Shall I Google It or Ask the Competent Villain Down the Hall? The Moderating Role of Information Need in Information Source Selection

Li Lu
Annenberg School of Communication, University of Southern California, 3502 Watt Way, Los Angeles, CA 90089. E-mail: lvl219@gmail.com

Y. Connie Yuan
Department of Communication and Department of Information Science, 308 Kennedy Hall, Cornell University, Ithaca, NY 14853. E-mail: yy239@cornell.edu

Previous studies have found that both (a) the characteristics (e.g., quality and accessibility) (e.g., Fidel & Green, 2004) and (b) the types of sources (e.g., relational and nonrelational sources) (e.g., Zimmer, Henry, & Butler, 2007) influence information source selection. Different from earlier studies that have prioritized one source attribute over the other, this research uses information need as a contingency factor to examine information seekers' simultaneous consideration of different attributes. An empirical test from 149 employees' evaluations of eight information sources revealed that (a) low- and high-information-need individuals favored information source quality over accessibility while medium-information-need individuals favored accessibility over quality; and (b) individuals are more likely to choose relational over nonrelational sources as information need increases.

Introduction

Organizations are institutions replete with change, ambiguity, and uncertainty (Morrison & Vancouver, 2000). To cope with these issues, employees need to find and locate needed information and expertise in a timely manner (Fidel & Green, 2004; Kuhlthau, 1991; Massey & Montoya-Wei, 2006; Morrison, 2002; Vancouver & Morrison, 1995). While information source selection has been studied for decades, we believe that the topic is worthy of continued research attention because new developments in information technology can constantly reshape source characteristics, and the relative importance of these characteristics, in the landscape of information seeking. For instance, the rapid growths of the Internet and of Web 2.0 technology have made mass production and mass dissemination of information faster and easier than ever before. In a society in which a plethora of information sources exists, having too many choices is equally likely to cause delays in finding needed information than is having too few. The reason is that these different information sources usually do not have all the desirable characteristics. For instance, search engines can put useful information at the seeker’s fingertips, but such easily accessed information can have questionable quality when anyone can post to the Internet. Hence, how to select the information sources which have the best trade-off between potential benefits and the associated cost of attainment can be a real challenge (Gerstberger & Allen, 1968; Hertzum, 2002; Marton & Choo, 2002), particularly when people have limited time and cognitive resources with which to sift through these sources.

Extensive research has found that two characteristics of information sources i.e., quality and accessibility, have the largest impact on information source selection (Culnan, 1983; Fidel & Green, 2004; O’Reilly, 1982; Zimmer, Henry, & Butler, 2007). Accessibility refers to the ease with which information seekers can reach an information source to acquire information (Culnan, 1984; Zimmer et al., 2007). Quality refers to the relevance and specificity of the source to the problem being addressed, coupled with the accuracy, reliability, comprehensibility, and timeliness of that source (McKinney & Yoon, 2002; O’Reilly, 1982). Yet, studies on the relative importance of these two factors for information source selection have produced mixed results. While some studies have found that information seekers deem accessibility more important than quality in seekers’ source selection (e.g., Culnan, 1984; Hertzum & Pejtersen, 2000; O’Reilly, 1982), others have found just the opposite (e.g.,
Accessibility Versus Quality in Information Seeking: Mixed Results

In the late 1960s and early 1970s, research showed that accessibility is an important factor influencing information source selection (Allen, 1977; Gerstberger & Allen, 1968; Rosenberg, 1967). Numerous studies have shown a positive relationship between perceived accessibility and the selection of a particular source (e.g., Allen, 1977; Culnan, 1983; O’Reilly, 1982; Pinelli, Bishop, Barclay, & Kennedy, 1993). Among them, many actually have found that information seekers considered source accessibility a more important factor than was quality when selecting a source (Culnan, 1984; Hardy, 1982; O’Reilly, 1982, 1983). This finding has been well received in the research community because it is consistent with a well-accepted assumption in social cognition literature that people are “cognition misers” (Taylor & Fiske, 1978), and hence, they are not always motivated to expend the effort to systematically process incoming information. Applying the same logic to information source selection, individuals would tend to select those that require the least effort (Hertzum & Pejtersen, 2000).

More recent studies, however, have found the opposite. For instance, Marton and Choo (2002) did not find a significant relationship between source accessibility and source usage. Woudstra and van den Hoof (2007) found that “source quality is the most dominant factor in the selection of human information sources” (p. 1267). Consistent with the predictions from earlier information processing research (Daft, Lengel, & Trevino, 1987; Daft & Macintosh, 1981; Weick, 1979), it is argued that high-quality information sources should normally be preferred over low-quality information sources because these sources can reduce equivocation and uncertainty more effectively, which is the very purpose of information seeking. How individuals seek a balance between these two characteristics of information sources will be discussed later. For the moment, it is reasonable to hypothesize:

H1: Perceived source accessibility is positively associated with the likelihood of choosing an information source.

H2: Perceived source quality is positively associated with the likelihood of choosing an information source.

The Sufficiency Principle

The conflicting findings on the relative importance of the accessibility versus the quality of information sources in information seeking are summarized in Table 1. These conflicting results indicate that prioritizing either accessibility or quality can be arbitrary. As stated earlier, an alternative strategy therefore is to focus on the interplay between the two because individuals simultaneously may perceive both accessibility and quality as key factors influencing their source choices under any given set of circumstances. To resolve the trade-off in either case, some researchers have proposed that individuals may follow the “law of least effort” (Zipf, 1949); that is, a source is selected based on the least effort required to attain it. In a systematic analysis of factors affecting the information-seeking behavior of engineers, Hertzum (2002) found accessibility to be the single most important determinant, therefore giving clear evidence of the least effort principle. However, although this principle provides a general explanation about why source accessibility was more important than quality, it is not a precise explanation since people will certainly not minimize acquisition effort to the degree that quality is completely sacrificed. In contrast, the present study attempts to achieve the necessary precision by using the
### TABLE 1. Previous research on source selection between accessibility and quality.

<table>
<thead>
<tr>
<th>Study</th>
<th>Respondents</th>
<th>Main finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rosenberg (1967)</td>
<td>Professional personnel in scientific organizations</td>
<td>Source accessibility is significantly correlated with source preference ranking.</td>
</tr>
<tr>
<td>Gerstberger &amp; Allen (1968)</td>
<td>Engineers</td>
<td>Source accessibility is an important determinant of use.</td>
</tr>
<tr>
<td>Orr (1970)</td>
<td>Scientists</td>
<td>Information quality is the most important consideration in selecting the information source.</td>
</tr>
<tr>
<td>Hardy (1982)</td>
<td>Personnel from U.S. Forestry Service</td>
<td>Although source accessibility does not exclusively determine source usage, it weighs most heavily in the decision of information seekers.</td>
</tr>
<tr>
<td>O’Reilly (1982)</td>
<td>Welfare agents</td>
<td>Although source quality matters, reported frequency of use is primarily a function of the rated accessibility of the source.</td>
</tr>
<tr>
<td>Culnan (1983)</td>
<td>Employees from a bank and a manufacturing firm</td>
<td>Perceived source accessibility is an important determinant for information acquisition process.</td>
</tr>
<tr>
<td>Swanson (1987)</td>
<td>Organizational employees</td>
<td>Source quality plays a significant role in source use.</td>
</tr>
<tr>
<td>Zmud, Lind, &amp; Young (1990)</td>
<td>Managers and professional staff</td>
<td>Accessibility is the dominant attribute for lateral communication while quality seems to be more important for downward communication.</td>
</tr>
<tr>
<td>Auster &amp; Choo (1994)</td>
<td>CEOs</td>
<td>Source quality is the most important factor in explaining source use.</td>
</tr>
<tr>
<td>Pinelli et al. (1991)</td>
<td>U.S. aerospace engineers and scientists</td>
<td>While accessibility does exert influence, relevance seems to be the single most important determinant for source usage.</td>
</tr>
<tr>
<td>Choo, Detlor, &amp; Turnbull (2000)</td>
<td>Information technologists and corporate managers</td>
<td>Accessibility is correlated with source use of business associates, mass media, external reports, and internal library, while quality is significantly correlated with source use in the case of customers, competitors, external reports, colleagues in the same department, internal memos, and internal library.</td>
</tr>
<tr>
<td>Cool &amp; Xie (2000)</td>
<td>Engineers</td>
<td>Regardless of accessibility, engineers make different uses of information and communication resources.</td>
</tr>
<tr>
<td>Marton &amp; Choo (2002)</td>
<td>Female personnel from information technology industry</td>
<td>Perceived source quality is a strong predictor for source usage. Source accessibility is not significantly related to source usage.</td>
</tr>
<tr>
<td>Morrison &amp; Vancouver (2000)</td>
<td>Engineers</td>
<td>Expertise is more important than accessibility for source selection.</td>
</tr>
<tr>
<td>Xu, Tan, &amp; Yang (2006)</td>
<td>Nonresearch employees in a university</td>
<td>Quality-driven perspective is more adequate than the principle of least effort, and cost factors are of much less importance.</td>
</tr>
<tr>
<td>Zimmer, Henry, &amp; Butler (2007)</td>
<td>MBA students</td>
<td>Source accessibility and quality both matter, and their relationship is moderated by source type: relational vs. nonrelational.</td>
</tr>
</tbody>
</table>

The **sufficiency principle** (Chaiken et al., 1989) to further explain how and why people often strike a balance between quality and accessibility in information seeking.

When information need is high, we hypothesize that information seekers will tend to favor the quality of a source more than its accessibility because first, high information need implies a high level of task uncertainty and equivocation (Daft et al., 1987; Weick, 1979). Under these circumstances, the most credible and authoritative sources in the workplace are sought to fill the gap because quality sources are much more likely to alleviate uncertainty. Further, the need to consult quality information sources heightens when people with high information need have limited knowledge about the subject at issue and therefore low confidence to judge the quality of information. In such situations, the assurance of sound judgment from quality sources becomes particularly valuable.

In contrast, when the information need is low, people believe they need less information to solve a problem, making it more likely that they will select a more accessible source. Under these circumstances, information seekers are less likely to expend extra effort to locate a credible and
authoritative source, particularly if they are more confident in judging the quality of information in the absence of such credible source. Hence, selecting an information source is more likely to be a function of accessibility than quality. Taken together, we expect that:

**H3:** Information need moderates information seekers’ choice between quality and accessible sources such that (a) as information need increases, people are more likely to choose sources with high-quality information; and (b) as information need decreases, people are more likely to choose sources with high accessibility.

**Choice Between Relational Versus Nonrelational Sources**

A second important consideration for source selection that has been noted in earlier information seeking research is whether an information source is relational or nonrelational (Hertzum & Pejtersen, 2000; Rulke et al., 2000; Zimmer et al., 2007). Past research has shown that most employees in contemporary organizations use both relational and non-relational resources when seeking expert knowledge (Yuan, Fulk, & Monge, 2007). On one hand, relational sources (e.g., colleagues and experts) are valuable for knowledge management (Rulke et al., 2000) because they represent the primary avenue by which tacit knowledge (i.e., that type of knowledge which is difficult to codify or document; Polanyi, 1967) is shared (Hansen, 1999). They can provide immediate and focused responses given specific questions. Yuan, Fulk, Monge, and Contractor (2010) suggested two preconditions for effective information seeking from either peers or supervisors. First, following transactive memory system (TMS) literature (Wegner, 1987), employees need to know “who knows what” to locate information. Second, information seekers need to establish network relationships with information providers to ensure actual access to information because such factors as the investment of time or potential of interpersonal conflict may otherwise make known expertise inaccessible.

Nonrelational sources (e.g., corporate intranet) are also valuable, and their advantages were summarized by Kalman, Monge, Fulk, and Heino (2002). First, electronic information repositories can provide both synchronous (e.g., instant messages) and asynchronous communication (e.g., e-mail). Second, multiple requests can be satisfied through a one-time input to the collective repository. Third, knowledge seekers can go beyond organizational boundaries to seek information. Finally, knowledge seekers can obtain needed information without having a personal tie with an expert.

Although the previous studies have acknowledged the importance of relational and nonrelational resources, respectively, a common limitation of current research is its prioritization of the advantages of relational over nonrelational resources, or vice versa (Borgatti & Cross, 2003; Hansen, 1999), as shown in Table 2. To address this limitation, the present study investigates how information need might explain the selection of relational and nonrelational information sources. Specifically, we predict that when information need is low, people may be more likely to select the more

<table>
<thead>
<tr>
<th>Study</th>
<th>Respondents</th>
<th>Main finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hansen (1999)</td>
<td>Employees in a large electronics company</td>
<td>Weak ties, characterized by infrequent communications, are more efficient for seeking and sharing well-codified knowledge.</td>
</tr>
<tr>
<td>Cool &amp; Xie (2000)</td>
<td>Engineers</td>
<td>Colleagues and work group members are the most important information providers. The World Wide Web is the strongest example of high access, high use, and low satisfaction.</td>
</tr>
<tr>
<td>Hertzum &amp; Pejtersen (2000)</td>
<td>Engineers</td>
<td>Engineers search for documents to find people, search for people to get documents, and interact socially to get both oral and written information without engaging in explicit searches.</td>
</tr>
<tr>
<td>Hirsh (2000)</td>
<td>Researchers in Hewlett-Packard labs</td>
<td>Typically, scientists and engineers approach colleagues within their organization first when they need information.</td>
</tr>
<tr>
<td>Borgatti &amp; Cross (2003)</td>
<td>Information scientists</td>
<td>The probability of seeking information from another person increases if individuals (a) know what that person knows and (2) are able to gain timely access to that person without too much cost.</td>
</tr>
<tr>
<td>Fidel &amp; Green (2004)</td>
<td>Engineers</td>
<td>Engineers tend to select human information resources with whom they are familiar while saving time is the most frequently mentioned reason for selecting documentary sources.</td>
</tr>
<tr>
<td>Hirsh &amp; Dinkelacker (2004)</td>
<td>Researchers in Hewlett-Packard labs</td>
<td>Participants tend to rely heavily on the Internet and other Web-based resources, more so than on their colleagues inside the company.</td>
</tr>
<tr>
<td>Savolainen (2007)</td>
<td>Individuals active in environmental issue</td>
<td>Human and network sources are often favored in the early phases of information seeking, and print media are preferred to complement information received from human sources and the Internet.</td>
</tr>
<tr>
<td>Yuan et al. (2008)</td>
<td>CCE educators</td>
<td>Individuals are very goal-oriented. They often use both interpersonal and electronic means together to complement each other.</td>
</tr>
</tbody>
</table>
readily available nonrelational sources such as the Internet. Two reasons account for this phenomenon. First, having low information need means that individuals already have some internal capability to judge the quality of needed information and know exactly what they are looking for. Second, as shown in previous literature, searching online resources is relatively efficient. For instance, detailed interviews of 32 engineers conducted by Fidel and Green (2004) revealed that saving time is the most frequently mentioned reason for preferring online sources. Similarly, Savolainen (2007) found that the Internet allows individuals to conduct focused searches at their own pace.

By contrast, when information need is high, individuals might prefer to talk to an expert who can provide trustworthy opinions and prompt feedback. Zipperer (1993) identified several reasons supporting engineers’ preference for obtaining information directly from colleagues: (a) Colleagues can provide feedback, either as trusted sources or as impetus for creative solution; (b) a colleague’s memory might be the only access point to field documents, and (c) close relationships with colleagues enable the selection of trustworthy experts within a particular subject domain. Integrating findings from the aforementioned studies, we expect that:

\[ H4: \text{As information need increases, all else being equal, people are more likely to choose relational sources than nonrelational sources.} \]

**Method**

**Design and Procedure**

Empirical data for the study were collected from extension educators working for the extension office of a large university across 58 counties in a Northeastern U.S. state. Extension educators represent a diverse group of professionals from different programs including, for example, youth development, agriculture and food systems, community and economic vitality, environment and natural resources, and nutrition and healthy families. Most educators can be characterized as subject specialists performing rather complex tasks such as conducting research-based educational programs and providing one-on-one consultations in their specialty area in a certain county. Because the mission of educators is to improve people’s lives and their communities through brokering information from the government, research institutes, and so on, such as new agriculture-related policy and effective family communication skills, the extension office provides a great opportunity to study source selection in information seeking.

Data collection contained three steps. In Step 1, 26 extension educators were interviewed to determine the common information sources they would use, the common problems they would normally encounter in their jobs, and some other contextual information about the extension system. Analysis showed that their demographic information was comparable to that of the survey participants. Information gained from the interviews was used to design and revise survey questions. Based on the analysis of the interview data, eight information sources were identified in Step 2 of data collection. Specifically, four sources were identified as nonrelational: academic and government Web sites (e.g., USDA), commercial Web sites (not associated with a university), information databases requiring a paid subscription, and trade magazines available only by personal subscription. Four relational sources also were identified from the interview data: experts in the extension system personally known, experts with a “difficult personality,” coworkers with a “difficult personality,” and local salesmen personally known. These eight sources represented information sources with varying levels of quality and accessibility. For instance, “an expert with difficult personality” represented a relational source with high information quality but low accessibility; “local salesmen personally known” represented a relational source with high accessibility but questionable quality because salesmen’s opinions typically favor their own products, as described by the interviewees.

After the survey was finalized, it was pilot-tested with 12 extension educators from the same population whose demographic information was comparable to that of the survey participants. Their responses confirmed that the information sources were representative of the typical information sources that they usually encounter at work.

In Step 3, surveys were distributed to extension educators via their executive directors in every county. Educators were informed that the goal of the project was to gain a clearer understanding of their information-seeking behaviors and that their participation was voluntary and confidential. One month later, a personalized reminder e-mail was sent to every extension educator. Additionally, researchers also distributed hard-copy surveys through three major events of the extension office with the permission of the organizers. Altogether, 165 of 612 educators completed our survey. The response rate was 25%, which is comparable to many studies using online surveys in organizational research (Sheehan, 2001). Among those who provided valid responses, the median age was 31.7 years, 74% of the respondents were female, 30.8% of the respondents had a bachelor’s degree, and 45.8% of the respondents had a master’s degree in a relevant field. No difference in demographic background was found between people who completed the survey online versus paper-and-pencil respondents. Sixteen cases were excluded from the analysis after data were screened for incomplete responses. The final sample size for the study was 149.

**Measurement**

**Research variables.** Information need was computed by calculating the difference between the two variables current information and sufficiency threshold. Participants were instructed to write down one question involving the search for information related to work they recently encountered. Respondents were then instructed to evaluate, on a scale of 0 (knowing nothing) to 10 (knowing everything), “How much did you already know about the topic?” (current knowledge)
TABLE 3. Descriptive statistics and zero order correlations.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Gender</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>2. Education</td>
<td></td>
<td>–</td>
<td>0.22**</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>3. Likelihood of selection</td>
<td>0.11**</td>
<td>0.04</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>4. Quality</td>
<td>0.16**</td>
<td>0.07</td>
<td>0.30**</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>5. Accessibility</td>
<td>0.09*</td>
<td>0.07</td>
<td>0.42**</td>
<td>0.43**</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>6. Information need</td>
<td>–0.00</td>
<td>–0.03</td>
<td>0.03</td>
<td>0.35**</td>
<td>–0.01</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>7. Relational/Nonrelational</td>
<td>0.00</td>
<td>0.00</td>
<td>0.26**</td>
<td>0.15**</td>
<td>–0.01</td>
<td>0.00</td>
<td>–</td>
</tr>
<tr>
<td>(M)</td>
<td>0.74</td>
<td>2.45</td>
<td>3.14</td>
<td>4.28</td>
<td>3.77</td>
<td>1.97</td>
<td>0.50</td>
</tr>
<tr>
<td>(SD)</td>
<td>0.44</td>
<td>0.88</td>
<td>1.99</td>
<td>1.47</td>
<td>1.36</td>
<td>0.52</td>
<td>0.50</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (two-tailed). **Correlation is significant at the 0.01 level (two-tailed).

and “How much knowledge about this topic would you have needed to adequately answer the question?” (sufficiency threshold). Next, respondents were asked to evaluate how likely they would choose each of the eight sources on a 7-point scale (1 refers to unlikely to choose, and 7 refers to very likely to choose), referred to as likelihood of selection as our dependent variable.

Items for accessibility were adapted from Zimmer et al. (2007), which includes four adjectives on a scale of 1 (not at all) to 7 (to a very large extent) and captures different dimensions of accessibility: (a) easy to access, (b) available when I need it, (c) easy to extract information from, and (d) impersonal (reverse-coded). The coefficient alpha for this scale was 0.60. The correlation table suggested that “impersonal” did not correlate well with other items and was therefore deleted. The final accessibility measurement was the average of these five items, with a reliability coefficient alpha of 0.89.

Similar to accessibility, items for quality were adapted from the work of O’Reilly (1982), McKinney and Yoon (2002), and Zimmer et al. (2007). This scale included five adjectives on a scale of 1 (not at all) to 7 (to a very large extent): (a) accurate, (b) easy to understand, (c) credible, (d) valuable, and (e) informative. This scale had a coefficient alpha of 0.93. The final quality measurement was the average of these five items.

Control variables. Education was measured on a scale of 0 (< a bachelor’s degree) and 3 (have a doctoral degree, or the equivalent). Education was included as a control variable because previous research suggests that education level might affect people’s information seeking behaviors (Newman & Staelin, 1972). Gender also was included as a control variable. Descriptive statistics and zero order correlations of both research and control variables are reported in Table 3.

Analysis

The final dataset used for analysis included 628 source-selection cases nested within 149 individuals. The nested data structure refers to measures of accessibility evaluation, quality evaluation, and the selection likelihood of each of the eight sources nested within each survey respondent. This nested structure of the data violates the assumption of independence of observation in ordinary least squares regression. Therefore, we used hierarchical linear models to analyze the data (Raudenbush & Bryk, 2002), which are justified both on statistical and substantive grounds. First, hierarchical linear modeling (HLM) techniques are needed to provide unbiased estimates of \(SEs\) for hypothesis testing (Raudenbush & Bryk, 2002; Snijders & Bosker, 1999), when the observations are not independent. Second, HLM allows variance to be partitioned into within-subject and between-subject effects. Partitioning between-subject effects can yield cleaner estimates of within-subject effects. In the context of our research, it means that HLM can provide better estimates of not only between-person differences across extension educators in their selections of different information sources but also within-person differences in choosing among the eight options. Additionally, HLM provides the flexibility of specifying cross-level moderation effects, which is needed to test our moderation hypotheses given the nested nature of our data. For example, H3a predicted that source accessibility had a greater impact on source selection with low information need. Using HLM techniques, this moderation hypothesis can be tested by examining whether the regression slope that depicts the relationship between accessibility and likelihood of choosing a particular information source (a relationship between two Level-1 variables) changes with different levels of information need (a Level-2 variable describing an individual person’s overall information need).

Results

Following Raudenbush and Bryk’s (2002) recommendation, a hierarchical null model, equivalent to a random-effect ANOVA test, was conducted to examine the variance in the dependent variable, likelihood of selection. The intraclass correlation, which measures the level of interdependence of the data within a nesting unit, was 0.12, which indicates that 12% of the total variance in the likelihood of selection can be explained by within-subject differences. This result demonstrated a strong need for using a multilevel modeling approach.
TABLE 4. Summary of hierarchical linear modeling analysis results.

<table>
<thead>
<tr>
<th>Fixed Effect: Predictors</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>-0.08</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.01</td>
</tr>
<tr>
<td>Education</td>
<td>0.08</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Accessibility</td>
<td>0.51**</td>
<td>0.13</td>
<td>0.18</td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>0.34**</td>
<td>0.63**</td>
<td>0.44**</td>
<td></td>
</tr>
<tr>
<td>Information need moderating medium accessibility*</td>
<td>0.48**</td>
<td>0.46**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information need moderating medium quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information need moderating low accessibility</td>
<td>-0.48**</td>
<td>-0.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information need moderating low quality</td>
<td>0.15</td>
<td>0.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relational/nonrelational sources</td>
<td>0.55*</td>
<td>0.55*</td>
<td></td>
<td>0.10*</td>
</tr>
<tr>
<td>Information need moderating relational/nonrelational sources</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of Level-1 variance explained in addition to Model 1</td>
<td>7%</td>
<td>7%</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>

*Information need is dummy-coded as a three-level categorical variable, and the reference group is the high-information-need group.

*Correlation is significant at the 0.05 level (two-tailed).

**Correlation is significant at the 0.01 level (two-tailed).

Next, two control variables (education and gender) were included into the model. The relationships between both education/gender and the likelihood of selection were not significant. The deviance score (−2 log likelihood) of Model 1 was 2472.7, which was used as a baseline to evaluate significance in model improvement. The results are reported under Model 1 in Table 4.

H1 and H2 predicted that perceived accessibility and quality of information source were positively associated with likelihood of selection. Both hypotheses were tested simultaneously. The results showed that both of the proposed positive relationships between perceived accessibility and the likelihood of selection and between quality and likelihood of selection, \( \beta_{\text{accessibility}} = 0.51, t(147) = 8.11, p = 0.001; \beta_{\text{quality}} = 0.34, t(147) = 5.47, p = 0.001, \) were significant. Therefore, both H1 and H2 were supported. Further, by comparing the deviance scores of Models 1 and 2, the improvement in model fit was shown to be significant, \( \theta^2(df = 2) = 2472.7 - 2300.1 = 172.6. \) The results were reported under Model 2 in Table 4.

H3a and H3b proposed that information need negatively moderated the relationship between accessibility and likelihood of selection, and positively moderated the relationship between quality and likelihood of selection. These two moderation effects were tested simultaneously by investigating the impact of information need (a person-level/Level-2 variable) on the Level-1 regression slopes of the likelihood of selection on accessibility and quality, respectively. Since a preliminary graphic demonstration showed that the effect of information need was curvilinear, information need was coded into three levels (high, medium, low). The medium group contained those within 1 SD of the mean. Interestingly, findings from hypothesis testing indicated that the slope measuring the impact of accessibility on source selection became significantly larger for the medium-information-need condition, \( \beta_{\text{medium information need with accessibility}} = 0.48, t(147) = 2.61, p = 0.001, \) than it did for the high-information-need group. However, the strength of relationship between accessibility and source selection was not significantly different between low- and high-information-need conditions, \( \beta_{\text{low information need with accessibility}} = 0.15, t(147) = 0.73, p = 0.47. \) Such differences in the strength of relationship are depicted in Figure 1, in which the solid line depicting the slope of accessibility for source selection for medium information need was observed to be steeper than the dashed line, which represented the slope of low- and high-information-need groups combined since, as shown earlier, the differences in the regression slopes for these two groups were not significant.

In contrast, the slope measuring the impact of source quality on source selection was significantly smaller for the medium-information-need condition, \( \beta_{\text{medium information need with quality}} = -0.36, t(147) = -2, p = 0.001, \) than for the high-information-need group. Similar to accessibility, the relationship between quality and source selection was not significantly different between low- and high-information-need conditions, \( \beta_{\text{low information need with quality}} = -0.16, t(147) = -0.82, p = 0.40. \) Such differences in the strength of relationships are depicted in Figure 2, in which the solid line depicting the slope of source selection on quality was observed to be less steep for the medium-information-need groups than for the non-medium-information-need groups as indicated by the dashed line. When compared, the deviance scores of Models 1 and 3 showed that the improvement in model fit was significant, \( \theta^2(3) = 2472.7 - 2299.3 = 173.4. \) The results are reported under Model 3 in Table 4.

In summary, the moderation effect of information need on the relationship between accessibility/quality and source selection was curvilinear. Specifically, as information need increased from low to medium and then to high, the effect of accessibility became stronger for a medium level of information need and then weaker for a high level of information need. In contrast, the impact of quality became weaker for a medium level of information need, but stronger for a high level of information need. The conceptual implications of the finding will be elaborated on later.

H4 predicted that individuals tend to choose relational sources more than nonrelational sources when information...
FIG. 1. Relationship between accessibility and likelihood of selection when information need is medium versus high/low.

FIG. 2. Relationship between quality and likelihood of selection when information need is medium versus high/low.

need increases. When the information source types (relational vs. nonrelational) were included in the model, the result, $\beta_{\text{information need with relational/nonrelational}} = 0.11$, $t(148) = 1.97$, $p = 0.001$, showed support for H5. Information need was introduced into the model as a continuous variable since a preliminary graphic demonstration showed that the effect of information need was linear. By comparing the deviance scores of Models 1 and 4, we find that the improvement in model fit was significant, $\theta^2(4) = 2472.7 - 2235.1 = 237.6$. The results are reported under Model 4 in Table 4.

Discussion

Going beyond prior studies prioritizing either quality or accessibility as a key determinant of information source selection, we examined how information moderated individuals’ choices between the characteristics of information sources (i.e., quality and accessibility) and between the type of information source (i.e., relational and nonrelational). Following the sufficiency principle, we argue that both quality and accessibility matter for source selection, and which one matters most further depends on the degree of information need. In addition, we also propose that employees rely on both relational and nonrelational information sources, and that these information needs also moderates the choice individuals make between them. In particular, we focused on subjective source evaluation to supplement previous research that has investigated objective information source characteristics. For instance, younger generations are comfortable with Google search because the Internet always has been available,
but the same information source can be considered intimidating for those who have never used a computer. Hence, we believe that focusing on individual information seekers’ subjective perceptions can more accurately capture differences in choices that individual seekers make in their own search.

A Trade-off Between Quality and Accessibility

Consistent with previous research, both quality and accessibility were positively related to the likelihood of selection of an information source. Yet, the moderating effects of information need on the impact of quality and accessibility on source selection were much more complicated and intriguing than was the linear relationship, as had been hypothesized. In particular, as information need rose, the influence of accessibility on source selection increased and then decreased while the effect of quality was the reverse. To further examine the impact of accessibility and quality on source selection, we plotted an overlay chart within each information need category, as Figures 3, 4, and 5 demonstrate.

Figure 3 shows that when information need is low, both accessibility and quality matter. Accessibility is important at this point because as stated earlier, people with low information need are less likely to put forth extra effort in seeking information given the relatively high self-confidence they have as judges of incoming information. Somewhat different
from our original linear hypothesis, quality is also valuable for those with low information need. Still, this result makes sense if one considers that low information need signals that information seekers are very focused on the information-seeking process, meaning that they know exactly what they are looking for. In addition, they may already have considerable knowledge on a topic. In these situations, only high-quality sources (e.g., an expert on this topic) can serve their need. Taken together, both quality and accessibility are critical for those with low information need. In the medium-information-need condition, as Figure 4 suggests, the impact of accessibility on source selection becomes significantly stronger in comparison to the weakening influence of source quality. This finding is consistent with the sufficiency principle, which assumes that individuals are cognitive misers (Taylor & Fiske, 1978) and that they just need a “good-enough” answer instead of the “best” one. Further, consistent with our hypothesis, Figure 5 reveals that quality is a stronger predictor than accessibility in source selection for people with high information need; that is, when individuals experience a high level of uncertainty and equivocation (Daft & Macintosh, 1981) caused by their limited knowledge about a particular topic, they have a stronger need to find high-quality information sources to establish a sound basis for knowledge acquisition and to reduce anxiety.

Worthy of special attention is the finding that quality was a stable predictor across all information need conditions. Taking a historical perspective, we realized that while early studies have found that accessibility was more influential than was quality in information source selection (Allen, 1977; Rosenberg, 1967), this trend seemed to have reversed in more recent ones (e.g., Marton & Choo, 2002; Woudstra & van den Hooff, 2008). It is possible that the rapid growth of the Internet and of the digitalization of information have made information accessibility a lesser challenge for information seekers. Further, this finding also confirms the importance of regularly reevaluating the impact of different information source characteristics in information-seeking research because developments in technology can change the landscape of information seeking in significant ways.

In summary, the current study clearly demonstrates a trade-off, or a finely tuned balance, between quality and accessibility in information source selection. The moderation effect of information need on the relationship between accessibility and quality, and likelihood of selection, is not linear but curvilinear. Instead of tending toward one source or the other, individuals skillfully adjust their information-seeking strategies according to their information needs. In addition, the results also revealed a boundary condition for the sufficiency principle, as shown in Figure 5, where information seekers with high information need showed a stronger inclination to seek information from quality sources despite source accessibility. Moreover, the finding of such a curvilinear moderation effect of information need on the relationship between quality/accessibility and source selection helps resolve some of the controversies in earlier information-seeking research. Again, some earlier studies have emphasized the importance of source accessibility while others have prioritized source quality, without any consideration of information seekers’ actual information-seeking need. Our results showed that both source characteristics are important, and that information need can function as a contingency factor such that the relative importance of one characteristic over the other shifts with information need.

Choice Between Relational Sources or Nonrelational Sources

Previous theories on communication technology and information usage have provided some guidelines on how individuals choose between relational and nonrelational information sources. For instance, the media richness theory (Daft &
Lengel, 1986) proposes that face-to-face information sources are most desirable when handling complicated and ambiguous tasks. The current study, however, addressed this question from a different perspective: how information need influences whether individuals will select relational or nonrelational information sources. When information need increases, our results show that people are more likely to consult relational sources, which is consistent with the findings of O’Reilly (1983)—that people favor oral over written information under the circumstances of high uncertainty. All these results support earlier findings about the importance of interpersonal communication in information seeking (Hiltz, Johnson, & Turoff, 1986). In a sense, our results echo earlier findings about the importance of developing strong interpersonal ties/relational sources in sharing tacit knowledge because rich communication cues and timely feedback can more effectively reduce ambiguity and uncertainty in the learning process (Hansen, 1999).

**Limitations and Directions for Future Research**

In the current study, we tested our hypotheses using data collected from an extension education office. While our study population provides an ideal sample to study information seeking, the uniqueness of an extension educator’s job may influence the generalizability of the results from this organization to other organizations. The role of extension educators is to act as an information broker between producers, academic researchers, and government agencies. On one hand, these professionals highly respect the quality of information sources because any mistake they make might result in considerable losses to producers. On the other hand, they also value source accessibility because many of their job responsibilities (e.g., providing consulting services on pest control in the fields) are time-sensitive. While the need to constantly balance between quality and accessibility in information source selection may not be totally unique to extension educators, it is nevertheless interesting to explore in future research whether other such situational factors present in other types of organizations will, in addition to information need, play a role in information source choices.

In addition, future research also should explore complementary use of multiple information sources over time so that people could combine information from multiple sources to make more informed decisions easier and faster. Recent work has shown that individuals use information sources in both a monophasic and a polyphasic fashion (Massey & Montoya-Weiss, 2006). Specifically, Stephens (2007) proposed that multiple information and communication technologies can be used successively, and Yuan et al. (2007) showed that employees use both electronic and interpersonal sources to solve problems in a complementary way instead of replacing one source with another. During our interviews, we also observed complementary usage of relational and nonrelational sources in different phases of information seeking. For instance, some educators commented that they use Google as the starting place and then call their colleagues for further consultation. While our study has begun to explore the interplay of multiple factors in source selection, future theoretical development about complementary usage multiple information sources would provide a valuable direction for future research.

Moreover, since the current study taps into the influence of people’s subjective experience on information seeking, potential new methodologies can be used to further test the results. For instance, an information-seeking diary or ethnography of an extension educator could give us more in-depth insights about how information seekers make decisions concerning what information sources they consider and why they ultimately choose them.

**Implications for Practice**

The significance of understanding information-seeking behavior increases as information becomes the primary mode of production in the knowledge economy (Morrison & Vancouver, 2000; Vancouver & Morrison, 1995). The current study implies that organizations should anticipate that employees will seek information which they regard as both credible and easily accessible. This can be accomplished by finding a workable correspondence between what management views as significant and accessible and what employees view as important and easy to locate.

One important practical implication from the current study is that an individual’s subjective evaluation of information needs influences information-seeking behavior. While information need as a self-evaluation can be very subjective, it is this very judgment that influences the amount of effort that seekers are willing to put into seeking information. While both high- and low-information-need seekers prefer high-quality sources, the potential danger of insufficient information seeking exists when the seekers have a medium level of information need. The study showed that these people are more likely to go for accessible rather than quality sources. As a result, people’s job performance may be compromised when accessible information is biased or of questionable quality. Given the medium-information-need seekers’ tendency to settle for accessible information, it is important that seekers constantly question their own expertise level.

Another practical implication of our results regards the choice between relational and nonrelational sources. Employees need both sources to accomplish their jobs (Yuan et al., 2007); therefore, managers of organizational knowledge should take into consideration the trade-off people often employ in selecting information sources, as discussed in this study, to avoid misuse of electronic systems. On the other hand, given the importance of seeking information from relational sources, organizations should foster the development of communities of practices (Lave & Wenger, 1991) and wide social networks to support information seeking through interpersonal ties instead of focusing on finding a technological solution alone.
Conclusions

Information seeking is a fundamental process in all organizations. Our results validate the significance of information source attributes (i.e., quality and accessibility) as well as the influence of relational and nonrelational sources. In contrast to arbitrarily prioritizing one or the other, we have taken the viewpoint that information need operates as a moderating factor such that individuals strike a balance in choosing one attribute over another. In brief, our results showed that people skillfully adjust their information-seeking strategies according to their need such that quality matters more when information need is high or low while accessibility is more crucial when information need is at a medium level. Our research has also provided one possible way of resolving the conflicting findings from earlier studies, especially those that have focused on prioritization as a means of media choice.

Acknowledgment

This project was funded partially by USDA/CSREES-CUAES Grant NYC-131405 and NSF Grant 0822784 awarded to the second author.

References


