

Multicultural Information Dynamics

“My eyes! If something is written in English or Arabic, they get it. Chinese? NO.”
–Egyptian reference librarian

“Oh! This is in German. This isn’t going to help.”
–American reference librarian

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Abstract

This is the third article in an exploratory cross-cultural research series analyzing the information seeking behavior of a group of eighty-four academic and public reference librarians from Egypt and the USA. This paper compares and analyses, on two levels, how the librarians reacted when required to choose information web sites in different languages. First, participants are compared by their Egyptian and American cultural backgrounds, after which they are mixed together and regrouped by their monolingual and multilingual language skills.

The Internet is enabling a process of global cross-pollination of ideas wherein language barriers to accessing multicultural thought are being reduced by online translations of content and instantaneous translation engines, and this forms the premise for this research. The principal question to be addressed here is whether users are crossing cultural lines at the basic level of retrieved Internet information hits.

Findings of the research show they are not. Two of three clicks were on the native languages (Arabic or English) of the participants, or on the *lingua franca* (English), when available. In contrast, when asked why they chose those sites, only one in three responses were language-related. When given choices in non-native language/non-*lingua franca* web sites only, the librarians utilized more machine translations of foreign language hits than original websites. Findings further show that Egyptian multilingual librarians clicked more machine translations than their monolingual colleagues or the American participants. Egyptians gave language-related reasons for clicking more often than Americans, while Americans mentioned professional considerations more. On the other hand, monolingual participants cited language reasons for choosing certain sites significantly more often than multilinguals, while the latter gave reasons based on professional themes more often than their monolingual librarian colleagues. Confronted with languages in scripts unknown to all of the participants, both the Egyptians and the Americans most often chose links they perceived to be related culturally and/or geographically to the topic. Egyptian multilingual librarians gave cultural or geographical

reasons for choosing hits in unfamiliar scripts twice as often as their monolingual colleagues. More Americans than Egyptians exhibited foreign language anxiety when given choices in relatively unfamiliar foreign languages, but when faced with language choices in scripts totally unknown to all participants, both the Egyptians and the Americans exhibited anxiety equally often. More monolinguals than multilinguals from both cultures exhibited foreign language anxiety when given choices in unfamiliar foreign languages and scripts.

The similarities and differences made clear in the findings have implications for improving search performance in the fields of global knowledge dissemination via web site and search engine design, library science, and multilingual scholarship.

Introduction

Egyptians are at the crossroads of many cultures, and it is natural that many speak several languages. In November of 2005, I travelled to Egypt to interview reference librarians to see how they react when an Internet search engine returns web sites to them in different languages. I wanted to compare how Egyptians and Americans react in the same situation, and I wondered if librarians would be a good choice of information-seeking professionals for a cross-cultural study.

When I returned to Virginia, I found that the American librarians I interviewed know more languages than I expected. They certainly have not studied as many as the Egyptians, but, given the cultural domination of English in North America, I was impressed. Bravo, I thought, many librarians of both nationalities can get by in a foreign language, and some feel that languages are important enough to master two or more. I concluded that reference librarians are the experts I need for exploratory cross-cultural information seeking behavioral research. On reflection, I realized that they also constitute a good study group to take to another level, splitting them into subgroups for a comparative study of multilingualism on the Internet.

Earlier articles (Hover, 2006, 2007) focused on the research methodology employed in the study, gave an overview of related literature, and briefly introduced the history of Islamic book and information culture. The authors are in the process of writing another paper in the series analyzing in detail the data derived from the hits the 84 librarians clicked, and the reasons given for why they selected them. A summary of some of that data will serve to introduce the material in this paper, which will focus on the differences and similarities observable when the participants are divided into subgroups of monolingual and multilingual librarians.

Although from different, complex cultures, the 42 participants from each country are on common ground as librarians. This renders the study group diverse, with a number of shared experiences and characteristics. My questions to them were designed to coincide with a normal occurrence in their daily work flow: "Which of these five top-ranked links would be the best information resource for a student, faculty, or other library patron standing in front of your reference desk?" Would the librarians click on Google hits in

unfamiliar foreign languages? The answer was soon clear: no. Most of the participants did not, if they could avoid it, click an information web site they could not read.

Most of us have grown accustomed to mining information resources using search engines that employ Internet relevancy ranking algorithms, and we know that when one returns hundreds of hits, the top page is likely to retrieve pay dirt. But what if the top five hits are in Chinese, and one cannot even pinpoint where a sentence begins or ends? Widespread scholarly research has confirmed that people of different cultures think differently (Wierzbicka, 2005), and considering the history of science and the potential mind power of all the people who speak Chinese, one can be sure that a top ranked Chinese hit will contain information on a subject that is worth knowing. What are the chances one might discover a different way of looking at a question, something that seems to take an “odd” but ingenious approach? What if it sparks a moment of genius in a researcher’s mind simply because she or he never looked at it that way, and she or he synthesizes something totally new as a result? Trans-cultural migration of ideas has been a source of inspiration throughout history, crossing oceans and continents, mountains and deserts, perhaps taking centuries. But in our time, this process is electronic and thus instantaneous.

The interview procedure

Interviews were conducted for about an hour with each person. I asked the participants (all reference librarians with Internet searching experience) to click the electronic hits they would choose to give an imaginary reference patron in their library in order to assist them in their information needs. Four lists were used, each covering one topic, with five possible hits per list. I explained to each participant that they were allowed to click as many of the hits as they liked, and that corresponding website printouts would be given to them for inspection if they wished. They were also asked to simulate the busy workflow of their libraries, which increased the spontaneity of the results. The lists were constructed to look like typical Google results lists, but with more languages than might normally be encountered. Each hit had a link and a “Translate this page” link at the top, descriptive material in the middle, and a URL at the bottom. Translations were provided immediately on request. The lists were printed so that they could be used in all the libraries of the study. They were arranged so that they became progressively more “foreign” in look. The first list, for example, had an English hit in the number one slot, and an Arabic one second, and thus offered readily recognizable choices in the two mother-tongues of 82 of the 84 participants. Here is the fifth hit from the second list, which got the majority of clicks on that list:

5. 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 fourth list consisted of hits in five languages (Chinese, Japanese, Korean, Greek, and Russian), in scripts all unfamiliar to all of the participants. Here is the Chinese hit:

1. 周渔的火车 Zhou Yu's Train 影视在线---[Translate this page]

Muzi.com : 木子网(中文) : 影视在线 : 周渔的火车Zhou Yu's Train.

周渔的火车Zhou Yu's Train (2001). 更多剧照(15). 年代, 2001. 剧种, 爱情片.

地区, 中国. 演员, 巩俐 · 梁家辉 · 孙红雷. 导演, 孙周. Muzi.com
 周渔(巩俐饰)是一个美丽善良的女性
<http://movies.muzi.com/dm/chinese/108953.shtml>

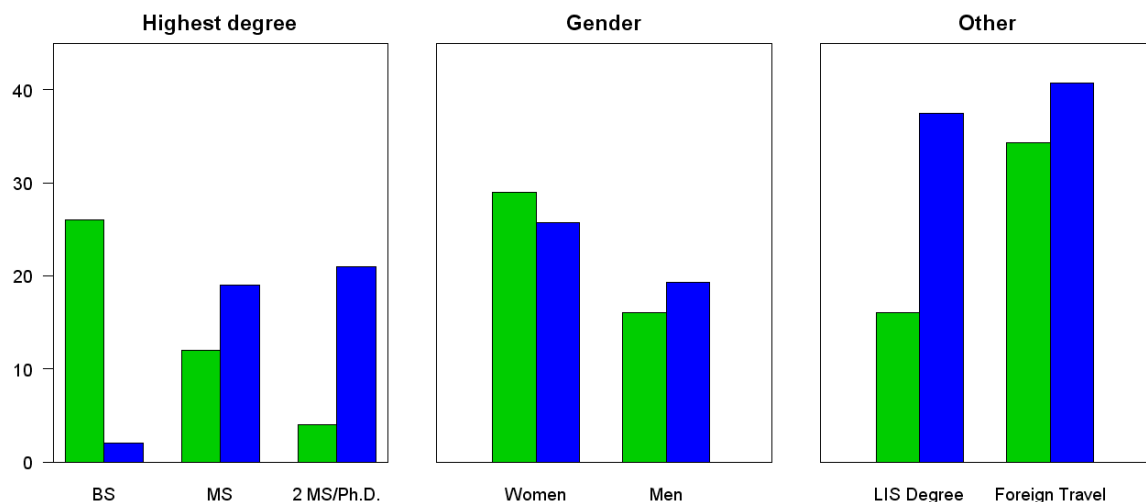
The author reiterated at the time of the presentation of each list that, since only the top five hits of a broad topic were on the page, the relevancy of the hits must be considered to be about equally important. In this way the librarians were alerted that there was useful information in all of the hits. The author recorded what hits the participants chose, asked why they chose them, and gathered other data from observations during the interviews. After the lists were completed, cultural background survey-type questions were asked, and a brief foreign language information literacy session rounded out the procedure.

Study group profiles

Education, gender, and foreign cultural exposure

It is important to acknowledge in a (cross-) cultural study such as this one that within the two groups themselves there is cultural diversity. For instance, participants were selected from various geographic areas of both countries, and include representatives of different national backgrounds (such as immigrants and dual-nationals). However, although not being characterized here as “homogenous cultural entities” (Jacob 2005), the two groups are largely distinct from one another as concerns ethnic and religious background, and may be said to be relatively representative of their respective cultures.

Chart 1, education, gender, LIS degrees, and foreign travel
 (Egyptians in green, Americans in blue)



As can be seen in Chart 1 above, all of the librarians are college educated. While the Egyptians are more extensively skilled in languages (Chart 2, below), the Americans have more graduate education. Given the respective economic and geographic environments, these variances were expected. Many have degrees focused on professional library skills, with more than half (49 of the 82) having majored in Library and Information Science (LIS). Both groups are similar in matters of foreign cultural exposure (travel and family members residing in foreign countries) and gender. Work

experience, not shown in the graphs, was also similar, with the Egyptians totaling 475 years of experience for the group, while the Americans tallied 514, for an average of 11 years 4 months and 12 years 3 months respectively.

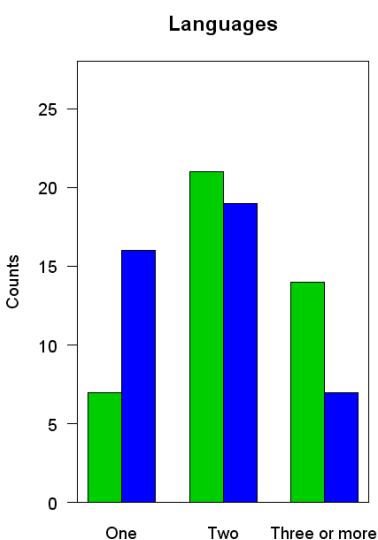
Languages: proficiency assessment

Experienced language instructors know that thorough testing is necessary to accurately measure language proficiency and predict one's ability to communicate. Although the interview format used here precludes such a detailed procedure, the author's own study and practical use of languages in several countries, combined with 25 years of teaching experience in both academic and business settings, makes possible a careful on-site assessment of proficiency sufficiently accurate to meet the needs of this exploratory research. Languages that participants reported having been exposed to briefly but never having used to a degree sufficient to enable them to read at more than an inconsequential level are not included in this study.

Languages: multilinguals and monolinguals

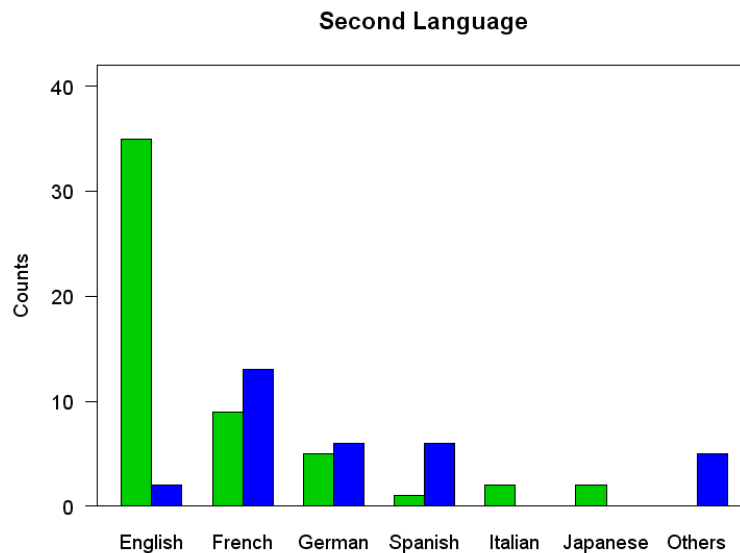
The results of the survey show in Chart 2 that there are 35 multilingual Egyptians, and 26 Americans, totaling about 73% of the participants.

Chart 2: Number of languages
(Egyptians in green, Americans in blue)



Of those, fourteen Egyptians have mastered three or more languages, compared to seven Americans. That leaves seven Egyptians who feel comfortable only in Arabic, and sixteen Americans who report themselves able to read only English. Another way to measure language ability of the groups is to look at the total times languages were mastered. The survey showed that the Egyptian librarians average 2.62 languages each as opposed to 1.98 for the Americans. Chart 3 below illustrates which languages were the main second languages of the participants:

Chart 3, Second languages
(Egyptians in green, Americans in blue)



A note on the working definition of multilingualism used in this study

The broadest definition of a multilingual person is anyone who can communicate in more than one language. Chart 3 shows the dominance of English among languages learned as a second language by the study group, especially among the Egyptians. The unique position of English as the modern world's *lingua franca* necessitates a working definition of multilingualism for this study. As it is our purpose to measure the differences and similarities in IS *behavior* of monolingual and multilingual participants, it will be helpful to explain what behavioral characteristics of multilingual persons are of interest to us. Perhaps the simplest description of what we are distinguishing in this study is a curiosity for and positive attitude to foreign languages and cultures, demonstrated by having learned one or two or more languages in addition to those required for day-to-day working and living. This will be indicative of the way a person approaches foreign language material. Thus, multilingual persons will be defined as those who are proficient in another language in addition to their native language plus the *lingua franca*, English.

Using this definition, although the majority of the Egyptian participants, in addition to speaking their native Arabic, speak English very well, only those Egyptians who also speak French, German, or another language will be included in the category "multilinguals." We were reluctant to use this method of categorization at first, because it seems to deny the existence of enthusiasm for foreign language learning on the part of multitudes of dedicated students of English around the globe. That is not our intention. After all, using English professionally involves intense and varied mastery, which may result in a more active or advanced form of bilingualism than merely knowing a language from several years of study in college and subsequently seldom using it. It follows that the Egyptians probably have a higher degree of language proficiency than the numbers above indicate. However, as 14 of the Egyptians are trilingual or better, and by our definition the 26 bilingual Americans would be classified multilingual, the resulting

group of 40 of the 84 librarians renders a sample of roughly half of the participants (48%), resulting in two well-balanced comparison groups. Of course, many Americans are required to study a language to pursue a professional degree, but that does not usually result in a high level of retention after graduation, so only those whose abilities were accessed as proficient are included in the multilingual category.

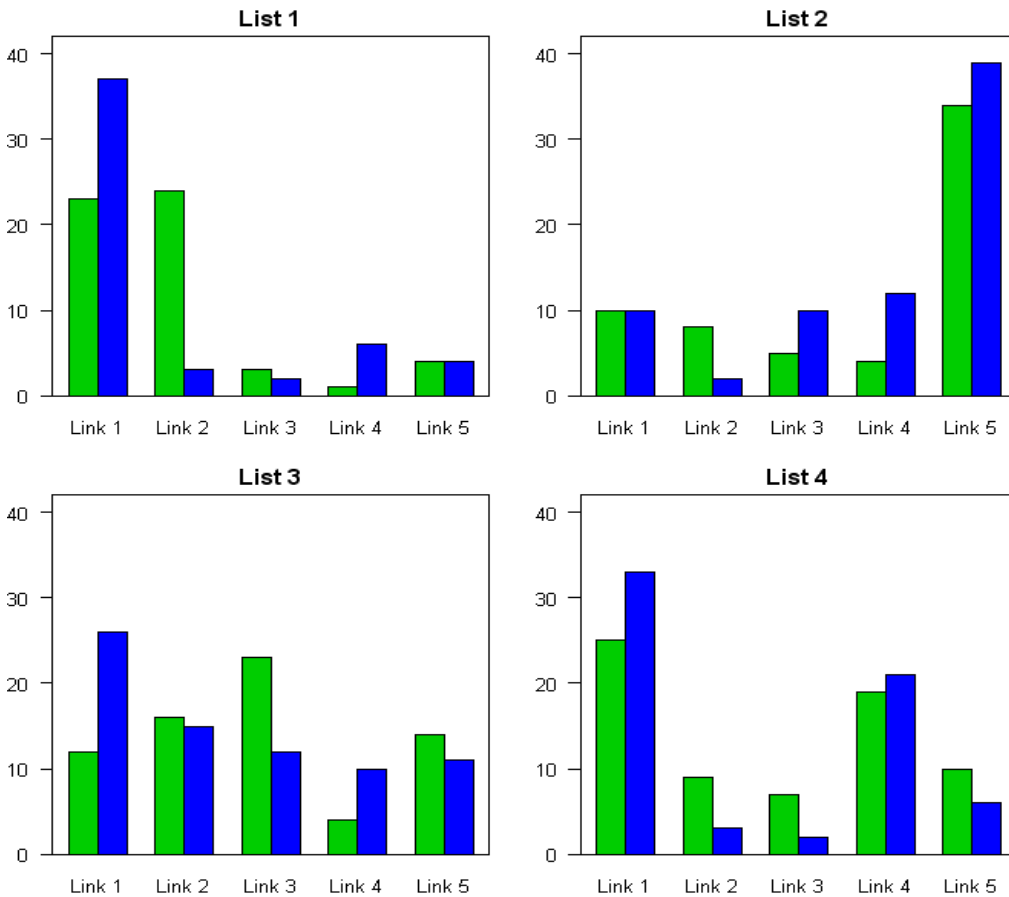
What the librarians clicked

Each topic list presented hits in 5 different languages (see Table 1 below). The four topics were “English as a Second Language (ESL)”, “Rice Diseases,” “Nanotechnology in Germany,” and “Jhou Yu’s Train (a Chinese movie).” Links to native language web sites are highlighted in bold and caps.

Table 1, Languages of the links on the topic lists

Topic Lists	Hit Link 1	Hit Link 2	Hit Link 3	Hit Link 4	Hit Link 5
List 1 “ESL”	ENGLISH	ARABIC	Russian	Korean	Italian
List 2 “Rice”	French	German	Japanese	Spanish	ENGLISH
List 3 “Nano”	German	Japanese	ARABIC	German	German
List 4 “Train”	Chinese	Japanese	Korean	Greek	Russian

Chart 4, Total hits on the topic lists
(Egyptians in green, Americans in blue)



Lists 1, 2, and 3 provided choices to the librarians to click on web sites in their native languages, which indeed they did, as is clearly visible in Chart 4 above. Clicks in lists 1, 2, and 3 are clustered around either native language sites (English and/or Arabic) or just English (*lingua franca*). If link 2 were stacked on link 1 (both native languages) on list 1, lists 1 and 2 would almost be mirror images. List 2 gives only an English native language site, and List 3 gives only an Arabic one. List 3, in contrast to the first two, provides no English alternative, so the Americans are forced to decide among foreign sites. The Egyptians chose their native language Arabic site most often on list 3, just as the Americans did the English hits on lists 1 and 2. Overall, about two out of three clicks landed on what some participants called their “comfort” languages, when available, despite repeated reminders of equal relevance of all the sites.

Analyzing List 1, for example, yields a clear preference for both cultures: 69% of the American clicks landed on the original of the English web site, as did 36% of the Egyptian clicks. Another 41 % of the Egyptian clicks were placed on the original Arabic document site, yielding a combined total for Egyptian clicks on the two primary languages of 77%. Combining the Egyptian hits on original English and Arabic resources with the American clicks on the same first two web site choices yields a preference from both groups of 73% of all clicks on the first hits list, i.e., on the native languages and/or *lingua franca* of the participants. This indicates a strong preference for the two languages most familiar to the participants, seemingly regardless of the probable informational value of the other web sites.

This percentage of actual click results is remarkably similar to survey percentages of users’ language preferences when surfing the web discussed by Callahan (2005):

Another survey conducted by IDC Project Atlas II asked users if they preferred to visit Web sites in English or in their native language (Josephson, 2002). Among Europeans, 52 percent preferred their native language over 23.3 percent in English (for the remaining 24.7 percent English was the native language). In Japan, the figures stand at 83.9 percent for Japanese and 7.7 percent for English, and the numbers for The People’s Republic of China are 84.9 percent and 14.8 percent... In Latin America, 76.3 percent preferred native language sites.

List 4 is the only one that gives neither English nor Arabic choices of hits, nor one in the Roman script, so the participants, linguistically speaking, could run, but they could not hide. They would have to take their best shot at 5 difficult targets. These web sites are so “foreign” they are uncomfortably daunting to some people. Still, after a short pause, most noticed that the URL, which is always in the roman script, was legible and offered clues. The majority of participants clicked the Chinese hit on List 4, giving as reason that the topic was culturally/geographically appropriate. The second largest bar on List 4 was due to a few English words in large, bold font embedded in the Greek text.

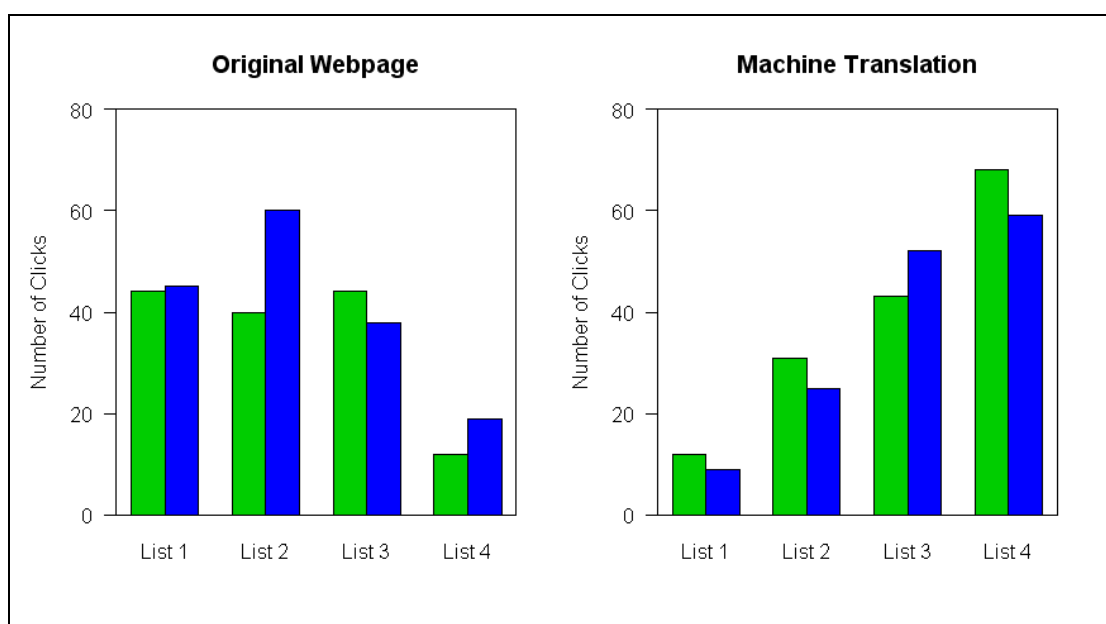
Original language web sites vs. machine translations

As every hit was provided with a “Translate this page” link, it was possible to track willingness to use machine translations for the foreign language choices. By the time

participants had worked through to List 4, most did not bother with the original websites, but went straight to the machine translation (see Chart 5 below).

There is no statistically significant difference in how often the American and Egyptian librarians clicked machine translations, i.e., they used them in a similar fashion. It is evident that as the lists become more “exotic” linguistically, the librarians used machine translation more often.

Chart 5, Original web sites vs. machine translations
(Egyptians in green, Americans in blue)



However, note that if only lists 1, 2, and 4 are considered, Egyptians appear to be more apt to try a machine translation, whereas the Americans seem to be more inclined to try the original on the same three lists, even though they speak fewer languages. It will be remembered that List 3 was the only list that offered an Arabic choice without an English one, which may explain why it shows the reverse pattern of the other three.

Non-native language (English or Arabic)/non-*lingua franca* (English) hits

We have demonstrated that the majority of clicks of the study group landed on the native language or *lingua franca* (English). The remaining clicks on non-native, non-English hits are instances of what we are especially interested in: cross-cultural choices. Although relatively rare, they are numerous enough to provide clues as to what motivates people to chance across linguistic lines.

Returning to a closer look at List 1, the remaining clicks of persons choosing Italian totaled a sizeable 7%. Even though only two of the librarians had studied Italian, all eight of them had studied at least one Romance language. As one person said, “It resembles French and I speak a little French.” This is a recurring cross-linguistic strategy: when

faced with unfamiliar languages, one recognizes and makes decisions based on cognates that “look like” words known in one’s native or secondary languages.

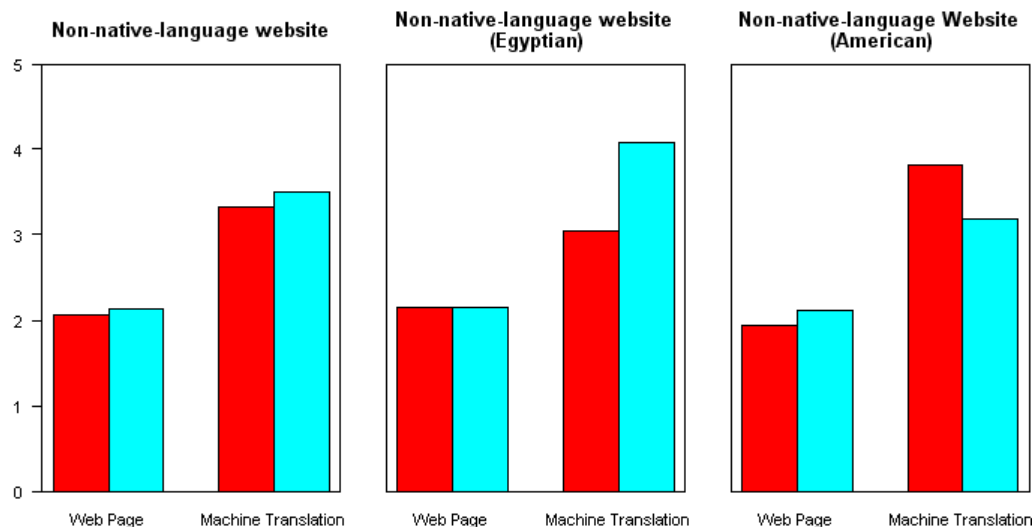
Although it got far fewer clicks than the native languages, the fourth language resource hit on List 1, in Korean, also had about 7% of total clicks. None of the participants could read Korean, but five of the seven persons clicking Korean said they were motivated by a photograph on the topic page that showed a group of East Asian students posed smiling around a western-looking teacher. Indeed, Korean was the only language from that region of the world presented in this hits list. This is an example of keying on graphics.

Lists one and four were also designed to see if enlarged fonts of foreign language hits would influence choices. On list one the fonts of the Russian and the Italian hits were more prominent, but the influence they exerted was not significant. Only two Egyptians cited the oversized acronym TOEFL, the test of English competency many of them had surely taken as students, in the descriptive material of the Italian hit. Only one participant mentioned the large font “learnenglish.com” in the Russian URL.

The remaining clicks on non-native languages were random. One participant reported clicking on the Russian “for the heck of it,” and two more used a “sweep” tactic for the last 3 hits on the page, asking for the machine translations of all the languages foreign to them. Most of those who clicked on non-native languages, fourteen of the sixteen persons, or 89%, are bi-lingual (by the traditional definition), compared to the average of 73% bilingualism for the entire group.

Chart 6 (below) illustrates that the participants preferred clicking machine translations of the web sites they could not read, although a sizable number nevertheless chose to explore the original foreign language site before opting for the translation.

**Chart 6, clicks on non-native language/non *lingua franca* hits:
original language web pages vs. machine translations**
(Monolinguals in red, multilinguals in light blue)



Across the charts there is no statistically significant difference in choices made by monolingual participants or multilinguals, but it is worthwhile to note that the Egyptian multilingual librarians seem to be more willing to chance a translation than their colleagues.

What motivated the librarians?

As the participants perused the hits lists, they made comments, suggestions, and asked questions. They also reacted enthusiastically, emotionally, quizzically, or reluctantly as the text of the hits lists became more and more “exotic,” i.e., presented more hits in languages and/or scripts unfamiliar to them. These verbal and behavioral instances were noted by the interviewer along with the answers given to the interviewer’s question: “Why did you choose this web site?” By the end of the research interviews, the author had identified fourteen recurring themes that can be grouped into the following four main categories: librarian professional considerations; languages related reasons; contents indications of relevancy; and random choosing, rejection of all choices, or dismissal as impossible. Here is an overview of the categories and themes, along with some comments made by the librarians:

Category 1: References to librarian professional methodology

- *Reference 101*: comments about reference interview issues typically taught in library schools, such as the requirement to determine who the patron is and what the level of the information requirement is, what type of library it is, what the focus of the requested topic is:
 - “I imagined the user is a student, so I chose general info.”
 - “May I ask your first language?”
 - “I need to know more on the specifics of the topic.”
- *Search methodologies*: criteria for choosing certain resources above others; processes of elimination; ranking resources as to relevance, interest, potential for further searching, and explanations of what the reference librarian would do in certain situations.
 - “I would use that as a link to further research.”
 - “I’d click on locations to find out if there were places closer to home.”
 - “If the patron wants in depth I would suggest that... he use the bibliography at the end.”

Category 2: Languages related reasons to choose

- *Language purely for language*: language choice only because it is the language of patron, the “comfort zone language.”
 - “Because it’s written in Arabic.”
 - “It’s in English, and frankly, that counts with me, because it’s my comfortable language.”
 - “Of course I’d go to my language first—if you are asking me a question, you want me to answer it!”
- *Exclusion based purely on linguistic grounds*:

- Throwing the list up in the air and declaring, “I can’t read that so it’s useless to me.”
- “How am I supposed to read these?”
- “I don’t understand [those languages] so I start by omitting those websites.”
- “Oh! This is written in German. This isn’t going to help.”
- “Number 2 also looks interesting but I didn’t choose it in the beginning because the script is in Japanese and that made me not notice that the source is useful.”
- *Language-culture-geographic perception link*: Subject is (about/from/in) X country, so chose X language; subject is X country, so not Y language; Country X does subject well, so choose X language; choosing most familiar language and asking for the translation; description/URL/link has English words in it so assume resource will contain some English or have an English link available.
 - “Subject is in Germany, so I choose a German website.”
 - “Because it’s a Chinese webpage, it will review many Chinese movies, and have information about stars. But using a Korean or Russian website, you will only get a little about Chinese movies.”
 - “Because China is a very large country.”
 - “The Japanese language didn’t bother me. The Japanese are known for their technology and would be experts and I’d like to know their take on it.”
- *Self-instruction in order to guide patron*:
 - “At first I chose [English] for myself, then I realized I should choose for my patron’s need—a foreigner who cannot speak English.”
 - “It’s not my field... so I need to know a little first, then I can expand and give my user more.”
 - “I understand this language, and if I am going to help someone, I need to know something about [the topic].”
- *English for science / French for science*:
 - “In engineering, everything is written in English, so I do not need other languages.”
 - “If it’s in science, then I want English!”

Category 3: Contents indications of relevancy

- *Contents clues (semantic)*: textual indicators; conference/symposium, dates (used to indicate either positive or negative relevancy); keying off cognates, i.e., reading an unknown language in Latin script and getting clues to the information:
 - “pathfinder;”
 - “too academic;”
 - “a dissertation, so there will be a bibliography;”
 - “Too commercial,” or “commercial database will have the information;”
 - “A symposium will be the most recent discoveries in the field.” “I avoided number 2, it’s a symposium.”
 - “Because of the phenylethenyl amide—it causes some diseases.”

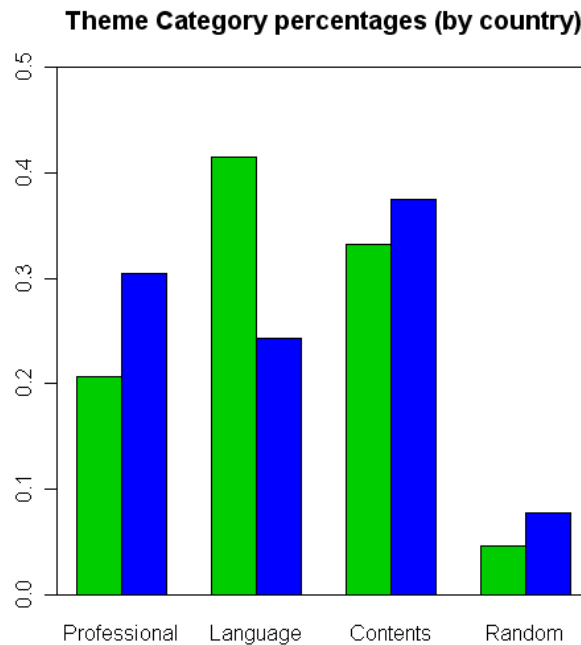
- *Contents clues (web technical)*: .com, .edu, .de, USDA, reliable source/unreliable source, trusted site/mistrust of the Internet as unreliable, database:
 - “Direct URL,”
 - “Simple URL has an authoritative look.”
 - “Because there is ‘.edu’ in the URL, so it is a trusted site.”
 - “The URL will tell me the right information.”
 - “The Internet is full of lies.”
- *Graphics*: Keying on pages with pictures illustrating the topics, which preceded the hits lists.
 - “I am very patron-oriented (pointing to the photograph of foreign students.”
 - “Judging from the picture, I’d choose number 4.”

Category 4: Choosing randomly, rejection of all choices, dismissal as impossible

- *Outright rejection*:
 - “It’s all equal!”
 - “Another search!”
 - “I don’t have a choice.”
 - “I wouldn’t choose any of them.”
- *Rejection of machine translation (MT)*: from negative experience in the past; technical problems with downloading MT software or site; reluctance to spend time waiting for the translation to be completed; hit the original language web page to look for clues or try to find an English linking button.
 - “Oh that’s terrible—translated by a machine!”
 - “My 3 languages cover it [English, French and Arabic], no need to translate usually.”
 - “Can’t make heads or tails of it!”
- *Choosing the first hit regardless*: limited time, mistaken ranking assumption, seeking an English link.
 - “I have no idea—I’ll start at the top and work down!”
 - “Since it’s the first one that comes up—relying on ranking system.”
 - “What I am looking for is this! [pointing to an English language link]”
- *Random*:
 - “Any hit is ok!”
 - “This one really is just a guessing game!”
 - “By luck!”

The rates of the reasons given for clicking web sites in the four categories listed above are summarized in chart 7 below:

Chart 7, Why the librarians chose certain web sites
(Egyptians in green, Americans in blue)



Graph 7 shows that the Americans mentioned professional considerations (Category 1) more often as they made decisions, which may be attributable to their higher level of education generally and more degrees in library and information science specifically. The Egyptian librarians gave more language-related reasons (Category 2) for choosing between multilingual web sites, which likewise corresponds to the survey data which shows that the Egyptians have more experience with and mastery of languages. A Chi-square test ($p\text{-value} < 0.01$) confirms that the considerations of themes are significantly different between the two cultures.

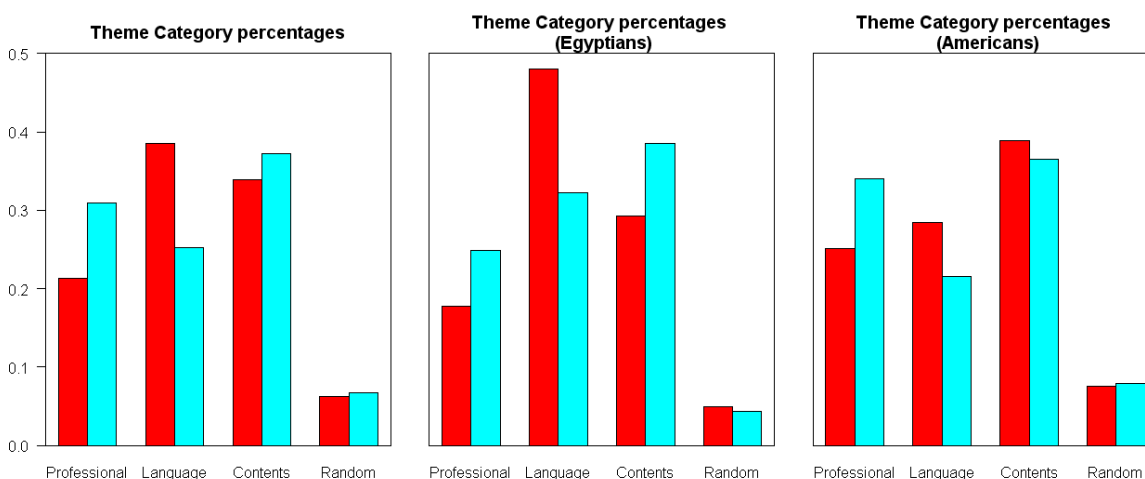
Both groups relied heavily on contents clues (Category 3) in equal proportions. A breakdown of the types of clues mentioned by the librarians reveals that semantic clues were much more operative than web-technical clues, which seems at first anti-intuitive given the technological nature of the medium. Our data thus indicate that, at least for our study group, natural language informs the human mind before technology. Twice as many references to web-technical concerns were given by Americans, however, which may be attributable to the longer history of exposure to Internet and computer technology in the USA. In contrast, many library reference rooms in Egypt still need computers, relying on print alone for many of their student assistance endeavors.

Americans were more apt to reject all sites or choose a random web site (Category 4) when faced with foreign scripts incomprehensible to them, but there were not enough instances to be statistically significant.

Monolingual and multilingual participants report different reasons for clicking

There are also differences in the reasons the participants gave for choosing websites when split into groups of monolinguals and multilinguals. These differences are consistently clustered around the same two categories as the cultural groups, namely the professional and language-related categories. Interestingly, the differences that are specific to Egyptians and Americans now cut across both cultures and partition into monolingual and multilingual divisions, as can be seen in Chart 8 below:

Chart 8, Reasons given for choosing hits
(monolinguals in red, multilinguals in light blue)

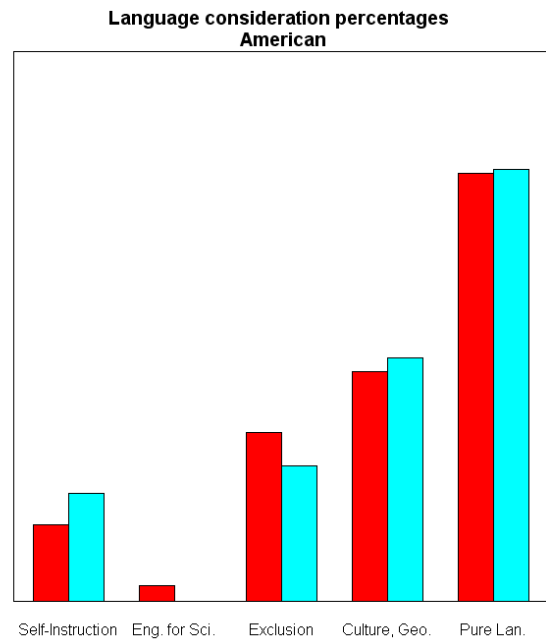
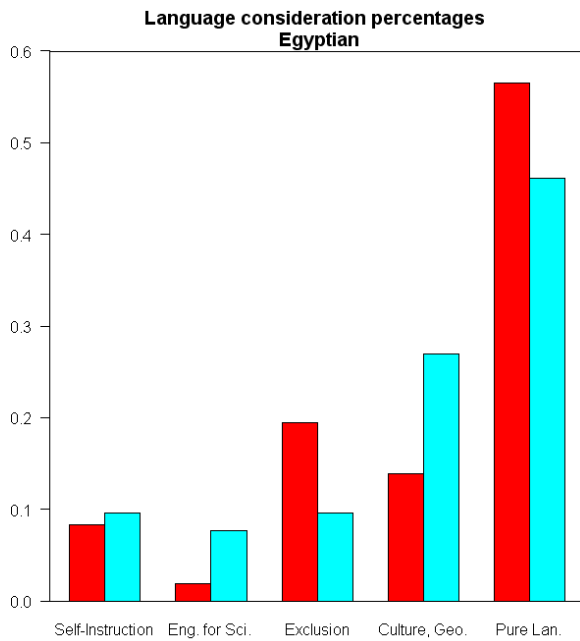
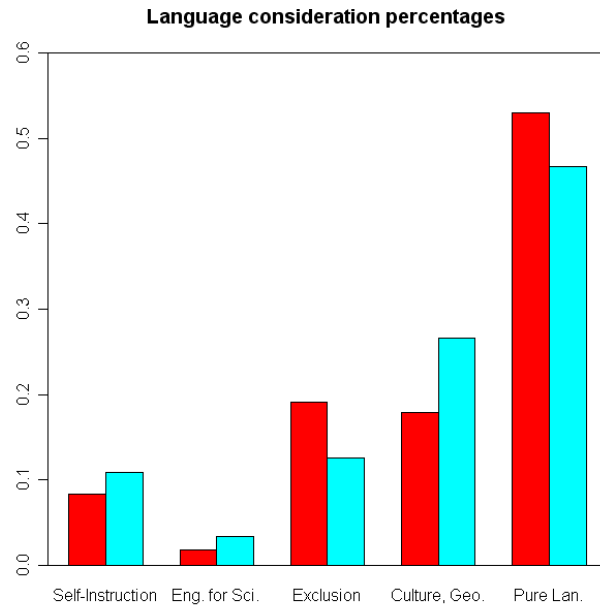


Statistical tests show that, for the entire study group, there is a significant difference (p -value < 0.001) between monolingual and multilingual librarians when giving reasons for choosing links. Multilingual participants related relying on professional considerations more often than their monolingual colleagues, while the latter reported choosing language-related reasons for clicking more often. Taking the nationalities individually, statistical tests show that for the Egyptians, the difference in monolingual and multilingual reasoning is also significant (p -value = 0.016). Furthermore, although between the American monolinguals and multilinguals the differences are not significant statistically (p -value = 0.117), Chart 8 indicates that there is a distinction, albeit less dramatic, along the same lines as the Egyptian contingent.

A closer look at Category 2: Languages-related reasons to choose

Of special interest to this report are details of the recurring issues that comprise Category 2. Chart 9 below makes it clear that in Category 2, Language-related reasons to click sites, the most often mentioned recurring theme is clicking purely for the language, i.e., choosing based only on the language of the site. The second most mentioned reason relates to cultural/geographic considerations.

Chart 9, Language considerations in detail
 (Monolinguals in red, multilinguals in light blue)



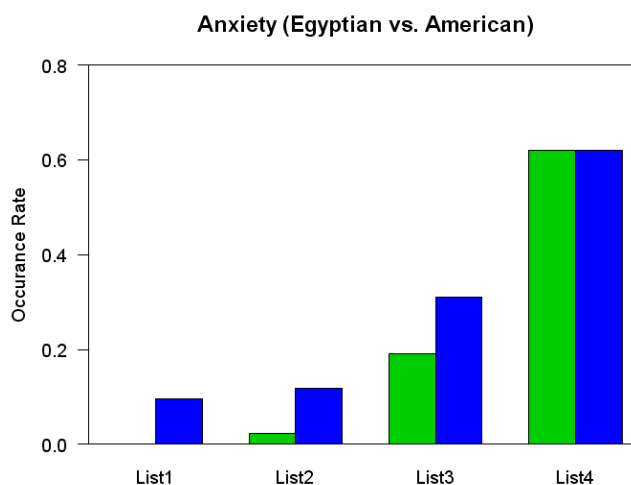
Note that even though statistically the differences between monolingual and multilingual participants are not significant within the language category itself, adding the “pure language” and the “exclusion” languages categories of the Egyptians yields a visible preponderance on the side of the monolinguals. This may be made clearer with a larger number of observations. Also of note is that the Egyptian multilinguals gave cultural/geographical reasons about twice as often as their monolingual colleagues.

Foreign Language Anxiety

As mentioned earlier, List 4 consisted of five hits in five different scripts, and all were unintelligible to the participants. This caused more consternation than the researchers expected. Uneasiness was palpable as the interviews progressed, and this applied to Egyptians and Americans, persons highly skilled in languages and those less linguistically experienced—it was across the board. An American librarian, bilingual in English and German, and knowledgeable in several other European languages, made a memorable comment when she laid eyes on List 4: “*Ach lieber Gott!* Once I find an English button... Boy! Will I click THERE!” It seems reasonable to expect that this librarian would be open to exploring a web page in a foreign script. She was immediately able to recognize correctly the languages of all five hits, itself revealing her wide-ranging experience with languages. She was not the only example of multilingual persons reacting anxiously to unintelligible text.

The anxiety took many forms, from subtle shrugs and sighs, shaking heads, whistles, and nods, to outright throwing the lists in the air, to laughing nervously. It started, at least on the part of the Americans, already with List 1 (see Chart 10 below). The Egyptians seemed less perturbed than the Americans in the earlier stages. When Lists 1, 2, and 3 are combined, Egyptian librarians showed a significantly lower rate of foreign language anxiety ($p\text{-value}=0.01068$). When List 4 was presented, on the other hand, an equal number in both groups (26 of the 42 participants) showed signs of anxiety. That’s 62% of the participants that reacted to the seeming “lack” of choices, i.e., lack of choices that did not make them feel illiterate!

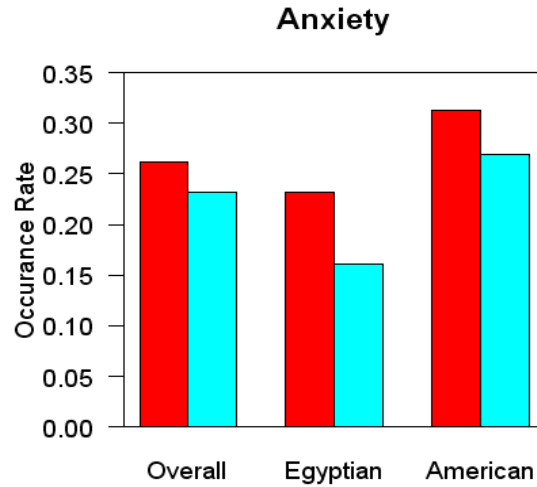
Chart 10, Foreign language anxiety
(Egyptians in green, Americans in blue)



Combining the lists and measuring reactions along multilingual and non-multilingual lines (Chart 11), we find that the difference in anxiety occurrence rates is not significant statistically, despite the fact that the graph shows that multilinguals consistently evince less anxiety, especially the Egyptians. This is due to low power of the statistical proof,

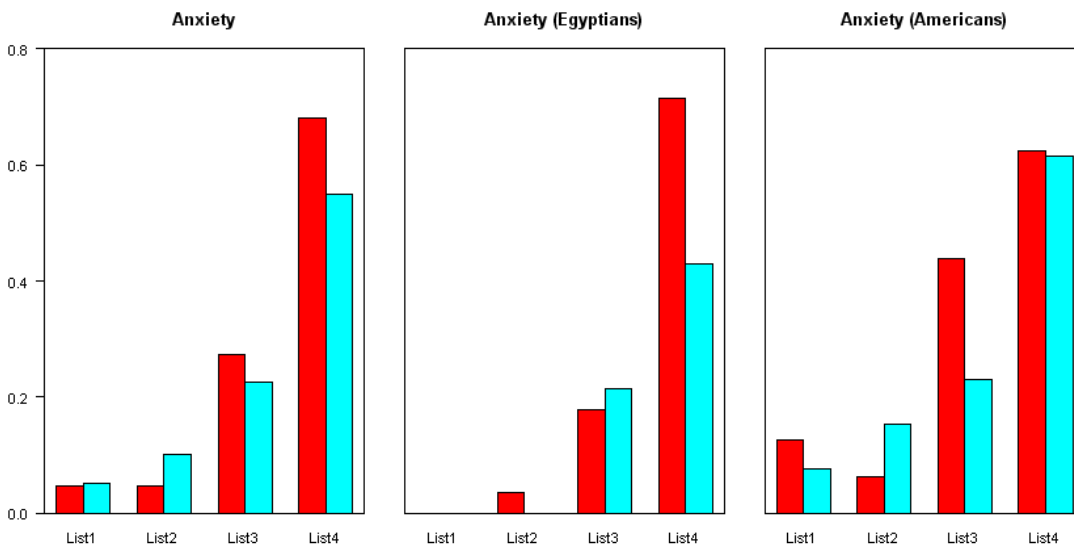
which is decided by total counts and anxiety counts. The authors would argue that with more observation, one might expect the pattern to show stronger.

Chart 11, Foreign language anxiety of all participants
(grouped by monolinguals in red and multilinguals in light blue)



However, statistically significant differences between monolingual and multilingual librarians surface when we break down the data by Lists in Chart 12, Detailed foreign language anxiety occurrences, below.

Chart 12, Detailed foreign language anxiety occurrences
(by monolinguals in red, multilinguals in light blue)



It is clear that when the librarians faced links in unfamiliar languages for the first time, their anxiety increased, in particular the monolinguals. Lists 1 and 2 have English and/or Arabic choices, so all groups show low occurrences of anxiety. List 3 has Arabic but no English, so the Egyptians stay relatively cool, but Americans, especially monolinguals (p -value=0.08), reacted significantly. As seen earlier in this paper, List 4 caused the most anxiety in both cultural groups equally, but caused significantly more anxiety among the monolingual Egyptians (p -value=0.04) than their multilingual compatriots. It was the first list on which they could find no English or Arabic hits. The jump in List 4 is statistically similar between monolingual and multilingual Americans, and is harsh.

Findings

1. **Native language and *lingua franca* preference:** Overall, when participants were choosing among search results in several languages on the Internet, about two thirds of all clicks were on hits in their native languages or English, when available. In contrast, only about one in three responses to the question “Why did you click this web site?” were language-related.
2. **Machine translations:** When given no other choice than non-native language/non-*lingua franca* web sites, all the participants preferred to click machine translations of foreign language hits rather than the foreign language websites themselves. Egyptian multilingual librarians clicked more machine translations than their monolingual colleagues or the American participants.
3. **Language-related vs. professional considerations-related reasons for clicking:** Egyptians gave language-related reasons for clicking more often than Americans, while Americans mentioned professional reasons more often. Monolinguals cited language reasons for choosing sites significantly more often than multilingual participants, while multilinguals gave reasons based on professional themes more often than monolinguals.
4. **Unknown scripts:** Confronted with languages in scripts unknown to all of the participants, both the Egyptians and the Americans most often chose links they perceived to be related culturally and/or geographically to the topic. As a group, multilingual and monolingual participants were also similar, although Egyptian multilingual librarians gave cultural/geographical reasons for choosing hits in unfamiliar scripts twice as often as their monolingual compatriots.
5. **Language anxiety:** Overall, more Americans than Egyptians exhibited language anxiety when given lists with choices in foreign languages unfamiliar to most participants. In contrast, when faced with language choices in scripts unknown to all participants, both groups exhibited anxiety equally often. Overall, graphs consistently indicate that more monolinguals than multilinguals exhibited language anxiety when given choices in unfamiliar foreign languages. When separated by culture, however, the American monolingual participants exhibited significantly more anxiety than their multilingual countrymen when first faced with a list of hits without an English choice. Similarly, monolingual Egyptians

had significantly more anxiety than their multilingual colleagues when faced with unknown scripts for the first time. When confronted with foreign language choices in scripts unknown to all participants, both multilingual and monolingual Americans evinced a high degree of anxiety equally often.

Discussion

At this stage of the study, we have generated more questions than answers. It has been shown that the participants in the study routinely ignored retrieved web sites written in languages they do not read. However, when forced to choose from languages foreign to them, they were willing to click on machine translations. Multilingual Egyptian librarians were confident in taking a chance on an online translation, more so than their monolingual colleagues or Americans. Are these evidences of cultural differences, and if so, which ones? Or are they educational in origin?

Once they had no other choice, the librarians were resourceful, scanning hits for clues in the URL and gleaning familiar words embedded in unfamiliar scripts. The reasons they gave were varied, but assignment of cultural and geographic associations played a large part in their decision making process. Knowledge of other cultures trumped enlarged, bold fonts.

It seems that people with more language training, the Egyptians, gave more language-related reasons for clicking than the Americans. The Americans, with more post-graduate and LIS degrees, gave more library professional-related reasons than the Egyptians. When arranged together in linguistic groups, the monolingual group as a whole gave language-related reasons more often than the multilinguals, and the latter relied more on professional motivations. Does being multilingual, like being well educated, free one from more basic communication considerations and allow more concentration on professional matters? If so, this will effect search performance.

Summarizing, the two cultural groups were different in the reasons they gave for choosing what they did and in foreign language anxiety. Was the heightened American anxiety a result of the linguistic isolation of the USA? If so, why were the two nationalities equally anxious when all of the hits were in scripts unfamiliar to all participants? The Egyptians and Americans were also similar in several ways. To more or less equal degrees, they avoided foreign hits, resorted to culture-based reasoning when all else failed, and expressed anxiety when faced with completely incomprehensible texts. The differences and similarities in the sub-cultural groups formed by the monolingual and multilingual participants follow a similar pattern. Multilingual persons of both cultural groups are less bothered about language and more concerned with professional considerations in a multilingual environment. The multilinguals also show less anxiety in the search process. Clearly, these two factors indicate an increased probability for improved search performance.

Implications

Improving search performance is the thrust of the study of multilingual user IS behavior. In the case of interface designers, for example, Callahan (2005) advises that “The

influence of design on user performance should be the main focus for studies of international interfaces... the number of non-English speaking users is steadily increasing as is the number of Web pages designed in languages other than English. This increase is so rapid that it is difficult to estimate.” Our research has implications for search performance in the fields of global knowledge dissemination via web site and search engine design, multilingual scholarship, and library science.

Our study confirms that information seekers across the two cultural groups click the most direct, fastest route to their perceived goal without concern for sites they cannot read. The implication for search engine, interface, and web site designers is to develop strategies to overcome the upfront refusal of most researchers to attempt to extract information from unfamiliar languages. Web site creators need to equip their site with fluent, high quality human translations of their main concepts and messages. Machine translations of entire sites can in turn take care of subsequent scanning for reasons of closer examination when the main conceptual framework has been successfully delivered and found to be interesting. Although machine translations are getting better, our research confirms an unbending residual resistance to them dating from clunky performance in the developing stages of the technology. Avoiding reactions by native speakers of distaste for a puerile machine translation product in their own language is important to convince them to click further.

Search engine and interface designers will do well to enable browsers to provide instant provision of multilingual choices. On non-English sites the high quality human translations into English or other target languages mentioned above should be available not at a click, for we have seen users avoid even one click on foreign texts, but before clicking, using a mouse-over. Systems should enable users to easily choose a language to have instantly delivered, in the mouse-over window, and if a human translation is unavailable, then machine translation should be employed automatically. Imperfect translation is better than incomprehension. On English sites the same applies, for the increasing numbers of non-English users are going to demand equal service. There will be no tolerance for forced *lingua franca* illiteracy, and where this is not acknowledged, information dissemination will take place elsewhere.

Across the cultural boundaries, the members of the group of multilingual users were remarkable in several ways:

1. Egyptian multilingual librarians clicked more machine translations than their monolingual colleagues or the American participants.
2. Multilinguals of both groups gave reasons based on professional themes more often than monolinguals.
3. Egyptian multilingual librarians gave cultural/geographical reasons for choosing hits in unfamiliar scripts twice as often as their monolingual compatriots.
4. Graphs indicate that multilinguals exhibited less foreign language anxiety than monolinguals. The American multilingual participants exhibited significantly less anxiety than their monolingual countrymen when first faced with a list of hits

without an English choice. Multilingual Egyptians had significantly less anxiety when initially faced with unknown scripts than their monolingual colleagues.

Note also that the subgroup Egyptian multilinguals, because of our working definition of multilingualism, have the highest developed language skills of the participants. Judging from our findings above, their performance appears to stand out in several ways.

We have thus put the phenomenon of avoidance of things foreign, confirmed as common to all participants, to the test. Given no way to avoid confronting resources in scripts utterly unknown to the entire study group, we found that multilingual users are bolder in their choices, less daunted by the unfamiliar, and more effective professionally.

For multilingual scholars and the librarians that assist them, the obvious implication is that there is no avoiding studying many languages if one is to excel in a multicultural environment, but this has been known for years. It also takes years. Less obvious is the added value of the cultural knowledge one acquires on the way while studying several languages, which allows a much more profound and insightful understanding of ideas originating in foreign cultures. In other words, technology will help, but there is nothing yet to match common sense human understanding of other human beings, and universities will do well to continue equipping their students with the language skills to compete globally. Using modern technology, librarians can assist in many ways to unlock ideas in formerly inaccessible foreign texts. While travelling in Egypt, I was urged time and again to report that there are thousands of students waiting for translations of scientific texts in exclusively English language databases. Opening such resources with technology already freely available would do much to advance global learning.

Conclusions

Global information dissemination is not something one can analyze with a simple set of clear-cut data. The librarians who were interviewed do not live in monolithic cultures. They share characteristics with their countrymen, and with their fellow librarians, but they are individuals, and pinning them down with qualitative and quantitative data was anything but easy. They were friendly and willing to help, and when asked which web site they would click, it was clear they had myriad motivations, only a few of which the interviewer was able to record. The object of this exploratory research was to test the possibilities of finding out how professional information seekers react to languages they cannot read, which we did, but something more disturbing emerges with the results of the data analysis.

Studying clicks and reasons for clicks, we looked for clues for how we should view rejection of valuable resources just because they were in languages unfamiliar to the participants. Is it merely a question of such languages being outside our “comfort zone?” The obvious conclusion that one does not choose information one cannot read because it will by definition not inform us, seems inadequate in the face of overt expressions of anxiety and persistent avoidance of foreign material. Many participants come right out and say they are choosing a web site only because they can read it: “Of course I’d go to my language first—if you’re asking me a question, you want me to answer it!” Many

others do exactly that, too, but explain their clicks with reasons unrelated to their actions. To the interviewer, this disconnect seemed largely unconscious and unintentional.

Regardless of the origins of this avoidance of things foreign, it is clearly a serious obstacle to optimum search performance. Is it truly comforting to remain within one's own language world, to talk about the sufficiency of one's own culture to cover all contingencies, all emerging concepts, and all advances in technological thought? Should we trust a thesis that tells us that foreign text will give us nothing we do not already know, that we are perfectly all right as we are? The result of that kind of thinking is that someone else will harvest emerging ideas from other cultures in the international knowledge environment. What is needed is some counterforce that will promote willingness to explore across linguistic and cultural borders, something that will appeal to a researcher's excitement for the hunt of the innovative, something that would underline the wasted opportunities entailed by the fear of humiliation for seeming—if only for a moment—illiterate.

The means to motivate researchers to cross cultures in search of solutions and inspiration may already be operative. There is a convergence of masses of users on the World Wide Web churning together in an interaction of ethno-cultural groups contributing collectively—in ways unique to their distinct cultures—to the development of what we term multicultural information dynamics. This amalgamation of the literacy requirements of many cultures is a natural part of the evolution of the information infrastructure. More research is needed to examine this phenomenon at the fundamental level of clicks across linguistic lines, asking what motivates seekers of information to move from site to site in an increasingly multilingual environment.

References

- Callahan, E. (2005). Interface design and culture. *Annual Review of Information Science and Technology* 39 257-310.
- Hover, P. L. (2006). Egyptian and American Internet-Based Cross-Cultural Information Seeking Behavior Part I: Research Instrument. *Webology*, 3(4), Article 31. Available at: <http://www.webology.ir/2006/v3n4/a31.html>
- Hover, Paul L. (2007). Islamic Book and Information Culture: An Overview. *Webology*, 4(1), Article 39. Available at: <http://www.webology.ir/2007/v4n1/a39.html>
- Jacob, N. (2005). Cross-cultural investigations: emerging concepts. *Journal of Organizational Change Management* 18(5): 514-528.
- Josephson, M. (2002). Globalization cost-out: How to reduce costs, improve quality, and launch multilingual Web sites faster. *Idiom Globalization Leadership Series*. Available at: <http://www.idiominc.com/us/solutions/gls.asp>

Wierzbicka, A. (2005). Empirical universals of language as a basis for the study of other human universals and as a tool for exploring cross-cultural differences. *Ethos* 33(2): 256-291