit from the second topic, "rice disease:"

Missouri Rice Disease Control [Translate this page]

Description, control and management of diseases, with information on seed treatment and foliar fungicides.

<http://agebb.missouri.edu/rice/diseases.htm>

The four lists are composed of resources in several languages, arranged so that the lists become progressively more "foreign" in look, as follows:

#1. Topic: ESL (English as a Second Language)

1. English
2. Arabic
3. Russian
4. Korean
5. Italian

Design rationale: The first topic is tagged as the example, "practice" topic, and time is taken to point out that every hit has a link, a "translate this page" button, descriptive matter in the middle, and a URL at the bottom that goes to the same place as the link above it. This one is an "easy" choice, linguistically speaking, with an English hit at the top and an Arabic one in the second slot. Special attention is given here to the translate button, the interviewer reiterating that at any time a translation can be had for the asking. Participants are then asked to point to or tap the link they would click on the computer to select a resource for their patrons. At this point many of the participants wonder who their patron might be, and even if they do not, the interviewer reminds them that they themselves will need to imagine who the patron is. After choosing a resource and telling why they do so, the interviewer again points out to the participants that even though the English and Arabic hits are placed at the top of this list, the lists are not in any particular relevance ranking. Arrangement on the page is, however, important to the research design of the project.

#2. Topic: Rice diseases

1. French, with the first words *Afrique Science* in the link
2. German, with .ac.at in the URL and some Latin scientific terminology
3. Japanese, with .ac.jp in the URL and some English in the description
4. Spanish, with the acronyms USDA and ARS prominently displayed
5. English, with .edu in the URL

Design rationale: this page is designed with French and German listed at the top, on the assumption that they are two foreign languages that many Egyptians may be expected to have been more directly exposed to than Americans. Spanish, more commonly used in the USA, is placed near the bottom, with English, in order to see if there will be a pattern of choices along geographic lines of the two cultures of the study. The reference to Africa is prominently displayed in the expectation that Egyptians may be attracted to a resource referring to their own continent, while Americans will be less attracted to such a geographic tag. Latin was included in the German language resource description for librarians with scientific backgrounds, and the USDA (United States Dairy Association) and ARS (Agricultural Research Service) are included to test the attraction of well-known government agency acronyms. Japanese is inserted in the middle of the page to see if the foreign script will evoke avoidance, even though there is some English in the description. Finally, .ac and .edu tags in the URLs are included to measure the effect these well-known Internet academic elements have on user choices.

#3. Topic: Nanotechnology in Germany

1. German
2. Japanese, with some English in the description
3. Arabic, with some English in the description
4. German
5. German, with some English in the link and description

Design rationale: This specifically German topic's hits list offers no purely English resource available to click. Three of the five are in the German language, and four of the

five sites are .de sites (located in Germany). This is to test if participants, having no clear choice for an English resource, will try a machine translation of a hit that is emphatically German in origin. The first hit has a direct, "clean" URL, with www followed simply by nanotechnology.de. The Japanese hit has the English word "symposium," and the Arabic hit has "2006 - 5th International" displayed prominently, testing the reference power of the concepts of gatherings and recent dates on information seekers. The last link, the only German one that has some English, is a little off topic, with the words "Life Science Agency" in the link and "German sport school" in the description. This is designed to test the attraction of descriptive material in a language familiar to participants (English), in spite of the less relevant nature of the hit's content.

#4. Topic: "Zhou Yu's Train" (Chinese Movie)

1. Chinese, with the words "movies" and "Chinese" in the URL
2. Japanese
3. Korean
4. Greek, with the word "pathfinder" prominent (in larger font) in the URL
5. Russian, with the words "paradisegroup" and "movies" in the URL

Design rationale: This is the last of the lists, and linguistically speaking, the most difficult, as all are non-roman scripts. Few of the participants find choices that look familiar or readable. Of interest here is, faced with five unknown scripts in the links and descriptions, what information in the URLs, which are always in roman script, will motivate researchers to choose them? This page causes discomfort to some participants, and the interviewer is prepared to quickly suggest the translate button when people seem to be out of ideas.

Information literacy instruction: Many participants are frustrated with the last hits list, as it only offers resources that are, to almost all of them, in unreadable scripts. The sixth research question is, "If researching scholars want information across languages and cultures, do they know how to access such information?" By the last hit list the answer to this question is clear: some do, most do not. Their professionalism makes them curious about how they might deal with such a situation if it comes up in their work, so a short section is included to provide instruction. In this way, the interviewer is able, at the end of the interview, to facilitate a small increase in the productivity of participants when they need to engage in IS behavior across cultures and languages. Instruction is given on how to navigate foreign language sites, search strategies across languages, ways to recognize web elements in foreign scripts, and the workings and locations of Internet machine translation engines.

Questionnaire: After completion of the hits lists, the interviews end with a questionnaire covering cultural affiliation and background information. The following cultural variables are included: education, work experience, languages spoken, gender, foreign travel, and family members or friends living abroad. This differentiation into multicultural sub-groups and individual typologies will assist in dealing with some known complexities of culture and provide further possibilities for in-depth analysis.

Application of the data

In part III of this study data derived from the interviews will be analyzed in order to provide a multi-perspective analysis of issues that emerge from the study. The results of quantitative graphs will be compared and contrasted, and tested against the cross-cultural tables constructed by [Komlodi and Carlin](#) (2004). Recurring themes will be compared between the cultures and analyzed using the linguistic tools derived from [Wierzbicka's](#) related research on empirical universals of language. These qualitative themes will also bring to light concepts that can be applied across the data to confirm or call into question

quantitative findings. Both data sets will be compared to salient cultural aspects emerging from part II's overview of Islamic book and information culture.

Discussion

This research instrument is designed to examine how researchers react when confronted with foreign language resources, how they view the prospect of having access to such information, what they need to improve user performance, and if cultural differences or similarities affect them in their work. The basic instrument of the research consists of a multi-leveled interview process in which quantitative and qualitative data is collected. The quantitative data is derived from three sources. First, a record is kept of which resources are chosen from various multilingual hits from four lists of search results. Second, observations are made of which parts of the hits are being clicked on for clues as to suitability. Third, in order to distinguish cultural subgroups, some cultural variables are surveyed. Qualitative data is derived from conversations during the interview, comments about observations of participants' reactions to hits lists, and the spoken responses to the question "why did you choose this resource?"

The interview model may be criticized for not being administered on a computer. "Clicks" are recorded by the interviewer observing the spot on the hits lists where participants point. The lists are made on the computer from actual search results, and then printed. The web sites where the resources are found and all translations are printed and made ready for instant participant access as well. The choice was made to use paper because not all of the reference rooms visited had computers. In interviewing reference librarians in these situations, it was felt that the results would be more valid if a medium were used with which all participants feel comfortable. On the other hand, one of the requirements to participate was that a reference librarian had to have some computer experience, so the search results format was readily recognized and accepted. Another possible criticism of the interview model was that it was necessary to work from topic pages without real patrons. The request to imagine a user needing reference help was good naturedly accepted, but it nevertheless proved difficult for some participants, who were trained to take clues about the information needs of actual persons sitting in front of them.

Collecting and analyzing data alone would be insufficient without background knowledge of the cultures under examination. As Robert Hillenbrand states in his introduction to Johannes Pedersen's *The Arabic Book* (Pedersen, 1984), "The world of books was very different in the two cultures." We have seen that the inherent complexity of cross-cultural interdisciplinary work necessitates a multi-leveled approach. The usefulness of providing historical background knowledge of the individual cultures is noted by several cross-cultural investigators (Callahan, 2005; Jacob, 2005). This can be narrowed down to a specific aspect of the culture, in this case the history of Islamic book culture, including literacy issues and modern information dissemination practices. It is beyond the scope of the present research to offer a comprehensive review of both the Egyptian and American information cultures, but it will be useful, especially for readers in the West less familiar with Islamic history, to provide a perspective in the form of an overview of Islamic book and information culture, which is the subject of part II of this research.

Conclusions

Cross-language information resource retrieval programs and machine translation engines are becoming more intelligent, using millions of pages -instantly accessible online- to contextualize their search results. The Internet is thus enabling a process of global cross-pollination of ideas. While administering the interviews in areas distant from each other, the author noticed that the convergence of masses of users from different localities, searching for information on the World Wide Web, has the effect of churning users

together in an evolving interaction. A useful next step might be to study a phenomenon that could be described as an international cultural information dynamic. This dynamic consists of a mix of ethno-cultural groups, sub-groups, and individuals, contributing collectively -in ways unique to their distinct cultures- to the construction of an international system of user interfaces, resources, and other information facilities. In contrast to the forced homogenization of generic global interface efforts, this amalgamation of the requirements of many cultures can be seen as a natural part of the evolution of the information infrastructure.

Anthropologists have long pondered the question of whether thinking varies with language. Recent research has proved that it does: "because languages vary, thinking varies too -a point studied in NSM [natural semantic metalanguage] research through detailed semantic investigation of numerous culture-specific concepts across a wide range of languages and semantic domains, including emotions, speech acts, moral concepts, values, cultural norms, and many others" (Wierzbicka, 2005). While English speakers will now have the option to tap into other cultural modes of expression, the other side of this coin is equally noteworthy. Large segments of the world population, unable or unwilling to master the English language, are being set free from *lingua franca* illiteracy. Taken together, this opens to a vast public an even vaster library of information.

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