

AI: Archival Intelligence and User Expertise

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Abstract

User studies in archives have long focused on researchers' satisfaction, behaviors, and use of primary sources. Yet, archivists have never defined what characteristics denote an expert user of archives. This article reports on a research study involving in-depth interviews with twenty-eight individuals. The analysis of these interviews led to the development of a model of researcher expertise that might be incorporated into archival user education to create information literacy for primary sources. The authors assert that there are three distinct forms of knowledge required to work effectively with primary sources: domain (subject) knowledge, artifactual literacy, and the authors' own concept of archival intelligence. Archival intelligence is a researcher's knowledge of archival principles, practices, and institutions, such as the reason underlying archival rules and procedures, the means for developing search strategies to explore research questions, and an understanding of the relationship between primary sources and their surrogates. This is separate from domain or subject knowledge and artifactual literacy, or the ability to interpret and analyze primary sources. Archival intelligence encompasses three dimensions: 1) knowledge of archival theory, practices, and procedures; 2) strategies for reducing uncertainty and ambiguity when unstructured problems and ill-defined solutions are the norm; 3) and intellectual skills.

*Archival research is a special case of the general messiness of life.*¹

Introduction: What Is User Expertise in Archival Research?

User studies in archives have long focused on researchers' satisfaction, behaviors, and use of primary sources. Yet, archivists have never defined what characteristics denote an expert user of archives. This

¹ Peter Novick, *That Noble Dream: The "Objectivity Question" and the American Historical Profession* (Cambridge and New York: Cambridge University Press, 1988), 619. Novick is quoting Lawrence Stone in the David Abraham case. The entire quotation reads, "When you work in the archives you're far from home, you're bored, you're in a hurry, you're scribbling like crazy. You're bound to make mistakes. I don't believe any scholar in the Western World has impeccable footnotes. Archival research is a special case of the general messiness of life."

article proposes a model of researcher expertise and discusses how this model might be incorporated into archival user education to create information literacy for primary sources. We assert that there are three distinct forms of knowledge required to work effectively with primary sources. Two of these areas, domain (subject) knowledge and artifactual literacy, have been discussed elsewhere in the literature. To these we add a third: the concept of archival intelligence.

Domain or subject knowledge is an understanding of the topic being researched, for example historic preservation, Jacksonian politics, or the law. This has been shown to be a significant factor in information retrieval in the library and information science literature.² Artifactual literacy is the "practice of criticism, analysis, and pedagogy that reads texts as if they were objects and objects as if they were texts."³ This is the ability to interpret records and assess their value as evidence. Archival intelligence is a researcher's knowledge of archival principles, practices, and institutions, such as the reasons underlying archival rules and procedures, how to develop search strategies to explore research questions, and an understanding of the relationship between primary sources and their surrogates. Our contention is that a researcher's archival intelligence is separate from his or her domain or subject knowledge. Furthermore, we assert that archival intelligence is different from artifactual literacy, or the ability to interpret and analyze primary sources. While related to domain knowledge and artifactual literacy, archival intelligence refers to knowledge about the environment in which the search for primary sources is being conducted, in this case, the archives.

While researchers can potentially obtain subject knowledge and training in the interpretation of primary sources within the confines of their own disciplines or through special interest organizations, such as genealogical groups, the acquisition of archival intelligence is something that should be embraced by archivists as a role unique to them in this educational puzzle. The archival literature has long been silent on the components of and best practices for user education to support archival intelligence or, even more broadly, information literacy for primary sources. The rise of on-line tutorials, perhaps as a result of the availability of other networked information, has been the first opportunity

² For example, see: Gary Marchionini, Sandra Dwiggin, Andrew Katz, and Xia Lin, "Information Seeking in Full-Text End-User-oriented Search Systems: The Roles of Domain and Search Expertise," *Library and Information Science Research* 15 (Winter 1993): 35–69; and Maaïke D. Kiestra, Mia J. W. Stokmans, and Jan Kamphuis, "End-users searching the online catalogue: the influence of domain and system knowledge on search patterns," *The Electronic Library* 12 (December 1994): 335–43.

³ Randy Bass, "The Garden in the Machine: The Impact of American Studies on New Technologies," available at <<http://www.georgetown.edu/bassr/garden.html#rationale>> (4 December 2002).

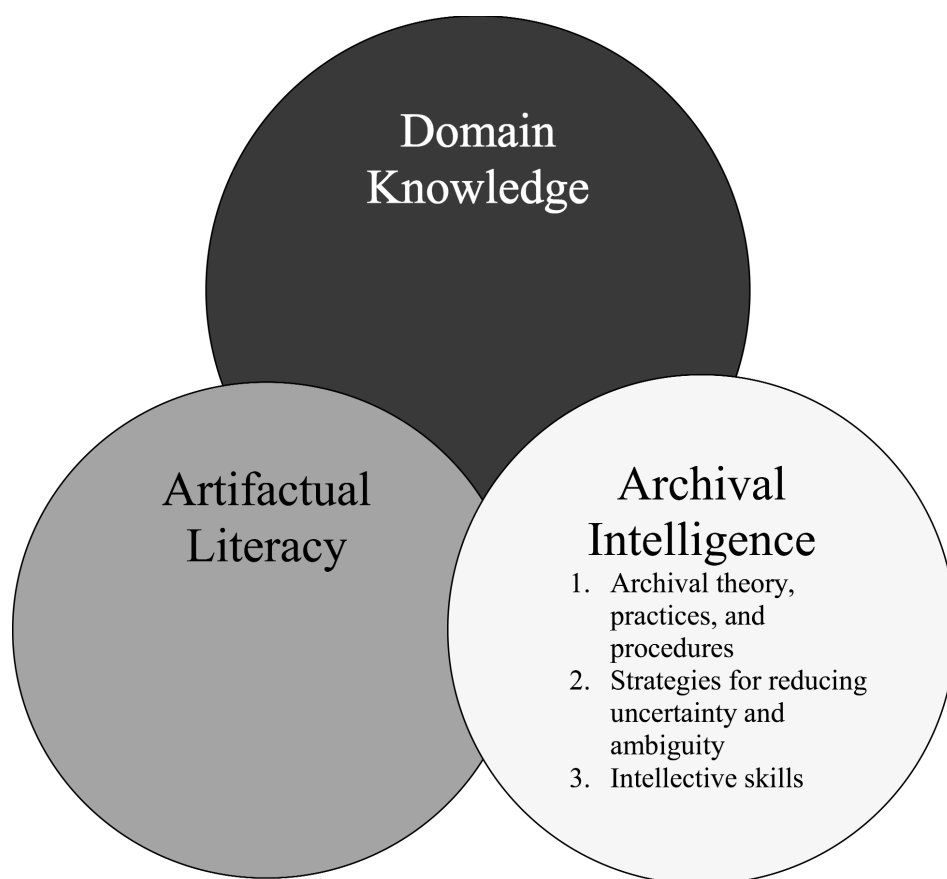


FIGURE 1. User Expertise in Archives

archivists have had to view the content of archival user education in detail.⁴ The present article begins to address this gap. It initiates a discussion on the issue of what constitutes researcher expertise in the area of archives and primary sources.

The research question underlying this study was: Are there certain characteristics that can be identified to distinguish novice and expert users of archives and primary sources? Through interviews with twenty-eight individuals, specific markers (e.g., knowledge and skills) were identified as having an

⁴ On-line tutorials can be found at such universities as Yale University, *Using Manuscripts and Archives: A Tutorial*, <<http://www.library.yale.edu/mssa/tutorial/>> (4 December 2003); Berkeley, Auburn University: *Special Collections & Archives – Archival Tutorial*, <<http://www.lib.auburn.edu/archive/user/>> (4 December 2003); Rice University, *Using Archives: A Guide for Researchers*, <<http://www.rice.edu/Fondren/Woodson/usingarchives.html>> (4 December 2003).

impact on a researcher's ability to search for records and papers, identify useful collections, navigate between representations of primary sources and the records and papers themselves, and develop and pursue a systematic research strategy employing primary sources. Three of the most salient dimensions of archival intelligence are discussed in this article: 1) knowledge of archival theory, practices, and procedures; 2) strategies for reducing uncertainty and ambiguity when unstructured problems and ill-defined solutions are the norm; and 3) intellectual skills, or the ability to understand the connection between representations of documents, activities, and processes and the actual object or process being represented. Within these three dimensions, very specific knowledge and skills can be isolated that will hopefully lead to a rethinking of archival researcher education.

Our findings indicate that for researchers to become expert users of archives and manuscript collections, basic conceptual knowledge and the development of a general framework of archival management, representation and descriptive practices, and search query formulation are necessary. This contrasts with a model of archival user education that focuses on assisting researchers to use a specific repository for a particular project. This is important to reconsider in light of the Internet and the increased amount of archival data (general information, representations, digitized collections) now available on-line with little or no human mediation. One goal of this article is to initiate a discussion in the archival community concerning the purpose and appropriate content for the archival education of researchers, the characteristics that archivists deem important for an expert user of primary sources. Therefore it ends with some comments concerning archival user education.

Literature Review

Three fields of knowledge have had an impact on this study. First, the literature on expertise was instrumental in assisting the authors in identifying key characteristics of expertise and in operationalizing these concepts. Second, the library and information science literature provided a vast array of theory, case studies, and emerging evaluative articles on information literacy, which has subsumed what used to be designated bibliographic instruction. Third, the archival literature has touched on many of the characteristics we contend make up archival intelligence. Therefore, this presentation of the literature on archival user, users, user studies, and user education is organized around the three key concepts of archival intelligence we have identified: knowledge of archival theory, practices, and procedures; strategies for reducing uncertainty and ambiguity when unstructured problems and ill-defined solutions are the norm; and intellectual skills. No discussion of researcher expertise would be complete without mentioning the literature on archival user education. Although the

quantity of literature on user education is small, it offers some clues into the problems of developing archival intelligence.

Research on Expertise

The research on expertise is vast, dealing with its theoretical, cognitive, and physiological aspects, as well as how expertise is realized in different professions and activities. Robert Glaser and Michelene Chi identify several characteristics of expertise. Among these are 1) experts excel mainly in their own domains; 2) experts see and represent a problem in their domain at a deeper level; and 3) experts have strong self-monitoring skills.⁵ Each of these concepts is important, and in this study we have tried to apply them to the archival research process.

As noted in the introduction, we assert that expert users of primary sources need domain knowledge in two areas: 1) their own field of inquiry and 2) the archival domain, theory, practices, and procedures. The need to reach into theories and skills from separate fields of study to accomplish a task has not been dealt with in the literature on expertise. Charles Cole is the only researcher who has discussed subject expertise and primary sources.⁶ His study of historians found that the research strategy of "name collection," the identification and tracing of personal and organizational names pertinent to a particular research project, was an essential part in moving Ph.D. students from novices to experts in their field because it enabled more effective information retrieval as well as helped novices hone their ability to scan large amounts of information quickly. Furthermore, Cole asserts that name collection mimics or perhaps simulates an expert's ability to recognize patterns.

An expert's ability to see and represent a problem can be operationalized in many ways, depending on the field of inquiry. In terms of archival intelligence, seeing and representing a problem can be studied through search strategies, the articulation of research questions, and the ability to associate archival representations or surrogates with actual collections. James F. Voss and Timothy A. Post analyzed the levels of expertise of physicians, magistrates, and political scientists and identified preexisting frameworks that guided the search process.⁷ This implies that the identification of a starting place for the search

⁵ Robert Glaser and Michelene T. H. Chi, "Overview," in *The Nature of Expertise*, ed. Michelene T. H. Chi, Robert Glaser, and Marshall J. Farr (Hillsdale, N.J.: Lawrence Erlbaum Associates, 1988), xvii–xx.

⁶ Charles Cole, "Name Collection by Ph.D. History Students: Inducing Expertise," *Journal of the American Society for Information Science* 51 (2000): 444–55.

⁷ James F. Voss and Timothy A. Post, "On the Solving of Ill-Structured Problems," in *The Nature of Expertise*, ed. Michelene T. H. Chi, Robert Glaser, and Marshall J. Farr (Hillsdale, N.J.: Lawrence Erlbaum Associates, 1988), 274.

and prior knowledge concerning how to search can facilitate problem solving. Building on Cole's findings, we would also assert that his research demonstrated that experts developed a research strategy to reduce uncertainty in unknown environments (e.g., first-time visits to archives).

The ability to associate between representations and the real thing is discussed in the literature on expertise. One of the areas in which this is a key component is the literature on radiological expertise. In one study, expert radiologists were found to have both a more abstract conceptualization of anatomy and the ability to pinpoint pathology more accurately than medical residents.⁸ What we would expect to find, then, in terms of archival expertise is a greater ability on the part of experts to select and visualize primary sources through representations and surrogates. Shoshana Zuboff refers to this ability as intellectual skills, those skills that "combine abstraction, explicit inference, and procedural reasoning" to understand the meaning of a representation.⁹

Finally, the literature on expertise cites self-monitoring and knowledge of one's own limitations as a key factor of expertise because attention can be concentrated on higher-level problems and abstractions. Novices have many gaps in their knowledge and additionally are in the process of learning the rules of an activity or organization. "As long as the beginner pilot, language learner, chess player, or driver is following rules, his performance is halting, rigid, and mediocre. . . . The [expert] performer is no longer aware of the features and rules and his/her performance becomes fluid and flexible and highly proficient."¹⁰ In terms of archives, this led us to examine user's reactions to rules and regulations and their ability to integrate different forms of archival rules and variations in access systems into their research strategies and activities.

Information Literacy: The Library and Information Science Literature Perspective

In the library world, the intellectual nature and paradigm supporting patron education has shifted with the terminology used to describe this activity. In the early twentieth century the term "library orientation" was used. This reflected the view that a physical tour of the facilities was the preparation

⁸ Alan Lesgold, Robert Glaser, Harriet Robinson, Dale Klopfer, Paul Feltovich, and Yen Wang, "Expertise in a complex skill: Diagnosing x-ray pictures," in *The Nature of Expertise*, ed. Micheline T. H. Chi, Robert Glaser, and Marshall J. Farr (Hillsdale, N.J.: Lawrence Erlbaum, 1988), 311–42.

⁹ Shoshana Zuboff, *In the Age of the Smart Machine: The Future of Work and Power* (New York: Basic Books, 1988), 75.

¹⁰ Patricia Benner, *From Novice to Expert: Excellence and Power in Clinical Nursing Practice* (Upper Saddle River, N.J.: Prentice Hall Health, 2001), 33. Benner is quoting Hubert L. Dreyfus and Stuart E. Dreyfus. For a fuller explication of their model of expertise, see Hubert L. Dreyfus and Stuart E. Dreyfus with Tom Athanasiou, *Mind over Machine: The Power of Human Intuition and Expertise in the Era of the Computer* (New York: Free Press, 2000).

necessary to facilitate use of the library. Later, “library instruction” was used, and courses were developed to assist library patrons in searching card catalogs and in understanding such tools as the Dewey decimal system or subject headings at a specific institution. In the 1970s, the term “bibliographic instruction” emerged. This signaled a paradigm shift from assisting a patron in using a library to a broader focus on applying search skills and tactics in any library and a more generalized introduction to the tools of library access. In the 1990s the focus again changed, and “information literacy” became the new terminology. This signified the role of library user education to assist patrons in finding information anywhere in any format and in developing their own searching techniques and enhancing their ability to assess information both inside and outside the physical confines of library buildings.

The library and information science literature on information literacy and bibliographic instruction is vast. In fact, *Reference Services Review* publishes a yearly overview of this literature.¹¹ The bibliographic instruction portion of this literature is characterized by case studies of courses and Web-based tools and instruction aimed at a variety of audiences (K–12, undergraduates, teachers, public library patrons, users of special libraries). Recently, more information concerning evaluation of these initiatives has become evident. This differs from the archival literature in this area in three key aspects. First, a considerable amount of information is published on the mission, content, and design of bibliographic instruction efforts. In colleges and universities, this includes a reconceptualization of the role of bibliographic instruction vis-à-vis general undergraduate education and how such instruction fits into broader efforts to teach critical thinking skills.¹² Second, evaluation is a key component that is helping to guide the development of new instructional efforts.¹³ Third, there is also a minor, but visible literature examining the theoretical basis of the instruction and the underlying assumptions concerning learning and teaching.¹⁴

Research on Archival Researchers

The archival literature provides insight into the importance of the three dimensions of archival intelligence in which we are most interested: knowledge of archival theory, practices, and procedures; strategies for reducing uncer-

¹¹ The most recent review is Anna Marie Johnson, “Library instruction and information literacy — 2000,” *Reference Services Review* 29, no. 4 (2001): 338–61.

¹² See Steven J. Herro, “Bibliographic Instruction and Critical Thinking,” *Journal of Adolescent and Adult Literacy* 43, no. 6 (2000): 554–8.

¹³ For example, see Sue Samson, “What and When Do They Know? Web-based Assessment,” *Reference Services Review* 28, no. 4 (2000): 335–42; and Lucy Holman, “A Comparison of Computer-assisted Instruction and Classroom Bibliographic Instruction,” *Reference and User Services Quarterly* 40, no. 1 (2000): 53–60.

¹⁴ See James M. Marcum, “Rethinking Information Literacy,” *Library Quarterly* 72 (January 2002): 1–26.

tainty and ambiguity when unstructured problems and ill-defined solutions are the norm; and intellectual skills. While often not phrased in exactly these terms, the current body of knowledge on archival users does speak to these dimensions, both directly and indirectly. Knowledge of archival theory, practices, and procedures has many components. Among these are language abilities or the facility to understand archival jargon, an internalization of rules so that they do not get in the way of higher-level thinking, interpretation of primary sources and their surrogates, and an awareness of one's own and others' level of domain knowledge.

The issue of researchers' understanding of the language surrounding primary sources, such as "archives" and "finding aid," has not been widely discussed. In another paper based on this data, one of the authors found that researchers had trouble articulating what an archives was and defining primary sources.¹⁵ This indicates that language facility is a component of successful archival research. Similarly, archival rules surrounding requests for and the use of primary sources are unique and can be overwhelming to novice users. David Bearman's study of user presentation language found that 36 percent of the questions concerned procedures and services. This provides some evidence to support the contention that rules are significant and that researchers may spend considerable time getting past the rules to focus on higher level analysis of primary sources and their surrogates.¹⁶ Awareness of the limits of one's own knowledge and the knowledge of others is an important step in building archival intelligence because it reflects judgment and analysis. Wendy Duff and Catherine A. Johnson's studies of historians and genealogists reveal some of this type of self-scrutiny.¹⁷ On the other hand, expert researchers do not operate under any illusion of the "immortal, omniscient, indispensable reference archivist."¹⁸

The uncertainty and ambiguity of both the questions and the answers in primary source research make searching a difficult process, even though searching is the logical step in reducing both of these problems. Often a search is conducted for items that the researcher is not sure exist. A search is also used as a process of elimination, as a means of ruling out which records exist. We actually know very little about the judgments underlying the behaviors of either

¹⁵ Elizabeth Yakel, "Listening to Users," *Archival Issues* 26, no. 2 (2002): 111–27.

¹⁶ David Bearman, "User Presentation Language in Archives," *Archives and Museum Informatics* 3 (Winter 1989/90): 6.

¹⁷ Wendy M. Duff and Catherine A. Johnson, "Accidentally Found on Purpose: Information Seeking Behavior of Historians in Archives," *Library Quarterly* 72 (October 2002): 472–96; and "Archival Research: Process and Perceptions" (paper presented at the annual meeting of the Society of American Archivists, Birmingham, Ala., August 2002).

¹⁸ Mary Jo Pugh, "The Illusion of Omniscience: Subject Access and the Reference Archivist," *American Archivist* 45 (Winter 1982): 38.

archivists or researchers during the search processes for primary sources, even though Ann Gordon views knowledge of the search process as a core component in archival user education.¹⁹ Archival search processes are also interesting because of the absence of these activities. For example, Paul Conway found that many people just turned up at the National Archives because they “assumed” that certain records would be there.²⁰ Furthermore, multiple information retrieval system research studies have focused on the factors that make searching for primary sources such a difficult process.²¹

Reducing uncertainty and ambiguity is also done through mediation or question asking. From the archivist’s point of view, eliciting the right information from the researcher is essential to fulfilling the researcher’s information need. From the researcher’s perspective, asking the right question is the key to both effective and efficient use of the archives. Question negotiation as a component of the reference interview has long been a part of the archival and library literature, but this presents the reference interaction from the reference archivist’s point of view.²² Recently, Helen R. Tibbo has discussed the application and evolution of these concepts to the electronic era.²³ As will be discussed below, the user’s view of these interactions and their role in eliciting information from the reference archivist is quite different.

Mary Jo Pugh and Richard Lytle cite intellectual skills as an essential characteristic of a good reference archivist, although they do not use this specific terminology. In particular, Lytle highlights intellectual skills in his discussion of archivists’ search strategies using the provenance method and their ability to translate between subjects and provenance.²⁴ Intellectual skills on the part of the researcher are also essential. The major association a researcher has to make is between representations of primary sources and the actual materials.²⁵

¹⁹ Ann D. Gordon, *Using the Nation’s Documentary Heritage* (Washington, D.C.: National Historical Publications and Records Commission and the American Council of Learned Societies, 1992), 55–61.

²⁰ Paul Conway, *Partners in Research: Improving Access to the Nation’s Archive* (Pittsburgh: Archives & Museum Informatics, 1994), 95.

²¹ Avra Michelson, “Description and Reference in the Age of Automation,” *American Archivist* 50 (Spring 1987): 192–208; Kathleen Feeney, “Retrieval of Archival Finding Aids Using World Wide Web Search Engines,” *American Archivist* 62 (Fall 1999): 206–28; and Helen R. Tibbo and Lokman I. Meho, “Finding Aids on the World Wide Web,” *American Archivist* 64 (Spring/Summer 2001): 61–77.

²² Linda J. Long, “Question Negotiation in the Archival Setting: The Use of Interpersonal Communication Techniques in the Reference Interview,” *American Archivist* 52 (Winter 1989).

²³ Helen R. Tibbo, “Interviewing Techniques for Remote Reference: Electronic Versus Traditional Environments,” *American Archivist* 58 (Summer 1995): 294–310.

²⁴ Richard C. Lytle, “Intellectual Access to Archives: I. Provenance and Content Indexing Methods of Subject Retrieval,” *American Archivist* 43 (Winter 1980): 63–75 and “Intellectual Access to Archives: II. Report of an Experiment Comparing Provenance and Content Indexing Methods of Subject Retrieval,” *American Archivist* 43 (Spring 1980): 191–207.

²⁵ For a discussion of archival representation and why the association between surrogate and primary source is difficult, see Elizabeth Yakel, “Archival Representation,” *Archival Science* 3, no. 1 (2003): 1–25.

Numerous research studies have documented how researchers fail to make this critical association (e.g., do not understand) when confronted with a variety of representations such as finding aids,²⁶ MARC records,²⁷ and on-line finding aids.²⁸ One means of stimulating associations and reducing uncertainty is through researcher preparation. While archivists lament unprepared researchers, Conway found a correlation between less preparation and a lack of prior experience in using the National Archives.²⁹ This has wider implications for educating the user and the range of behaviors that are associated with expertise.

The literature on archival user education pales in comparison to that in the library and information science literature. Archivists know surprisingly little about the content of each other's archival education classes.³⁰ The time for sharing information about these different approaches to archival user education has arrived. Gordon quotes one of her respondents as saying, "I received in my graduate training invaluable guidance towards the formation of critical thinking skills but almost no useful training in research skills *outside my area of specialization*."³¹ This highlights the difference between subject knowledge (history) and archival intelligence (archives). Gordon goes on to emphasize that there are many individuals using primary sources who have had no formal training in this area of research. She clearly sees this training as the responsibility of the archivist.³² And while archival user education may have expanded since 1992 when Gordon's study was published, discussion on archival user education is still muted.

In addition to archivists, educators and psychologists have published case studies and research on the use of primary sources in educational settings. In

²⁶ Michael Stevens, "The Historian and Archival Finding Aids," *Georgia Archive* 5 (Winter 1977): 64–74.

²⁷ Wendy Duff and Penka Stoyanova, "Transforming the Crazy Quilt: Archival Displays from a Users' Point of View," *Archivaria* 45 (Spring 1998): 44–79 and Robert Spindler and Richard Pearce-Moses, "Does AMC Mean Archives Made Complicated? Patron Understanding of USMARC AMC Catalog Records," *American Archivist* 56 (Spring 1993): 330–41.

²⁸ Elizabeth Yakel, "EAD Interface Design for the User's Perspective" (paper presented at the annual meeting of the Society of American Archivists, Denver, Colo., 28 August – 3 September 2000); and Burt Altman and John R. Nemmers, "The Usability of On-line Archival Resources: The Polaris Project Finding Aid," *American Archivist* 64 (Spring / Summer 2001): 121–31. See also, Burt Altman, "Collections and Finding Aids on the World Wide Web: Will They Be Used?" *Reach Out* 2 (1996/97): 3–5.

²⁹ Conway, *Partners in Research*, 95.

³⁰ For example, see: Marcus C. Robyns, "The Archivist as Educator: Integrating Critical Thinking Skills into Historical Research Methods Instruction," *American Archivist* 64 (Fall/Winter 2001): 363–84; Ken Osborne, "Archives in the Classroom," *Archivaria* 23 (Winter 1986–87): 16–40; James W. Hopkins and Duane Reed, "Teaching Historical Methods Through the Archives: United States Air Force Academy," *Colorado Libraries* 19 (Summer 1993): 35–37; and Patricia L. Adams, "Primary Sources and Senior Citizens in the Classroom," *American Archivist* 50 (Spring 1987): 239–42.

³¹ Gordon, *Using the Nation's Documentary Heritage*, 25.

³² Gordon, *Using the Nation's Documentary Heritage*, 28–29.

the educational literature, the use of primary sources is a means of teaching writing, abstraction, or the weighing of evidence.³³ Most interesting is the literature from cognitive psychology that presents experiments demonstrating how primary sources can be used to develop critical thinking skills.³⁴ Marcus C. Robyns first introduced this research into the archival literature.³⁵ However, both the educational and the psychological literatures focus on developing expertise (e.g., critical thinking skills) with pre-selected or prepared sets of primary sources. This research is concerned with “artifactual literacy.”³⁶ We see a distinct difference between what we term user expertise or information literacy for primary sources, which is a much broader conceptualization of the knowledge and skills needed to work with primary sources, and the knowledge and skills associated with artifactual literacy. We argue that much more is needed beyond artifactual literacy to achieve true user expertise in archives, although artifactual literacy is an important component of information literacy for primary sources. While the archival literature reviewed here refers to many of the concepts pertinent to archival intelligence, these concepts (language, search, question asking, intellectual skills) have not been studied as they apply to archival researchers. The present study attempts to do just this—to look at these concepts from the point of view of twenty-eight researchers in the social sciences.

Methodology

This research is based on interviews conducted between May and December 2001 with twenty-eight individuals who had used primary sources. Subjects were recruited through flyers and advertisements in University of Michigan departments, scholarly research centers, and archives, and by word of mouth. The interview protocol employed a semistructured design. Subjects were asked the same core set of questions, but each individual was also asked other questions to probe and elucidate their statements during the interviews.

³³ For example, see John E. Stovel, “Document Analysis as a Tool to Strengthen Student Writing,” *History Teacher* 33, no. 4 (2000): 501–9; Phillip Van Fossen and James M. Shiveley, “Using the Internet to Create Primary Source Teaching Packets,” *Social Studies* 91 (November / December 2000): 244–52; and James E. Hansen II and John Newman, “Training History Students in Working Archives,” *History Teacher* 13, no. 2 (1980): 211–21.

³⁴ The principal work in this area is Sam Wineburg, *Historical Thinking and Other Unnatural Acts* (Philadelphia: Temple University Press, 2001). See also, Jean-François Rouet, M. Anne Britt, Robert A. Mason, and Charles A. Perfetti, “Using Multiple Sources of Evidence to Reason about History,” *Journal of Educational Psychology* 88 (September 1996): 478–93; and Samuel S. Wineburg, “Historical Problem Solving: A Study of the Cognitive Processes Used in the Evaluation of Documentary Pictorial Evidence,” *Journal of Educational Psychology* 83 (March 1991): 73–87.

³⁵ Robyns, “The Archivist as Educator,” *passim*.

³⁶ Randy Bass, “The Garden in the Machine,” available at <<http://www.georgetown.edu/bassr/garden.html#top>> (4 December 2002).

In general, the interviews each lasted one hour. Both authors participated in the interview process.

The subject pool represented a broad cross section of academic users of primary sources. This is not surprising, given how the subjects were recruited. Several interviewees did do archival research principally for their jobs (e.g., journalism, historic preservation architecture) or for vocational reasons (e.g., genealogy, local history); however, most were pursuing academic research projects in different fields of the social sciences. Interviewees were also ethnically diverse: twenty-one were Caucasian, three African American, three Hispanic American, and one Asian. The sex distribution was evenly split: fourteen men and fourteen women.

Experience using archives is not a surrogate for user expertise, but it is an important dimension to consider in understanding the subject pool. Two questions concerning the number of archives visited and the number of research projects conducted in archives elicited the most reliable data on archival experience. Although the subject pool drew from researchers residing in or near Ann Arbor, Michigan, the reader should not presume that this paper focuses on users of primary sources at the University of Michigan. Subjects consulted 115 separate locations housing primary sources, but this should not be interpreted as 115 different formal archival agencies. The subject pool also included researchers who used primary sources still in the possession of individuals and organizations. The term “consulted” encompassed both actual research visits as well as interactions with archives personnel using telephone, snail mail, and e-mail. The average number of formal archives consulted was 4.1. This number implies a more experienced subject pool than was actually the case. A better understanding of experience using archives is the median number of formal archives visited, which was 2. Experience can also be measured in terms of the overall number of research projects per subject. The average number of research projects was 2.8, the median, 2. Topics of research ranged from biographical inquiries to more broadly defined research questions about the evolution of social movements. Additionally, subjects were seeking records in a variety of different media, including paper, photographs, and architectural drawings. The median numbers are more representative for the sample because

Table I Archival Experience of Research Subjects

Primary Reason for Consulting Primary Sources	Totals (N=28)	Mean Number of Research Projects (N=28)	Mean Number of Archives Visited (N=28)
Academic	21	2.3	4.5
Professional	4	4.5	4
Avocational	3	1.7	1.4
Cumulative Average		2.8	4.1

one interviewee was an outlier who had consulted over twenty archives and conducted multiple projects in archives in the United States and in Western Europe.

The interviews were transcribed and entered into a qualitative analysis software application, Atlas.ti.³⁷ Atlas.ti allows researchers not only to code data but gives them the ability to establish relations and links between codes in order to search and retrieve these data in a variety of ways. This enabled the identification of themes and patterns throughout the data set. The authors then analyzed and coded these data. Interrater reliability between the two coders was checked several times during the process to ensure that the application of codes was consistent. The actual coding scheme was derived from two sources: the identification of key markers of expertise from the literature discussed above and from the interviewees themselves. The coding process was iterative. Some initial codes were either eliminated or collapsed into broader categories, and some additional coding concepts emerged from these data. Relationships between codes were developed during data analysis and are discussed in the findings.

Findings/Discussion

Three dimensions of archival intelligence emerged during coding as the most salient in terms of overall user expertise in archives. These dimensions were knowledge of archival theory, practice, and procedures; the ability to develop strategies to reduce uncertainty and ambiguity (i.e., the ability to analyze unstructured problems and identify uncertain solutions); and intellectual skills. Each of these concepts is discussed below in relation to the characteristics of experts and novice users of primary sources.

Knowledge of Archival Theory, Practice, and Procedures

Experts excel in their own domains.³⁸ A number of characteristics were identified as signifiers of expertise in knowledge of archival theory, practice, and procedures. Three of the most significant characteristics that emerged in this study were language ability and conceptual understanding of archives; internalization of the rules; and the ability to assess one's own knowledge and that of the reference archivist. These three areas cover a broad range of knowledge

³⁷ Atlas.ti began as a research project at the Technical University of Berlin and is now developed by the author, Thomas Muhr, of Scientific Software Development in Berlin. For an overview of the functions and technical capabilities, see <<http://www.atlasti.de/>> (4 December 2002). For an analysis of this software, see Christine A. Barry, "Choosing Qualitative Data Analysis Software: Atlas/ti and Nudist Compared," *Sociological Research Online* 3/3 (1998), available at <<http://www.socreson-line.org.uk/3/3/4.html>> (4 December 2002).

³⁸ Glaser and Chi, "Overview," xvii.

and skills that appear to be germane to using primary sources and navigating the institutions in which the archives are housed effectively.

Language Use

“Even the language, ‘finding aid’ is still foreign to me. Finding what, you know.” (Interview #1, lines 578–79)

The ability to correctly use archival terminology is a key indicator of domain knowledge, as this signals an internalization of not only language but also underlying concepts and meaning. Understanding archival jargon facilitates the use of various information sources, such as finding aids, guides, and archival Web sites. Additionally, language ability enables better interactions with reference personnel. Finally, language indicates an ability to distinguish between libraries and archives and to grasp differences in the access tools and information sources each provides.

The jargon of access (and with it, the identification of access tools) is a key component of archival research. Finding aids in particular are common and essential tools. Still, the term “finding aids” was not universally recognizable to interviewees, nor was their function. Terms used for finding aids included “guides,” “finding guides,” “bound collection of indexes,” and “bound journals.” This language is important because a closer examination reveals that the terminology and descriptions offered by the interviewees ranged from physical to functional descriptions. The findings indicate that novice researchers provided more physical descriptions of access tools, while more expert researchers identified their function. Novice researchers were unaware or only vaguely aware of access tools and their use, as is illustrated by the following exchange:

Interviewer: Have you looked at any of the finding aids at the [archives] for this project?

Subject: You need to tell me what finding aids are.

Interviewer: They’re the guides. Often you move from [the OPAC] to a more detailed description of collections.

Subject: I’m not even aware of that. I wasn’t told that such a thing existed. Do you do this by yourself? (Interview #23, lines 110–16)

As expertise develops, the ability to articulate the purpose and make sense of the contents of finding aids matures. One subject noted, “If I recall correctly, the paper guides had sort of the collection and the various subjects, the kinds of things that they would have within that collection” (Interview #27, lines 343–44). This contrasts with the novices who felt that they did not understand

what they were viewing. This was illustrated in this quotation from a woman recalling her reaction to a card catalog, “So you just have to go out there and look through their card catalog. And I’m sure I didn’t see half of what I needed to see just because you don’t really exactly know where to look” (Interview #12, lines 127–28).

These quotations also point out that as entire archival systems of access develop, researchers increasingly find themselves in need of understanding not just finding aids, but an interrelated and complex group of access tools. This ability to wade through a system of representations entails yet another level of expertise, and researchers struggle to attain this level of understanding. The following quotations from interviewees elucidate the nature of this struggle:

Yeah, it takes a little while and it really is complicated and sometimes very counterintuitive where things are and how they’re filed or not filed. . . . I don’t fully understand yet how it’s organized. (Interview #1, lines 58–61)

. . . it was almost all finding aids that I used . . . it was very difficult to use their system there. There’s one index that you have to go to and there’s no listing of the indexes. You have to get an archivist to show you, basically to start you off on this trail of indexes that lead to other indexes that lead to other indexes and finally you can get this bundle of letters that you’re looking for. And if you’ve done everything right you can figure out which letter it is in the bundle that you actually want to read. . . . (Interview #14, lines 113–18)

At an even higher level of understanding, some interviewees were able to critique finding aids and offer comments on contents, omissions, and suggestions for improvements. This reflected not only language acquisition, but also the ability to conceptualize and generalize about access tools and to link searching in access tools with the identification of pertinent evidence for a project. Analysis often began as a stated desire for more granularity (or detailed information) in finding aids. As expertise developed, the analysis deepened to reflections on the development of the finding aid. One interviewee made specific suggestions for improvements in finding aids, such as the ability to capture comments from previous researchers who had used the finding aid. He then noted the problems with this approach: “The other problem with expertise, the historian’s comments added to it [the finding aid], is that what the historian comments on depends on the questions he or she is asking” (Interview #3, lines 192–94).

Internalization of Rules

Archives have very specific and distinctive rules for access and use. Interviewees commented on these rules repeatedly when discussing the

differences between libraries and archives. These comments were interesting because although libraries are hardly devoid of rules, most library patrons have so internalized library rules that these rules are now taken for granted—they have become part of the background. This makes archival rules all the more striking, particularly since there may be more variation in archival rules. Just knowing or identifying the rules was an initial part of understanding the domain. Deeper knowledge of the domain came as researchers expressed an understanding as to why the rules existed:

There's all sorts of unwritten rules. You can't take your coat in there. You can't take your backpack in there. You can only use a pencil or whatever. And, you know, it's weird to walk into a place that's so library and have no books. You know, someone else goes and gets your books for you. (Interview #1, lines 466–70)

Another researcher noted the explicit teaching and learning processes that take place in regard to the archives rules:

Write with a pencil. Mark your place where your folder was. Handle photographs with gloves. You know. These all had to be learned. It wasn't like I just walked in and understood those things. Some archivists like reinforcing that culture and making sure you don't stray from them. And it's a good thing. They're in that dilemma of preserving yet sharing documents. (Interview #3, lines 502–6)

Getting used to the rules though, is more than becoming accustomed to a culture. Rules directly affected the ability to do research and often disrupted long-established research patterns and routines. Archival rules created the need to develop new research strategies and eliminated the ability to browse, a major strategy in libraries and on the Internet.

... not being able to retrieve the books myself and look through something and put it back on the shelf right away ... I mean it cuts out that aspect of discovering something not on purpose that you might get from walking through the stacks and seeing something in the general section that you're looking at and thinking like, "Wow that looks really interesting." Or quickly looking through a number of things "Oh, yea, this isn't at all what I'm looking for and being able to just put it down right away." (Interview #25, lines 384–91)

Rule acquisition was important and appeared to be a piece of the puzzle of archival intelligence. Rules need to become a part of the background in order for expertise to emerge. When the rules are new, attention is focused on the rules and not on thinking through the research problem. As the rules become routine, researchers can switch their attention to the higher-level cognitive aspects of research, and the actual use of primary sources can take the

foreground. Once the rules are learned, a researcher can devote more mental resources to thinking about the research problem and to developing specific archival research strategies.

Awareness of Knowledge: The Illusion of Omniscience

The final dimension of knowledge of archival theory, practice, and procedures is awareness of the limits of one's own archival intelligence and the ability to identify the limits of knowledge in others, particularly reference archivists. Researchers acquiring expertise were aware of their own limitations and/or the limitations of reference archivists. Correct assessments of self-knowledge and the archivist's knowledge were key to developing an accurate picture of existing limitations and to developing strategies for working around them. Several of the novices interviewed stated their confusion and frequently mentioned that they were "overwhelmed" by the archival research experience (Interviews #7, #9, #18, and #22). The more expert users demonstrated a much more refined sense of the limitations of their own knowledge:

I need to talk to the librarian and I need to rely on other people because the transfer from my prior research is not very great here and I kind of pride myself on being, knowing how to research. (Interview #16, lines 331–32)

The ability to articulate a lack of knowledge and then act on this information need appears to be a sign of researchers being able to manage the archival system and to get it to respond to their information needs.

Mary Jo Pugh noted that researchers often viewed archivists unquestioningly as experts in their collections. Comments from researchers in this study suggest a more complex attitude. Few researchers interviewed for this study considered reference archivists as all knowing, although most interviewees noted that they relied on the reference archivist and felt confident in the archivist's abilities. As one interviewee noted,

[I] don't just show up and say, "Oh, I want to find out all about blah," without thinking about where that information might be because archivists deal with myriad collections and topics and they're not going to know everything. And you need to help them help you. (Interview #12, lines 536–39)

Even if the researcher did not think the reference archivist was infallible, he or she might still rely heavily on the reference archivist.

In my experience it has been the librarian and the archivist [who] has been knowledgeable. I think that's really the key because if they're not knowledgeable, if they're just a student who is working part time who really doesn't have any in-depth knowledge, that's going to hold you up. (Interview #13, lines 283–86)

At the same time, interviewees identified gaps in the archivist's knowledge.

I have to admit that some of the times I've been at the [archives] and overheard them [reference archivists] talking to new people . . . I've sometimes wanted to jump in and say, "No, you'll find it here;" and then think "It's not my business." And I don't want to tell the archivist what to do. But maybe they're not given the kind of information they need. Some of them [have] more knowledge in certain areas. I mean they try and help. They're all really nice people up there. (Interview #12, lines 575–80)

One unanticipated finding that emerged from the interviews was that just as users overestimate the archivist's knowledge, archivists also misjudge the knowledge of users, and this overestimation can impede the search process. Several interviewees commented on this phenomenon, which was aptly characterized by one interviewee:

. . . when you're in that job [reference archivists] think people understand more than they do. They [reference archivists] don't really talk to the people like they absolutely know nothing about an archive. I sometimes feel like maybe those people leave without finding what they should have found. (Interview #12, lines 413–16)

One interviewee shared his reaction when a reference archivist overestimated his archival knowledge:

I looked in [the Integrated Library System] and I wrote down the call number on the card. And then the woman said, "Oh you have to say which box you want because this is four boxes." And then I said, "Well, I don't know I guess I'll just start with one." And then she said, "Oh there's a finding aid." (Interview #16, lines 108–11)

The mutual problem of assessing the level of archival expertise appears to be common to both archivists and researchers. For archivists in particular, the need to calibrate reference help to the researcher's level of expertise is difficult, but if it is not done it can result in a disastrous archival experience for the researcher. One researcher figured out how to demonstrate his own level of expertise to the reference archivist, thus helping the archivist to provide an answer the researcher could use.

There are different kinds of questions, some I'm very reluctant to ask, "Is there anything else I could check on this guy? You know any other sources here, any other files I've forgotten about?" That's the worst question to ask. But the questions I don't mind asking are like "Look, this guy was in the State Legislature and I cannot find a picture of him. There has to be a picture of State Legislature in the 1880's." And then I hear about the [records]. Now that kind of question I don't mind. (Interview #26, lines 494–99)

The finding that researchers have to learn how to manage the archivist is not new. Barbara C. Orbach also found that researchers approached archivists gingerly, and in fact one researcher stated, “The main key to successful research is getting the archivists to help you.”³⁹

Strategies for Reducing Uncertainty and Ambiguity in Archives: Managing Unstructured Problems and Ill-defined Solutions

Most archival inquiries represent unstructured problems. An unstructured problem is one that has “one or more parameters the values of which are left unspecified as the problem is given to the problem solving system.”⁴⁰ This is true in archives because the existence of evidence is often unknown, the access systems are complex, and/or much of the evidence requires interpretation and itself may be ambiguous. The search strategy for any given query will vary from repository to repository because of the overall differences in institutional structure, recordkeeping practices, existing records and papers, and varied access tools. For example, searching for the origin of women’s athletics at different universities would require the use of different access tools, the consultation of varying records series depending on the university, and the weighing of different types of evidence (e.g., trustees’ minutes, athletic office programs, budgets, correspondence from the Dean of Women). The best evidence in one archives may differ substantially in provenance and form from that present in another university archives. Furthermore, many archival queries result in ill-structured solutions, as sources can be interpreted and reinterpreted by numerous people.

Herbert Simon states that part of the job of the expert is in structuring these ill-structured problems.⁴¹ Over time, expert archival researchers developed tactics to reduce the amount of ambiguity and uncertainty surrounding working with primary sources. We operationalized tactics for reducing ambiguity and uncertainty in two ways. First, we identified a researcher’s ability to develop search tactics as a means of measuring his or her ability to structure ill-structured problems. Second, the art of question asking or asking the right questions (as opposed to question-answering ability on the part of the reference archivist) was studied as a means by which researchers reduced uncertainty.

³⁹ Barbara C. Orbach, “The View from the Researcher’s Desk: Historian’s Perceptions of Research and Repositories,” *American Archivist* 54 (Winter 1991): 37.

⁴⁰ Walter R. Reitman, *Cognition and Thought* (New York: Wiley, 1965), 141.

⁴¹ Herbert Simon, “The Structure of Ill-Structured Problems,” *Artificial Intelligence* 4 (1983): 187.

Search Tactics

The search process is a means of structuring ill-structured problems because it helps to both identify and rule out primary source materials. Still, one interviewee characterized the unstructured nature of the archival search process as having vague beginning and ending points:

[In] Internet searches . . . there's always a sense . . . how do you know you've gotten all of it? . . . perhaps the archivist has simply directed you toward one chunk and you're missing out on a lot of other things that go along with it. So that's kind of how I remember feeling . . . until I realized that you always feel that way. (Interview #3, lines 134–38)

Another researcher appeared more frustrated with the uncertainty and ambiguity in the archival research process:

You know the trouble with the [archives] is that you go to the card catalog, now [the ILS] and you look up things and you think you've got it all and you don't. You haven't even begun to scratch the surface because they have all these little places where they have information that they, I mean you don't even know there's more information so you can't ask for it. (Interview #26, lines 142–46.)

More expert researchers exhibited knowledge of the archives as part of their search tactics. These individuals were able to connect the research problem to the search environment. One expert archival researcher described his search tactics through the series of questions he asks himself:

I would say I ask myself, "Who else would have an interest in knowing this information, and having this information?" And trying to think as broadly as possible, you know if I was a person in 1973 looking at the problem of the [transportation system], why or why not would I care about it? And how it relates, or how would I file it too? Because it might be under economic, if I were filing it like under economic development. It might be under regional unemployment, transportation is the obvious one. It might be under government regulation. And so forth. So there's a lot of people who might be interested in it. And then I also have to think too, when I'm searching for, who would have the information that I'm looking for? And who would have perhaps the most relevance? Because looking at a finding aid, you might find a folder and the folder might have one page in there of a letter they got from somebody, that's totally irrelevant. (Interview #6, lines 288–98)

Another expert researcher phrased one of his search strategies in terms of understanding the functions and bureaucracy of the institution that he was studying.

To me the most important thing that you don't get from finding aids . . . is what I call bureaucratic reverse engineering. . . . Once you get the Weberian

style bureaucracies emerging when you've got cc's to several people on your document the notion of unique documents, single copies of documents pretty much goes by the wayside. . . . And if you can't get access to one copy you can try access to another or if one copy was gone you can find another. (Interview #17, lines 570–76)

It may strike readers that both of the last two researchers were doing a functional analysis and relying on provenance to structure their search. Yet, when asked if they recognized the term “provenance,” neither could define the term well in an archival sense although they were familiar with the word.

As noted previously, one novice researcher/interviewee conceptualized the search process as having vague beginning and ending points. More expert archival users reduced uncertainty by identifying a key source that had a proven track record of leading the researcher to other pieces of information as a starting point for the search process.

So I could go and look at all the newspapers and I could go and look in different boxes. Then I could look at different collections. That kind of led me to research financial archives. (Interview #24, lines 733–35)

The importance of entering any archives with a place to begin cannot be overstated. This appeared to be a means by which researchers established a modicum of control over the environment and independence from the reference archivist. This also gave the researcher time by creating a space from which to reconnoiter the archives on one's own terms by providing a safe harbor or known place from which to begin and get oriented to such things as access tools and repository rules. The importance of a starting place is described by one subject:

And they're [colleagues] going to say, “Well, I know for example that at [the archives] they have a collection on this.” And when you go to the [archives] you go straight to that collection. It gets you a starting place. There's also something to a starting place I think that you just get into it. I've done that a few times where I was like, “I don't know what's all in here. But I'm just going to start somewhere just to get a lay of the land . . . how this archives' procedures are and that kind of thing.” (Interview #3, lines 282–88)

The significance of preparing for an archival visit is discussed below, but knowing in advance where one will begin and extending one's search from there appears to be a major way to reduce uncertainty. Interviewees in this study located a starting point using a variety of sources: colleagues, citations, past experience with the collections, and talking to the reference archivist on the telephone or through e-mail before arriving. In addition to identifying a place to begin the search, the interviewee in the previous quotation also uses this tactic as a means to familiarize himself with the particular rules and procedures of a repository.

Question Asking

Asking the right questions is key to getting good answers. The ability to ask good questions in an archives or of archivists is not innate, despite what one researcher said about a friend: "There are other people I don't know how they learn it . . . and he was just born good. . . . He's good talking to archivists and learning collections" (Interview #24, lines 735–39). As noted above, numerous articles have advised reference archivists how to negotiate questions during the reference interview. Researchers, too, need practice in formulating questions for archivists and in knowing when to ask questions. Without this skill, in the words of one interviewee, "It can be a little daunting if you go into an archive for the first time and you don't have a clue what to ask or where to look" (Interview #12, lines 409–11).

This was echoed by another less expert researcher who understood too late the value of questions in reducing uncertainty and in guiding the research process. This researcher regretted the fact that he was reluctant to ask questions:

I'm the kind of person who'll just go out on their own and not ask any initial questions or anything. And I think I might waste time, and I think I might've wasted, I probably wasted some time not asking people up front about different things or such. But I'd say if you just have a problem or a question go ahead and ask it. You'll probably cut some time off of the end if you do that. . . . So I think just ask the people who are working in archives or the library, whatever, if you ever come up across any problems. (Interview #9, lines 415–23)

The need for the researcher to prepare for question asking by making an explicit demonstration of knowledge, and perhaps even direction, was iterated by other interviewees:

Unless I knew what was in there, what was in this collection, had done some advance knowledge about it, I wouldn't know what to ask the reference librarian. I don't want to use the word "gatekeeper" but it seemed like that person was who I had to go through and it seemed to be a waste of time to say "Well, what do you got here? What would interest me?" . . . rather than saying, "I'm looking for such and such. Could you help me find it?" (Interview #11, lines 159–64)

One researcher demonstrated both sensitivity to question asking and an ability to assess the knowledge of the reference archivist:

I think I know when they're [reference archivists] not understanding me and I have learned how to direct them. You know, for example, I think that maybe in the first few moments at [an archives] this person [the reference archivist] was not quite with it in terms of what I was telling him. Once I mentioned a couple of email exchanges with his boss and more specifically what my

project was, he became a little more helpful and on target . . . it became evident to him, I think, that I knew a little bit more about the history of [the institution] than he did . . . because I was prepared for [indecipherable]. (Interview #1, lines 509–17)

Bearman's article on user presentation language did not really get at the importance of question asking from the point of view of the researcher.⁴² One interviewee carefully thought out his question-asking strategy and presentation style:

I think basically if I start with a brief background of what I'm trying to do, where I've been, and what my plan of attack is from there then that allows them [reference archivists] to follow that train of thought, hopefully. And then they can interject at that point and suggest any modifications or you're going to double back on what you did or something like that. It's worked so far. (Interview #13, lines 157–60)

Researchers did think about how to get desired responses from archivists and, as in the quotation from Interview #1, were able to assess when a reference interaction was not going well so they could adjust their tactics.

Intellective Skills

Intellective skills encompass the ability to understand representations of documents, activities, and processes.⁴³ These skills are an important part of the development of an overall framework for problem solving, which is a core dimension of expertise. Several dimensions of intellective skills emerged from the interviews. A salient characteristic, though, was the ability to plan for and create an overall research strategy to identify and then use primary sources. In doing this, the researcher had to make meaningful connections while progressing through the research process and had to develop the ability to act on those meaningful connections. These characteristics are illustrated by two behaviors: preparation as a means of framing the search process and understanding how the surrogate leads to or represents a primary source.

Preparation

Preparation is a dimension of intellective skills, and planning ahead is indicative of a research strategy that relies on the prior development of a framework for working with primary sources. As discussed above, experts entered an

⁴² Bearman, "User Presentation Language in Archives," *passim*.

⁴³ Zuboff, *In the Age of the Smart Machine*, 75–80.

archives or manuscript repository with a clearer idea of where to begin. Novices appear to be unable to make these connections and often enter archives unprepared, lacking both a well-defined research strategy and any prior knowledge of the archives. In the following example, a novice researcher interested in a picture of her house entered the archives and faced immediate confusion.

So when I got there I kind of looked around trying to figure out, "OK, now what do I do?" And then I asked somebody and they said, "Well, there's really no way of us being able to help you, you just kind of have to look through these kind of card catalog things and see if possibly that may be a good source. And if it is a good source then if it is a good source then we have to go get it for you." So I did that for like two hours and essentially got nowhere. And never actually have been able to look up anything, because I just didn't, it was too mammoth of a past. (Interview #7, lines 20–27)

In a second example, a slightly more experienced genealogical researcher who checked the rules (hours, location, direction) arrived without a research strategy. However, this researcher perseveres and after a couple of days figures out a research strategy.

I think it makes sense the way that they have it organized. I think towards the beginning of all these cabinets, they had the [city] telephone books from the early 1900s. So you can get an idea of the address, which helps you for certain census years. . . . So they first have the telephone book microfilm rolls and then they have the census information. And then it moves on to maybe naturalization or shipping records. And it's all sort of in chronological order and it made sense. And the indexes, once I understood what was going on, they all made sense. But it wasn't completely apparent at all from the start. (Interview #10, lines 347–53)

One interviewee came to recognize the relationship between the lack of even basic preparation (rule review) and his ability to pursue an effective research strategy.

But I couldn't do as much as I wanted to just because I didn't know what to prepare for. And if I'd known ahead how much time it was going to take, or their procedures at some of these places, I would have built in extra days. And I know I didn't do adequate research because I didn't have the time and they weren't prepared to have me there more than a day. (Interview #12, lines 493–97)

At the other end of the spectrum, calling the reference archivist, checking the repository's Internet site, and reading secondary sources were key preparatory activities as evidenced in the quotations below.

I start, first I guess by calling folks at the archive itself and asking them generally where I can look sort of online to sort of prepare myself and what things

are available at that archive. And when I figure out what collections they have . . . what might be useful to me I just go there. And then when I get there I ask the reference librarian to tell me what the various collections are all about. I sense that just from these two [archives] alone that different archivists do things differently . . . so I have to sort of be sensitive to that . . . and ask them “So how do you do things here? How do I get a hold of these things?” (Interview #27, lines 46–52)

Before I waste a trip to an archive, [one strategy] is to see if they’re going to have stuff that I want. And also I’ve found that the Internet allows you to look at finding aids and then you can, with the finding aids kind of plan your visit a little more efficiently. Since there’s a wait time between requesting a sessions [series ?] or boxes and when you actually receive those. When I get there, one thing initially was to ask the archivist or the curator to assist me, and I’ve found that often times leads to irrelevant conversations about all the possible directions I could go to. So I kind of prefer to operate independent of the archivists, which may not be the best way to go about it but it’s, it’s how I’ve kind of approached it more recently. And when I have more specific questions they can be quite helpful. I like to get the lay of the land. I’ve tried to kind of look at the finding aids if they’re shelved in a way that I can access them without making requests to see how does this archive, what do they have first of all, because it’s hard to, you know, even get a sense. I’ve been to about to six or seven archives. Each one is quite different in how they organize things. (Interview #3, lines 34–47)

Understanding the Representational Relationship

Understanding the nature of the representational relationship between surrogates and primary sources is a central dimension of researcher expertise. For novices, this ability to visualize the connection was lacking. This excerpt from an interview with a researcher mired in a card catalog and looking for a photograph of her house illustrated this point:

[I needed someone to] help me understand what I was looking at. . . . I would have personally liked to look through the pictures, because it’s just, because then I know I’m getting close. Because you’re looking at this card and you’re going, “This could be it and it couldn’t be.” And then I felt like I was being a pain to have them [archivists] go get this to see if I was even, that what I was understanding on a card, was it really what I was going to see. I’m so visual that when I’m reading something, unless I actually see it, I’m not making that connection. (Interview #7, lines 207–16)

Researchers with more expertise were able to make the connection between surrogates and primary sources and sometimes did this quite purposefully to understand the representational strategy (descriptive practices) in a repository.

One of the tasks was to determine how the finding aid that was developed compared to what was in the contents of the archives. So I actually searched one collection, small collection, and went through all of the boxes of the collection looking at what, getting a feel for what was in there and comparing that to the finding aid. And doing [a] . . . quality sort of review of what was on the finding aid versus what was actually in the collection. (Interview #11, lines 17–21)

The ability to distinguish between surrogates and their relationships to the actual records is yet another level of expertise.

And the ones I remember using the most are [from] the [archives]. I think most of their finding aids online, and then when I got there and saw them [finding aids] all on a book shelf about this size. That helped too, just to be able to see how big is this that whatever I saw online before driving down there was exactly what I was seeing in front of me. So that was really nice to be able to see the two things like that. But then to actually open it up I certainly used the text there to help me filter through it [the actual collection] all. (Interview #3, lines 177–83)

An even higher level of researcher expertise was evidenced when a researcher recognized that the relationship between the surrogate and the primary sources was not working and developed an alternative strategy. The ability to develop workarounds signifies knowledge of the archival system as well as an understanding of how the surrogate-primary source relationship should have worked. In the following example, the researcher realized that the finding aid was very general and that he needed someone to provide better access to the collection or he would be randomly paging unnecessary boxes for a long time.

When looking at the [governor's] collection, it was so huge that it was a little bit unclear, about how the organization was at first. Until I got more familiar with it [the finding aid], looking at the patterns that evolved. At the same time I found that the [archives] finding aids really aren't specific enough. Just pointing me more toward a range of boxes. It's about a range of a hundred boxes or so in one collection, as opposed to pointing toward individuals. Basically [what] I'm looking at . . . are transcripts from a hearing, that were held throughout the state. Throughout the northeastern states in 1973, 1974. And they are not arranged by states, they just basically point to range of boxes. So the way I found out the boxes I needed, is I talked with the head archivist who actually took me out to the stacks. And went through the boxes and said, "Ok, these are the [state] boxes, these fifteen boxes or so." (Interview #6, lines 185–95)

The ability to visualize collections through representations is becoming more important as the numbers of surrogates increases. This is particularly true since researchers may encounter multiple different on-line representations for

the same record group or collection. For example, at the University of Michigan, researchers can potentially access five separate representations of the same collection of primary sources at two separate levels of granularity (both MARC records and EAD) through OCLC, RLIN, and the local digital library by going through the official library gateway; and through the Library of Congress. What researchers make of these increasingly complex and overlapping archival access systems is unknown, but will become an increasingly important part of archival intelligence in the future.

Implications for Archival User Education

I guess my experience at public libraries is usually the people who work there are, I think they think it's part of their job to really help you out. . . . They're more helpful at the public library. Whereas at the archives it seems like there's this culture of, most people there totally know how to do everything and they are there, they seem to be fine with helping the regulars get whatever, you know microfilm rolls or whatever that they need. But it doesn't seem to be about teaching you how to use the archives. You're expected to just know. You know what I mean? So you walk in there and I mean it seems like there's a culture of expected expertise. (Interview #10, lines 309–16)

In many cases, archival user education is still referred to as archival orientation. Archivists need to think about the underlying significance of this terminology as they focus on archival user education programs. Furthermore, archivists need to define what would be entailed in a program of information literacy for primary sources that could help researchers to develop archival intelligence. A movement away from a focus on “how to do research here” toward a more conceptual understanding of archives and search strategies may provide users with more knowledge and the ability to develop intellectual skills to navigate multiple repositories and better identify primary sources from afar.

Our findings in this study indicate that information literacy for primary sources would entail reconceptualizing the one-shot archival orientation class into a broader and deeper curriculum. Expertise cannot be fostered through a single class. Archival intelligence is something that needs to be imparted over time and is a continuous process, even for longstanding and repeat users of primary sources. Several interviewees who were repeat users of an archives noted that they had not kept up with current developments and that these were not routinely pointed out to them, particularly the different types of networked representations now available. As one interviewee noted, “I think after awhile they just assume I know the ropes or I should know the ropes. And I should know the ropes except that I forget the ropes” (Interview #26, lines 183–84).

Archival user education needs to expand beyond imparting knowledge about the local archives, to teaching the vocabulary of archives and the

meaning embedded in that vocabulary including higher-level archival concepts such as provenance and functional analysis. Instruction in formulating search strategies to reduce ambiguity and developing tactics for navigating analog and digital access tools is also a critical element in archival literacy. Finally, researchers need to understand the primary source representation relationship. One of our interviewees noted:

Other colleagues in . . . history when I was in graduate school were told how to do note cards and how to keep track of note cards. But they weren't taught much at all about finding aids. It doesn't get taught by faculty, by history faculty. (Interview #17, lines 449–51)

Unlike Michael Stevens's 1977 conclusions, our findings indicate that researchers are using finding aids, albeit ineffectively.⁴⁴ Even those researchers who had mastered an access system and made the connection between MARC records and finding aids did not seem particularly comfortable with using these tools. Archival user education—we purposely avoid the term archival orientation—needs rethinking and its content needs more careful consideration to meet the needs of today's archival researchers.

Conclusion

Developing information literacy for primary sources is difficult. This may be because it involves three separate types of expertise: subject knowledge, artifactual literacy, and archival intelligence. Furthermore, archivists cannot help users in all of these areas. Archivists can, however, more fully envision archival user education to include all aspects of archival intelligence. This paper has examined three areas that comprise archival intelligence: archival intelligence, strategies to reduce uncertainty and ambiguity, and intellectual skills and discussed how each relates to user expertise in archival research. Within each of these areas we have identified characteristics that reveal expertise. While we stand by these areas, in no way do we claim that these are the only areas necessary for archival intelligence; nor are the elements we associated with each area the only possible characteristics that can be linked to these major areas. More studies are needed to identify additional components of a curriculum that promotes information literacy in primary sources. What we have attempted to do is to begin to define user expertise by identifying salient characteristics revealed in our analysis and to suggest targeted ways to foster the development of expertise in novices and to reinforce and extend the archival intelligence of expert users of primary sources.

⁴⁴ Stevens, "The Historian and Archival Finding Aids," 69–70.