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College & Research Libraries continues to rely on the contributed time of many Association of College and Research Libraries members who serve as authors, book reviewers, referees, editorial board members, and editors. I thank them for their continuing commitment to the journal. I also want to thank those members whose survey responses showed that 87 percent of ACRL members think C&RL is an important or very important benefit of association membership.

Martha Bright Anandakrishnan has served as the editorial assistant from January 1993 to January 1995. She has displayed great skill in working with authors, a keen sense of language, and a deep respect for individual expression. Larry Oberg, the Research Notes editor, and Stephen Lehmann and Bob Walther, the Book Review editors, continue to refine their portions of the journal and to work with me to create the whole. Eldon W. Tamblyn produces our fine annual index. Next year he will be ably assisted by Kathy L. Dusky, who will be his successor. This team conquers distance to coordinate the production of each issue.

ACRL support continues at a high level from the Board of the Association and from key staff members Althea Jenkins, Mary Ellen Davis, and Hugh Thompson. The ACRL Publications Committee provides a strong base of support for this effort. Karen Siebert’s leadership as the Chair has been especially appreciated. Josephine Sharif and Bruce Frausto of ALA Publishing handle the actual production, providing a high standard of text and graphics.

The Pennsylvania State University provided equipment and wage support for three years from a fund to aid women and minorities. Currently, Penn State Libraries pays the editorial assistant and contributes much of the editor’s time. In addition, my colleague Ronald F. Dow often serves as a sounding board for a variety of day-to-day conundrums.

The C&RL Editorial Board semiannually produces more good ideas than can be acted upon. In addition, one of them reviews each manuscript submitted for publication. This year, additional review work has been done by these academic librarians:

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Editorial

Rewards of Editing C&RL

In the September, October, and November issues of *C&RL News*, the Association of College and Research Libraries published an advertisement for the C&RL editor’s position. The new editor should be chosen by next annual conference and will have a year to learn the duties and to begin referring submissions. The new editor will assume office after annual conference in 1996. “No one will do this for the $400 honorarium,” quipped Don Riggs.

I edit *C&RL* for love — love of librarianship in particular, the scholarly process in general, and good thinking and writing in both. The ideas, the people, and the institutional benefits, and even the pressures have made these past four and a half years an extraordinarily gratifying experience, one that I would recommend to others.

**Ideas:** The manuscripts that undergo the refereeing process for possible publication in *College & Research Libraries* contain the best and most provocative ideas about the theory, the practice, and the future of librarianship. Through these ideas, the profession moves itself forward in an environment of increasingly rapid change. Without the continued research into new approaches and responses to practical problems, librarians will go the way of compositors and typefounders. Editing *C&RL* has provided me with an intimate view of the action on the intellectual network and with an opportunity to shape that action.

**People:** Even more than working with ideas and their expression, editing *C&RL* has been about relationships with the people who create, critique, and clarify those ideas. Authors, referees, and only finally editors create this journal; I have especially enjoyed working with the authors whose desire to share their knowledge creates the network of ideas, and with the ACRL leadership who support the journal as a vehicle for improving the profession through research.

**Institutional relationship:** Academic institutions value highly the creation and transmission of knowledge through scholarly journals. Participation in that activity underscores librarianship’s commonality with other disciplines. Penn State University’s Dean Nancy Cline comments: “It has been rewarding to have the editorship of *C&RL* based at Penn State. The librarians here are very active in professional organizations and conferences, and they contribute to many publications. Engaging many of our faculty in the review process has resulted in a better understanding of how one’s scholarship progresses from a good idea to a published article. It has also given librarians a chance to see how important the refereeing process is. In her editorship, Gloriana St. Clair has taken the opportunity to involve many other librarians so that they can learn of the rewards as well as the problems faced in producing a high quality journal. We are proud of this contribution to ALA and hope that other institutions will benefit from hosting *C&RL* as much as we have.”

**Pressures:** Editing *C&RL* does have its more trying moments. The ACRL Board’s plan to save money by cutting back to four issues a year was the nadir of my term. Strong assistance from the *C&RL* Editorial Board and the ACRL Publications Committee convinced them to reconsider, and the fiscal crisis passed.
The time schedule to produce six issues a year is relentless. Two-thirds of all submissions must be rejected to squeeze into the existing page constraints. Time from submission to publication is lengthy, as is common with highly ranked journals in most disciplines. Nevertheless, the regular delivery of a selection of fine articles and book reviews to ACRL members has been a source of genuine pride and pleasure.

Perhaps a new editor will be able to avoid some of these pressures. That person will also have significant new challenges: analyzing the efficacy and suitability of electronic publication, developing methods to achieve a quicker response time, and working toward a clearer articulation of the journal's relevance to the practice of academic librarianship. ACRL members interested in undertaking this weighty but satisfying responsibility should contact the editor for further details or send their credentials directly to the ACRL Office to the attention of Hugh Thompson.

In keeping with this editor's emphasis on diversifying the editorial voice by having Board members write editorials, Board member Irene Hoadley suggested that former C&RL editors be asked to contribute to this discussion of the rewards of the editorship. Subsequently, I contacted former editors and received these recollections of their service as C&RL editor.

David Kaser, the 1963-69 editor, recalls: "The principal personal benefit I received from my editorship of C&RL was that for seven years I was able to read not only articles that we accepted for publication—I would have read those even if I had not been editor—but also the papers that were not accepted for publication. Even the papers we had to reject contained invaluable insights, concepts, observations, and ideas, and I always regretted that I was the only librarian on earth who was blessed to read and learn from them all."

Richard M. Dougherty, who edited C&RL from 1969 to 1974, says: "My decision to become C&RL's editor was one of the most important decisions I ever made. It changed my professional career. I became much more involved in all aspects of academic librarianship and as editor I felt that I was involved in important activities. It was a heady experience and I recommend the post to any aspiring academic librarian. But don't let anyone fool you into believing that the responsibilities will only require a modest commitment. Be prepared to work and work hard, but also be prepared to reap giant satisfactions."

Richard D. Johnson, editor from 1974 to 1980, remembers editing C&RL as "the most stimulating association I have had in my professional career . . . . What I learned in those years about libraries, about writing, about editing, about publishing; the wonderful friends and acquaintances I enjoyed; the sense of making a contribution to the profession—all these elements contributed to a superb experience."

Jim Schmidt, editor from 1980 to 1984, writes: "There are two wonderful memories of my four-year term as editor of C&RL. The first and more important one is working with authors. Without exception, article writers were agreeable and easy to work with . . . . My second memory is the fun I had in redesigning C&RL. The designer was a pleasure to work with, and my Editorial Board made several creative suggestions . . . . In both memories I believe I enjoyed the vast good will which exists among librarians generally and academic librarians in particular."

Charles Martell, 1984–1990, says: "Academic librarianship has turned a historic corner. Some of this has been facilitated by our colleagues who are engaged in creating a new vision or who are looking for new paths to travel. Increasingly librarians are demonstrating a renewed energy and vitality. This is the world that the new editor of C&RL will be privileged to participate in and influence. The new editor will, I hope, be overwhelmed by our outpouring of ideas. The new editor will help us to present these to our colleagues in the most effective way possible. It's quite a task, a wonderful task."
This distinguished editorship has been a most rewarding avocation for its incumbents. It provides the immortality that has motivated scholars in all fields—the contribution is from the past, for today, and for the ages. Beyond any honorarium, the moment of pulling the personal subscription copy from my home mailbox is a moment of joy.

GLORIANA ST. CLAIR

APPLICATIONS/NOMINATIONS INVITED FOR C&RL EDITOR

Applications and nominations are invited for the position of editor of COLLEGE & RESEARCH LIBRARIES (C&RL), the bimonthly, scholarly research journal of the Association of College and Research Libraries (ACRL). The editor is appointed for a three-year term which may be renewed for an additional three years. Applicants must be members of ALA and ACRL. Qualifications include professional experience in academic libraries, a record of scholarly publication, editing experience, an understanding of the scholarly communication process, and a broad knowledge of the issues confronting academic libraries.

Some funding for editorial assistance is available, and there is a small honorarium for the editor.

Appointment will be made by the ACRL Board of Directors at the 1995 Annual Conference, upon the recommendation of the search committee and of the ACRL Publications Committee. The incoming editor will assume full responsibility for C&RL in July 1996, after a year working with the out-going editor.

Nominations, or resumes and letters of application including the names of three references, should be sent to:

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Patron Online Catalog Success
Rosemary Thorne and Jo Bell Whitlatch

This project explored the role of the online catalog in library user success. Three different studies were conducted to provide a more in-depth picture of online catalog use in three aspects of library research—as part of the reference process, as used by unassisted users, and as an intermediate step in obtaining actual documents. The methodology provides a model for surveying other library services or products.

Automated products, especially online catalogs, have become the norm in academic libraries. The online catalog is now a major resource utilized in the process of providing reference assistance to users and in providing assistance to library users operating in a self-service mode. Librarians and library users alike have adopted them enthusiastically. Although user enthusiasm and satisfaction with online catalogs are known to be high, individual libraries have more limited information on the role of the library catalog in library user success. To obtain a more comprehensive understanding of the role of the online catalog in user success, individual library studies must be designed to study both patrons who use the online catalog with reference assistance and those who use the catalog unassisted. Also, such studies must employ a variety of quantitative and qualitative data-collection methods and analyses and consider both librarian and patron perspectives concerning success.

The purpose of this project is to explore how the online catalog contributes, or does not contribute, to patron success. This project, in using a variety of methodologies, also seeks a multifaceted view of the topic. Key questions that the project is designed to answer are: (1) Are students really getting appropriate assistance when using the online catalog? (2) What are the most common searching successes and failures observed for people using the online catalog without staff assistance? (3) How effectively is the online catalog used by librarians providing reference assistance compared to other sources—reference books, electronic and printed indexes? and (4) Are students able to find the material they located in the online catalog on the shelves—if not, why not?

The paper briefly reviews relevant studies of online catalogs and reference success, and describes the methodology and results of three different online catalog studies: (1) the Reference Transaction Assessment Survey; (2) the online catalog study of unassisted users; and (3) the document availability study. Finally, the paper concludes by discussing the implications for reference practice.
for the online catalog interface, and for study methodology.

LITERATURE REVIEW

Online Catalog Studies

Many studies have been conducted concerning the role of online catalogs in providing assistance to users in a self-service mode. Jon Hufford observes that the most accurate studies of catalog use have been done through interviews with users when they are searching the catalog. This technique requires more time to gather data, but is likely to yield more precise and reliable information. A serious limitation of this method is that users might not behave in the same way as when they are unobserved. In line with this focus on users, Walt Crawford notes that much of the research has asked the wrong question. The question is not whether users can identify a given piece of information, but whether they got the information wanted, how quickly they got the information, and whether the process was satisfactory.

However, user satisfaction as a measure is not without difficulties. User satisfaction is multidimensional, and there has been little recognition of the complex dimensions that underlie the measure. Prudence Dalrymple and Douglas Zweizig found that users who spent a longer time searching the catalog were likely to assess the results obtained less positively than those who spent a shorter time searching. Conversely, users who enjoyed their experience searching in the online catalog (easier to use, fun, and so forth) viewed the results obtained more positively than those who found the online catalog search less enjoyable.

Past studies of online catalogs have identified subject rather than known-item (author/title) searches as the type of searches creating the most difficulties for users. Ray Larson has summarized the major problems with subject access in current online catalogs: users' lack of knowledge of Library of Congress Subject Headings (LCSH); users' problems with mechanical and conceptual aspects of query formulation; searches that retrieve nothing; searches that retrieve too much; and searches that retrieve records that do not match what the user had in mind. Larson found that subject searching is the type of search most likely to fail—in a large university library, only 12 percent of subject searches retrieved between one and twenty items. Other recent studies confirm Larson's observation. At North Carolina State, Hunter found that subject searching was the most used (at 52 percent) but the least successful search—62 percent of all subject searches resulted in zero hits. In November 1992, 32 percent of searches on MELVYL, the University of California online catalog, yielded zero retrievals and the average retrieval set was ninety-eight titles.

User satisfaction is multidimensional, and there has been little recognition of the complex dimensions that underlie the measure.

A few studies provide more detail on user behaviors when subject searching. Methods of uncontrolled vocabulary (i.e., keyword) access vary among online catalog systems, making it difficult to compare results of subject searches from different systems. In a system that did not provide keyword access to controlled vocabulary subject headings, Thomas Peters and Martin Kurth found that over 58 percent of users began with an uncontrolled attempt. Slightly less than half of subject search sessions also contained at least one title keyword search statement. In a study at the University of Toronto Libraries, observers recorded protocols for one hundred online catalog search sessions. An analysis of 42 zero hit searches revealed that keyword subject, keyword title, or title searches using the original query from the user's zero hit subject search were more fruitful than new searches constructed from cross-references provided by LCSH. Joan Cherry suggests that LCSH cross-references in online catalog or user training in use of LCSH will not
solve the problems with the majority of zero hit subject searches. A more promising approach may be to provide online catalog software that converts zero hit subject queries to other types of subject searches.  

Studies of Reference Success

The role of the online catalog in providing reference assistance to users has not been evaluated extensively. However, Charles Bunge, Marjorie Murfin, and Gary Gugelchuk have developed the Reference Transaction Assessment Instrument (RTAI), which provides an opportunity to assess the effectiveness of the online catalog as a resource in providing reference assistance to users. The RTAI has been judged reliable and valid, has been utilized by many libraries evaluating reference services, and contains a section that provides information on whether the catalog was used in the process of answering a reference query. In an analysis of preliminary results from the RTAI, two factors have emerged that appeared to undermine the results of reference service seriously. One factor was that the librarian was too busy and the other concerned the librarian’s practice (either from habit or necessity) of directing or suggesting only rather than helping with the search. As a result of analyzing data combined from many individual libraries, this syndrome of factors has been identified as characteristic of the least successful libraries: significantly more directing rather than actually helping users with searches, significantly more transactions of two minutes or less, significantly more one-source transactions, significantly more reports from users that they did not receive enough time or help, significantly more communication difficulties with librarians reported by users, and significantly less agreement on patron success by librarians and users— that is, lower sensitivity to user feelings by librarians.

METHODOLOGY

The University Library at San Jose State University serves approximately thirty thousand students, a significant percentage of whom are members of diverse social and ethnic groups, including persons with disabilities, African Americans, Hispanics, Asians, first-generation college students, and older returning adult students. The campus has two library facilities: Clark Library, which houses current collections and most library services, and Wahlquist Library, which holds older research materials, reserves, and special collections. Library collections include more than 900,000 volumes and 3,127 periodical subscriptions. Located in urbanized, high-technology Silicon Valley, the university is a member of the twenty-campus California State University system.

The library introduced its first online catalog, an Innovative Interfaces product, to the public in April 1991. Remote access to the catalog was made available through the campus computer center. Access by title and subject keyword and permuted subject heading was available following an upgrade in fall 1991. Prior to the introduction of the online catalog, patrons were able to use several public terminals to search the CLSI circulation system by author, title, and title algorithm. In January 1992 the library withdrew its card catalog, which had been closed in November 1990.

For the project, three studies were undertaken. The first study used the Reference Transaction Assessment Instrument (RTAI). This was followed by the Online Catalog Success Study, which was conducted concurrently with the Document Availability Study.

Reference Transaction Assessment Instrument (RTAI)

In spring 1992 the RTAI survey was used to collect information on success in reference and information seeking, as perceived by both the patron and the library staff member. The authors secured the cooperation of the Reference Department and the Government Publications Department in carrying out the survey. Paired response forms for the patron and the staff member (librarian, support staff, or student assistant)
permitted the surveyors to examine the response to the transaction from the viewpoint of both sides of the service desk. Separate standardized forms were provided for directional/information queries and for reference questions. For a copy of the RTAI questions, readers should consult the article published in *College & Research Libraries* by Marjorie Murfin and Gary Gugelchuk. A useful feature of the RTAI was comparative data provided for other academic libraries that have participated in the RTAI. In our analysis, we will refer to the results for academic libraries of similar size for comparison purposes. The authors used a total of 300 forms, 150 each for directional/information and reference questions. For RTAI sample size, Gary Gugelchuk recommends one hundred sequential transactions. His study showed that with a 95 percent confidence level for a sample size of one hundred items per sample, the true success score for a library will lie within plus or minus ten percentage points of the sample observation.

The twenty-four librarians and para-professionals in the Reference and Government Publications departments participated in one-hour training sessions. These included a review of the logistics of the survey—schedule; where to place completed forms, etc.; review of definitions of terms; review of each questionnaire, question by question, using sample reference questions as examples; and clarification of any questions arising during the training. Each staff member was given a test set of forms, with the recommendation that they review them while at the service desk to further familiarize themselves with the forms and the process. Training for student assistant supervisors was very important, because these individuals trained the student assistants.

The survey was conducted during the third week in April, a time of the semester when library activity is high. Times were chosen to include at least one morning, one afternoon, one evening, and one weekend day. Signs informing patrons of "Survey in Progress" were posted at each service area. Each staff member participating in the survey informed the library patrons of the survey, asked for their participation, and handed out the form with a #2 pencil. Clearly marked boxes for forms were pointed out; these boxes were located sufficient distance from the service desk that patrons could maintain a feeling of privacy in their responses.

All surveys were completed during this period. Completed survey forms were mailed to the School of Library and Information Studies, University of Wisconsin-Madison. The most cost-effective method of utilizing the RTAI forms was to order copies from Charles Bunge at the School of Library and Information Studies, University of Wisconsin-Madison. Prices included data processing and printing results. Comparative data from other libraries were supplied as well. The computer-generated results, with comparisons with other libraries, were returned by mail.

**Online Catalog Study of Unassisted Users**

The purpose of the Online Catalog Study was to learn more about the successes and failures of people using the online catalog without staff assistance. A set of instruments was developed by the authors, including an interview/observation section and a brief questionnaire for the patron. Also, a document availability form developed by Paul Kantor was utilized as part of the study. The three forms used in this survey were in numbered packets, which permitted comparison of the information on all three forms for the same observation.

The librarian form asked observers to note the various online indexes (author, title, keyword, etc.) used by the patron, the order in which these were selected, and the level of difficulty the patron appeared to have in using them. Librarians were also asked to record the use of the various display options and limit commands, as well as other special features of the catalog, and starting and ending times for each patron search observed.

The patron questionnaire asked the patrons to evaluate their experience, in-
cluding success in locating what was needed, type of material sought, level of satisfaction, and perceived ease of use of the online catalog. A five-level ranking of success, similar to that used in the RTAI survey instrument, was used for appropriate questions. A final question asked for suggestions to improve the online catalog.

The document availability form, "Did You Find It?" asked participants to use the sheet as "scratch paper" to note what they found in the catalog and wished to look for in the library. In addition to space for the author/title/journal name and call number, the form asked users to mark whether they found the item. Additional questions concerned the urgency of their need for the material, their perception of their success in finding materials, and the purpose for these materials. A box was placed at the library exit for users to leave the forms.

The survey was carried out by the authors and six other reference librarians who volunteered to participate. The volunteers reviewed draft survey instruments and provided valuable feedback in the development process. The instruments were then tested in January 1993 on several student assistants in the Reference Department.

Each librarian was asked to choose four hours in which to participate in the nineteen-day survey period in March 1993. Librarians were given twelve packets, each containing an observation form, a patron questionnaire, and a document availability form; they were asked to complete at least ten observation forms, for a total of eighty responses. A minimum of eighty observations permitted the library to survey a considerable number of searches, yet was manageable within existing workloads. While greater sample sizes ensure that estimates are more precise and reliable, larger sample sizes require more expenditures for collecting data, especially when interviews are being carried out. A total of ninety-three completed forms was returned by the librarian-observers. Seventy-seven patron questionnaires and forty-three document availability patron forms were returned. The online catalog terminals located adjacent to the reference desk on the first floor of Clark Library were used for the survey. A random process was developed to guide the librarian in selecting a patron to approach. Each librarian was given a set of small cards, each representing one of the eight clusters of three terminals. The librarian, prior to each observation period, shook up and drew the cards to establish a random approach to the terminals. Written sampling procedures and a group meeting to discuss the process prepared the observers.

The librarian observer, using a recommended script complied with the university's Human Subjects in Research requirements, explained the project and procedure and asked for the individual's cooperation. The librarian stood directly behind the patron using the catalog and recorded information on the observation form. When the patrons had concluded the search, they were asked to complete the one-page questionnaires and return them to the observers. The observers were requested not to offer suggestions or advice to the user; however, they briefly could answer questions asked by the user. Data were analyzed using SPSS frequencies and cross tabulations.

To relate the results of the small observation study with overall online catalog usage, an analysis of the online catalog transaction logs was carried out. A random sample of three hours of the thirty hours of the online study (a 10 percent sample) was used; this was 1,560 searches. This random sample was used to check whether the searches observed were representative of the general type of searching done during this time period. These logs, arranged by index used (that is, author, title, keyword, subject heading, and call number), listed the terms entered by the patrons. A student assistant with extensive library experience searched each term exactly as entered by the patrons and recorded the number of hits found. For each index, a statistical summary was prepared to show how many searches had no hits, how many had one hit, two hits, etc.
Document Availability Study

Concurrent with the Online Study, a Document Availability Study investigated the users' success in locating materials identified through the online catalog search. A sheet was provided to each subject in the Online Study as described above.

An experienced student assistant was hired to determine the location of each item patrons reported as not found. He checked stacks, sorting areas, circulation records, etc., to ascertain if possible the reason for failure in locating the items. This follow-up took place as soon as possible after the patron search, to assure a minimum of material relocation.

RESULTS AND DISCUSSION

Survey Population

This information is presented so that the reader may obtain an understanding of the nature of the student body. The demographic information was collected because the authors wanted to ensure that the different class levels and ethnic groups were included in the survey. The comparisons provide evidence that both survey samples are fairly representative of students enrolled in the university by class level and ethnicity.

Tables 1 and 2 record demographic information for students participating in both the Reference Transaction Analysis Instrument and the Online Catalog Study, relating it to the campus population of San Jose State University. Of the 125 persons asking reference questions in the RTAI study, 116 (94 percent) were students. Of the 77 persons completing questionnaires in the Online Catalog Study, 71 (92 percent) were students.

The Reference Transaction Assessment Survey

Because we wished to compare the results of the RTAI with the Online Catalog Observation Study conducted by reference staff at catalog terminals in the reference area, we have chosen to use only those results for the Reference Department, rather than include the results for the Government Publications Department. Among the questions on the library staff form, one asked for an identification of types of sources used, recommended, or interpreted. The standard RTAI analysis does not include the analysis of all causes of failures for specific book questions because these questions are generally quite straightforward. Including these questions would have greatly increased the cost of the analysis. Of the 125 completed forms, 22 involved questions concerning locating a specific book. They were not included in the RTAI analysis, which contained comparisons with other libraries. Of the remaining 103 transaction forms, 87 had the type of source marked. Of the 87, 30 (34 percent) indicated that the online catalog was used. Of these 30 cases where the online catalog was used, only eleven, or slightly over one-third, found exactly what was wanted. In the comparison group, libraries of similar size, just over half of patrons found exactly what was wanted when the catalog was used. Table 3 shows the percentage of patrons who found exactly what was wanted when specific types of sources were used for both San Jose State University (SJSU) and the comparison group of large academic libraries.

The demographic information was collected because the authors wanted to ensure that the different class levels and ethnic groups were included in the survey.

The low rate of reference transaction success when the online catalog was a source may result from several different situations. The accepted philosophy of the Reference Department is to teach the patron how to use the tool, rather than to find the answer for the patron. As table 3 shows, within the three types of sources where a teaching approach is more likely to be used, periodical indexes, online catalog, and CD-ROM, the success rate is below 50 percent. The librarian will generally get the patron started in the use of these three types of
**TABLE 1**
CLASS LEVEL OF STUDENT PARTICIPANTS, STUDENT BODY

<table>
<thead>
<tr>
<th>Status</th>
<th>RTAI</th>
<th>Online Catalog Study</th>
<th>SJSU Student Body</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
<td>Number</td>
</tr>
<tr>
<td>Freshman</td>
<td>7</td>
<td>6.0</td>
<td>6</td>
</tr>
<tr>
<td>Sophomore</td>
<td>10</td>
<td>8.6</td>
<td>4</td>
</tr>
<tr>
<td>Junior</td>
<td>26</td>
<td>22.4</td>
<td>19</td>
</tr>
<tr>
<td>Senior</td>
<td>52</td>
<td>44.8</td>
<td>29</td>
</tr>
<tr>
<td>Graduate Student</td>
<td>21</td>
<td>18.1</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>116</td>
<td>99.9</td>
<td>71</td>
</tr>
</tbody>
</table>

Note: Other participants included faculty/staff (RTAI 1, Online catalog 3), continuing education (Online catalog 1), and not affiliated with the University (RTAI 6, Online catalog 2).

Total of RTAI respondents is 125 (116 + 7 other + 2 with status unknown).

**TABLE 2**
ETHNIC BACKGROUND

<table>
<thead>
<tr>
<th>Background</th>
<th>Online Catalog Success Study</th>
<th>SJSU Student Body</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
</tr>
<tr>
<td>African American/Black</td>
<td>5</td>
<td>6.5</td>
</tr>
<tr>
<td>American Indian/Alaskan</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Asian</td>
<td>11</td>
<td>14.3</td>
</tr>
<tr>
<td>Chicano/Hispanic</td>
<td>12</td>
<td>15.6</td>
</tr>
<tr>
<td>Filipino</td>
<td>3</td>
<td>3.9</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>White</td>
<td>40</td>
<td>51.9</td>
</tr>
<tr>
<td>Unknown</td>
<td>5</td>
<td>6.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>77</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note: Ethnic backgrounds for the Online Catalog Success Study and for the SJSU student body are self-reported. The ethnic background of participants is not available for the RTAI study.

**TABLE 3**
SUCCESS RATES FOR TYPES OF SOURCES

<table>
<thead>
<tr>
<th>Type of Source Used</th>
<th>Total</th>
<th>Patrons Report Found Exactly and Completely Satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Number</td>
</tr>
<tr>
<td></td>
<td>SJSU</td>
<td>SJSU</td>
</tr>
<tr>
<td>Reference books</td>
<td>33</td>
<td>20</td>
</tr>
<tr>
<td>Own knowledge</td>
<td>17</td>
<td>9</td>
</tr>
<tr>
<td>Consult with another staff member</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Indexes to periodicals</td>
<td>29</td>
<td>11</td>
</tr>
<tr>
<td>Online catalog</td>
<td>30</td>
<td>11</td>
</tr>
<tr>
<td>Computer database, CD-ROM</td>
<td>25</td>
<td>9</td>
</tr>
<tr>
<td>Refer patron to another department</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: Success levels based on 103 reference transactions.

Comparison group is large academic libraries and is supplied as part of the RTAI analysis.
TABLE 4
PATRON REPORTS OF TIME, HELP, AND EXPLANATION

<table>
<thead>
<tr>
<th>Patrons report did not receive enough time</th>
<th>% SJSU</th>
<th>% Comparison Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patrons report not enough help and explanation</td>
<td>9.7</td>
<td>6.0</td>
</tr>
<tr>
<td>Librarians report patrons need extra help</td>
<td>12.6</td>
<td>8.5</td>
</tr>
<tr>
<td>Librarians report patrons return frequently</td>
<td>3.9</td>
<td>8.7</td>
</tr>
</tbody>
</table>

TABLE 5
SUCCESS LEVELS BY TYPES OF SOURCES AND BUSY CONDITIONS

<table>
<thead>
<tr>
<th>Sources</th>
<th>SJUS</th>
<th>Comparison Large Acad.</th>
<th>All Academic Libraries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Busy</td>
<td>% Not Busy</td>
<td>% Busy</td>
</tr>
<tr>
<td></td>
<td>(N=58)</td>
<td>(N=45)</td>
<td>(N=659)</td>
</tr>
<tr>
<td>Reference books</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete success</td>
<td>50.0</td>
<td>76.9</td>
<td>48.8</td>
</tr>
<tr>
<td>Adding mostly</td>
<td>60.0</td>
<td>84.6</td>
<td>58.7</td>
</tr>
<tr>
<td>Indexes to periodicals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete success</td>
<td>35.0</td>
<td>44.4</td>
<td>43.0</td>
</tr>
<tr>
<td>Adding mostly</td>
<td>45.0</td>
<td>55.6</td>
<td>55.8</td>
</tr>
<tr>
<td>Online catalog</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete success</td>
<td>28.6</td>
<td>55.6</td>
<td>47.4</td>
</tr>
<tr>
<td>Adding mostly</td>
<td>33.3</td>
<td>66.7</td>
<td>62.3</td>
</tr>
<tr>
<td>Computer database, CD-ROM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete success</td>
<td>31.6</td>
<td>50.0</td>
<td>48.6</td>
</tr>
<tr>
<td>Adding mostly</td>
<td>36.8</td>
<td>83.3</td>
<td>56.1</td>
</tr>
</tbody>
</table>

Note: "Complete success" means that patrons reported finding exactly what was wanted and being completely satisfied. "Adding mostly" means that patrons reported finding exactly what was wanted or finding what they wanted within limits and being completely satisfied.

sources and provide further assistance if it is needed. In the case of the online catalog, the librarian will usually show the patron the rudiments of its use and recommend an index to use (author, subject, etc.) and an appropriate term with which to begin the search. The patron is then referred to online catalog terminals located at the far end of the room.

It appears that this teaching approach, although frequently necessary because of the volume of business (the librarian reports "busy" or "very busy" in 56 percent of cases, in comparison to 29 percent of cases at libraries of similar size), may not assure patrons the high level of library success desired. Another problem may be the librarian's assumption that the patron understands the instructions well enough to carry on independently. The survey results tend to support these theories. In comparison with other large academic libraries, a higher proportion of SJSU patrons reported that they had not received enough time, help, and explanation (table 4). Also at SJSU, librarians reported that patrons needed extra help and returned less often than in the comparison group of libraries.

In comparison with other libraries, SJSU patron success rates for questions involving use of the different types of answering sources were influenced dramatically by the volume of demand for reference services. This is particularly true for the online catalog. When librarians report that they are not busy, success
TABLE 6
SUCCESS, TIME, AND HELP LEVELS FOR TYPES OF SOURCES AT SJSU

<table>
<thead>
<tr>
<th>% Reference Books (N=38)</th>
<th>% Periodical Indexes, Printed (N=30)</th>
<th>% CD-ROMs (N=25)</th>
<th>% Online Catalog (N=38)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Success level</td>
<td>68.4</td>
<td>46.7</td>
<td>40.0</td>
</tr>
<tr>
<td>Patron reports enough help</td>
<td>94.7</td>
<td>86.7</td>
<td>76.0</td>
</tr>
<tr>
<td>Patron reports enough time</td>
<td>94.7</td>
<td>93.3</td>
<td>84.0</td>
</tr>
<tr>
<td>Librarian reports helped</td>
<td>77.8</td>
<td>63.3</td>
<td>36.0</td>
</tr>
<tr>
<td>Patron reports librarian helped</td>
<td>91.9</td>
<td>66.7</td>
<td>52.2</td>
</tr>
</tbody>
</table>

Note: Success levels (patrons reported finding exactly what was wanted and being completely satisfied) in this table are based on 125 reference transactions, including 22 specific book questions.

TABLE 7
ONE-SOURCE TRANSACTIONS AND SUCCESS BY TYPE OF SOURCE

<table>
<thead>
<tr>
<th></th>
<th>Online Catalog (N=35)</th>
<th>Reference Books (N=34)</th>
<th>Periodical Indexes (N=27)</th>
<th>CD-ROMS (N=19)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No./% involving 1 source</td>
<td>14 (40.0%)</td>
<td>13 (38.2%)</td>
<td>9 (33.3%)</td>
<td>10 (52.6%)</td>
</tr>
<tr>
<td>Percent successful</td>
<td>21.4%</td>
<td>76.9%</td>
<td>66.7%</td>
<td>60.0%</td>
</tr>
</tbody>
</table>

rates for questions involving the online catalog are consistent with success levels in comparison groups of libraries (table 5). Other libraries achieve comparable success rates for questions involving the use of the online catalog independent of the level of demand. However, the patron success rate is much lower at San Jose under conditions of high demand for reference service. Questions involving the use of CD-ROMs at San Jose and other large academic libraries tend to follow this pattern. In contrast, for questions involving reference books, success levels under busy conditions are comparable to other comparison groups under high demand, and much higher under conditions of low demand. For questions involving use of periodical indexes, success rates for large academic libraries, including San Jose, are lower under high levels of demand.

The library obtained the lowest success rate in relation to the comparison group (51 percent versus 65 percent) on questions librarians judged to be "easy" and higher success scores than comparable institutions (33 percent versus 27 percent) on questions librarians rated as "hard." The low success rate for "easy" questions relative to other large academic libraries also suggests that librarians tended to overestimate the ability of patrons to locate information on their own. Librarians appeared to be particularly likely to underestimate the assistance and time patrons needed to utilize automated resources. For printed materials, reference books, and periodical indexes, not only were patron success levels higher, but a much greater percentage of patrons reported that they received sufficient time and assistance for questions involving the use of these sources than they reported for questions involving use of the online catalog and/or CD-ROMs (table 6) Another finding suggests that the instructional philosophy may be related to the low success rate: the particularly low rate of success when the online catalog is the only source (table 7).

When the online catalog was used alone, in comparison to other types of sources, only a very small percent were judged to provide the patron with success.

The following comparisons all suggest that reliance on instruction rather than direct assistance, especially for easy questions, is related to the low success rate reported by users for reference
queries concerning the online catalog. In responding to queries, librarians were slightly more likely to consult only one source than those in comparison libraries (nearly 47 percent versus 42 percent); more likely to spend zero to two minutes per question (48 percent versus 37 percent); and less likely to spend over five minutes on questions (about 12 percent versus 21 percent). Librarians were also less likely to report that patrons had actually found the information than librarians from the comparison group of institutions (54 percent versus nearly 65 percent), and more likely to report that they didn't know (33 percent versus 13.5 percent) on the same question. Agreement between librarian and patron on whether the information was found was also lower than in the comparison group (about 55 percent versus nearly 71 percent).

Librarians appeared to be particularly likely to underestimate the assistance and time patrons needed to utilize automated resources.

The nature of the student body at San Jose State University may play a role in these results. Because it is located in an area of great cultural diversity, San Jose State affirms its mission to be the education of students from this varied population. Campus demographic figures reflect the large number of nontraditional students attending the university. Fewer than half of all students are white, while three-quarters of first-time freshmen are comprised of a rich variety of nonwhite minority groups (table 2). Many of these are the first generation in their families to attend college. A large number are immigrants whose first language is not English. Compounding the educational challenges caused by the nature of the student body, the public schools in California have experienced severe funding problems; very few public schools have librarians, including those that have libraries. Few students entering the university have basic library or research skills or much experience in using a large library.

Patrons were asked if the level of material was appropriate. It is interesting to note that about 7 percent wanted simpler material, while only about 6 percent wanted more comprehensive information. This is in contrast to the comparison group where a smaller proportion (about 4 percent) wanted simpler data and a greater proportion (nearly 9 percent) wanted more thorough material.

**The Online Catalog Study**

As a complement to the Reference Transaction Survey, the purpose of the Online Catalog Study was to learn more about successes and failures of people using the online catalog without staff assistance. On the observation form, each librarian recorded the type(s) of access selected and the apparent ease with which people used the feature. The sample of searches conducted by the ninety-three people during the study appears to be quite similar to the overall search pattern, as recorded in the online catalog transaction logs for the same time period. In the sample study, titles were searched by the people being observed somewhat less often than would be expected, based on the records of all public searching during these three weeks (table 8).

In table 9, the type of access is listed in order of frequency of use, with subject the most frequent access type and OCLC number the least frequent.

<table>
<thead>
<tr>
<th>Catalog Option</th>
<th>% (Sample Study, N = 149)</th>
<th>% (Transaction Log Study, N = 93,156)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject</td>
<td>37.6</td>
<td>32.7</td>
</tr>
<tr>
<td>Title</td>
<td>21.5</td>
<td>31.3</td>
</tr>
<tr>
<td>Keyword</td>
<td>18.8</td>
<td>15.6</td>
</tr>
<tr>
<td>Author</td>
<td>16.1</td>
<td>16.1</td>
</tr>
<tr>
<td>Call number</td>
<td>3.4</td>
<td>3.1</td>
</tr>
<tr>
<td>Standard number</td>
<td>2.1</td>
<td>0.8</td>
</tr>
<tr>
<td>OCLC number</td>
<td>0.7</td>
<td>0.4</td>
</tr>
<tr>
<td>Total</td>
<td>100.1</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Subject, title, keyword, and author were by far the most frequently used features. Of these four, a greater percent of patrons had some or considerable difficulty with subject heading searching, followed by author searching. Of those observed having considerable difficulty, while the largest number (seven) were in the category of subject headings, as a percentage of the total searches in a category, about 21 percent (five of twenty-four) of those attempting author searches were observed experiencing considerable difficulty. Fourteen percent (seven of fifty) of those attempting subject heading searches were observed experiencing considerable difficulty. Although ethnicity was not significantly associated with user reports of online catalog searching success, a greater proportion of whites (35 percent) used keyword searching than people from other backgrounds (about 19 percent). This difference was significant ($X^2 = 9.63, df = 3, p = .022$).

A study of three hours of transaction logs from March 1993 provides further evidence of the difficulties users experience in searching by subject heading. As illustrated in table 10, subject heading searches were much more likely to result in no retrievals of titles than keyword searches (49 percent of all subject heading searches versus about 17 percent of all keyword searches).
TABLE 11
ONLINE CATALOG LIMIT AND EXPAND FEATURES USED

<table>
<thead>
<tr>
<th>Feature</th>
<th>Sample Study (N = 93)</th>
<th>Sample Study % (N = 93)</th>
<th>Transaction Log % (N = 93,156 searches)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Limit features</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limit to words in subject</td>
<td>5</td>
<td>5.4</td>
<td>—</td>
</tr>
<tr>
<td>Limit to publisher</td>
<td>2</td>
<td>2.2</td>
<td>—</td>
</tr>
<tr>
<td>Limit—any</td>
<td>—</td>
<td>—</td>
<td>2.4</td>
</tr>
<tr>
<td><strong>Expand features</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Show items nearby on shelf</td>
<td>6</td>
<td>6.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Show items with same subject</td>
<td>4</td>
<td>4.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Same search as word search</td>
<td>3</td>
<td>3.2</td>
<td>1.3</td>
</tr>
</tbody>
</table>

TABLE 12
LOCATING MATERIALS IN THE ONLINE CATALOG

<table>
<thead>
<tr>
<th>Locating Materials</th>
<th>RfAI # of Users</th>
<th>RfAI %</th>
<th>Online Catalog Study # of Users</th>
<th>Online Catalog Study %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, just what wanted</td>
<td>18</td>
<td>47.4</td>
<td>34</td>
<td>45.9</td>
</tr>
<tr>
<td>Yes, with limitations</td>
<td>8</td>
<td>21.1</td>
<td>18</td>
<td>24.3</td>
</tr>
<tr>
<td>Yes, not looked for but help-ful</td>
<td>3</td>
<td>7.9</td>
<td>5</td>
<td>6.8</td>
</tr>
<tr>
<td>Yes, but not really what wanted</td>
<td>1</td>
<td>2.6</td>
<td>2</td>
<td>2.7</td>
</tr>
<tr>
<td>Only partly</td>
<td>3</td>
<td>7.9</td>
<td>7</td>
<td>9.5</td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>13.2</td>
<td>8</td>
<td>10.8</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>100.1</td>
<td>74</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Librarians also observed other options that patrons used. At the bottom of the online catalog screen, users may select, among other choices, options that will either narrow (limit) or expand their search.

Slightly fewer than half of the participants found exactly what they wished to find.

Only seven of the ninety-three persons made use of the powerful "limit" feature to narrow or refine their search (table 11). Analysis of the transaction logs for three weeks in March also revealed that the limit and expand features were very rarely used in searches. None of the patrons observed used "Limit to Words in Title," which is particularly useful in locating a relatively new term or phrase or one in common usage in a particular field but which is not reflected in the Library of Congress Subject Headings. Limit by words in author, year of publication, material type, and language was not observed being used by any users in this sample. A feature frequently used by SJSU librarians to locate periodical records among multiple hits, such as *Life*, is the Limit by Where Item Is Located, permitting limiting to periodical records. This feature was not used by the study group. Analysis of transaction logs from three hours in March revealed that of 1,560 total searches, 19 percent resulted in over forty hits (table 10); few people wish to browse that many titles. These results suggest that the limit feature has
the potential to assist in many additional searches. Of the eight people who reported that they found nothing in the online catalog, none had used the limit or show features.

The number of search features used and the order in which they were used were observed by the librarians. A majority of users (63 percent) used only one search strategy. When a single search strategy was used, subject headings were much more likely to be selected (48 percent), with title a distant second choice strategy (22 percent). A minority of users (about 38 percent) employed multiple search features. Users did not appear to prefer one search strategy over others as a most frequent starting point. Half of the people employing multiple strategies used only two search strategies. Librarians observed the length of time users spent on their search and found catalog search times to be relatively brief. About half of the users spent five minutes or fewer. The mean or average time is eight minutes; the most common time is five minutes (eighteen users); the median is six minutes.

Another question we sought to answer was whether people found what they wanted, too little or too much, and how they dealt with finding too little or too much. Information on user reports concerning whether they located just what they wanted is helpful in answering this question. Slightly fewer than half of the participants found exactly what they wished to find. Roughly the same proportion of users found some material they could use, and a small minority found nothing at all (table 12). In comparing patron reports of finding materials in the online catalog with reference assistance (RTAI) and without reference assistance (Online Catalog Study), percentages of patrons finding just what was wanted and with limitations are remarkably similar.

Patron satisfaction with the result of the search is also helpful in measuring success, although satisfaction may be a more general measure involving the patrons' general expectations of the library. Only about one-third were fully satisfied with their online search result, fewer than those who reported that they found just what they wanted. Very few were dissatisfied; no patrons reported that they were completely dissatisfied (table 13). In the case of satisfaction, a much greater proportion of patrons reported that they were completely satisfied when they used the catalog with reference assistance (RTAI) than when they used the catalog unassisted (Online Catalog Study). However, this could be because the five-point scale used in the Online Catalog Study permits users to select an almost completely satisfied choice, whereas the three-point scale for the RTAI does not.

A concept important in the understanding of online catalog satisfaction is the relationship between a user's expressed satisfaction and other variables relating to catalog use. Patrons who spent a longer time searching in the online catalog tended to be more satisfied with the online catalog \( r = .23, p = .02 \). However, longer searches were not related to
whether patrons found the materials they wanted in the online catalog. The association between satisfaction with the online catalog search and success in finding items in the catalog is a moderately strong relationship ($r = .37, p = .001$); however, much of the satisfaction rating cannot be explained by finding items in the catalog. Locating materials in the online catalog and length of the online catalog search accounted for 17 percent of the variance in the user satisfaction rating ($R^2 = .17, df = 2/71, F = 8.56, p = .0005$). A more rigorous measure of total user success in the online catalog can be developed by combining the categories of finding materials wanted in the online catalog with user satisfaction and counting only those who found exactly what they wanted and were completely satisfied and viewed the search as completely successful. Of the seventy-four questionnaires for which this comparison could be done, fifty-eight (78 percent) experienced reasonable levels of success in that they reported satisfaction and also indicated that they located at least something they could use. Total success, using this method, was 24 percent. In comparison with the findings of the RTAI, total success for the online catalog when reference assistance was provided was about 37 percent (exact figure is 36.7 percent; see table 3).

The high proportion of failures due to user stack skills, ranging from one-third to over one-half of all failures over the years, is another indication of the need for more extensive assistance for students at SJSU.

Perceived ease of use of the online catalog appears to be important for users' general satisfaction with the library and its service. People rating ease of use of the catalog more highly also tended to be more satisfied ($r = .27, p = .008$). Slightly over one-quarter of the participants in the study found the catalog extremely easy to use, with 58 percent finding it easy. No one found it difficult or extremely difficult to use. When asked for suggestions for improving the online catalog, a patron commented, "I like it very much. It's easy to use. Much easier than [another California university] system." Another patron commented: "This was the first time I've used the system. I'm quite impressed with it. My only complaint is that it is not quite as self-explanatory as I'd like for a first timer. I had to ask for assistance from a librarian a couple of times—no big deal though."

When patrons report their success in locating materials, satisfaction with the search, and ease of online catalog use, patrons are reflecting on the results of their experience in related but slightly different ways. In table 14, the findings from these three questions on the patron questionnaire have been incorporated into one chart. For each of the questions, the results have been consolidated into three ranges—positive, neutral, and negative (table 14). Although the positive "Finding Materials" percentage was somewhat lower than that of the "Satisfaction" and "Ease" percentages, the overall results of patron experience with the online catalog were very positive.

Another broad question concerned those users looking for specific titles and/or authors in contrast to those looking for anything/everything on a subject. Does the type of material wanted by the user affect the individual's success? The results in table 15 do seem to indicate a significant relationship between the material desired and success. Those seeking some materials on a topic were a little more likely to be successful than others. Those seeking everything on a topic were more likely to indicate that they had not had any success.

Another concern of the authors of this study was whether people actually found the items in the library after locating titles in the online catalog. A key to finding materials in the bookstacks appears to be related to the user's viewing of the complete record in the catalog. When using the online catalog, the user has the option to stop the search at the summary screen, which provides a short
TABLE 14
USER EXPERIENCE WITH ONLINE SEARCH

<table>
<thead>
<tr>
<th>Category</th>
<th>Positive %</th>
<th>Neutral %</th>
<th>Negative %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finding materials</td>
<td>70.2</td>
<td>18.9</td>
<td>10.8</td>
<td>99.9</td>
</tr>
<tr>
<td>Online catalog search satisfaction</td>
<td>84.4</td>
<td>13.0</td>
<td>2.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Ease of online catalog use</td>
<td>84.4</td>
<td>15.6</td>
<td>0.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

TABLE 15
LOCATING MATERIALS BY SPECIFIC VERSUS GENERAL MATERIAL

<table>
<thead>
<tr>
<th>Locating Materials</th>
<th>% Particular Author/Text (N = 30)</th>
<th>% Some Material on Topic (N = 36)</th>
<th>% Everything on Topic (N = 9)</th>
<th>% Particular Item + Some Material (N = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, exactly</td>
<td>40.0</td>
<td>50.0</td>
<td>42.9</td>
<td>100.0</td>
</tr>
<tr>
<td>Yes, with limits</td>
<td>30.0</td>
<td>22.2</td>
<td>14.3</td>
<td>0.0</td>
</tr>
<tr>
<td>Yes, not looked for but helpful</td>
<td>3.3</td>
<td>11.1</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Yes, but not what really wanted</td>
<td>3.2</td>
<td>2.8</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Only partly</td>
<td>13.3</td>
<td>5.6</td>
<td>14.3</td>
<td>0.0</td>
</tr>
<tr>
<td>No</td>
<td>10.0</td>
<td>8.3</td>
<td>28.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>99.9</td>
<td>100.0</td>
<td>100.1</td>
<td>100.0</td>
</tr>
</tbody>
</table>

(Missing cases = 19; $\chi^2 = 36.49, df = 5, p < .0001.)

Thus received the detailed screen as the first display.

By comparing the observer librarian's record with the "Did You Find It?" document availability questionnaire, discussed further in the next section, it was possible to create a finding ratio for users who proceeded to the detailed information screen and those who stopped at the summary screen (table 16). There is a significant and strong association (Cramer's V=.82) between the proportion of desired material found in the stacks and users who view the holdings detailed-level screen in the online catalog.

Users looked for a total of ninety-three items in the stacks; sixty-one (about 66 percent) were found by users. Table 17 analyzes the reasons for failures and provides comparisons with earlier document availability studies done at SJSU. In this small sample of failures, items in circulation was the most frequent reason users were unable to obtain materials immediately. Circulation has often been the leading cause of failed retrieval in
Table 16
SUMMARY SCREEN AND FINDING RATIO

<table>
<thead>
<tr>
<th>Finding Ratio % Found</th>
<th>% Proceed to Detailed Screen (N = 20)</th>
<th>% Stop at Summary Screen (N = 9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.00</td>
<td>55.0</td>
<td>0.0</td>
</tr>
<tr>
<td>83.33</td>
<td>0.0</td>
<td>11.1</td>
</tr>
<tr>
<td>75.00</td>
<td>10.0</td>
<td>0.0</td>
</tr>
<tr>
<td>66.67</td>
<td>15.0</td>
<td>22.2</td>
</tr>
<tr>
<td>60.00</td>
<td>5.0</td>
<td>0.0</td>
</tr>
<tr>
<td>50.00</td>
<td>5.0</td>
<td>0.0</td>
</tr>
<tr>
<td>40.00</td>
<td>5.0</td>
<td>0.0</td>
</tr>
<tr>
<td>33.33</td>
<td>0.0</td>
<td>11.1</td>
</tr>
<tr>
<td>00.00</td>
<td>5.0</td>
<td>55.6</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

(Missing Cases = 2; $X^2 = 19.50, df = 8, p = .0124.)

Past studies also (table 17). Missing items and poor user stack skills also contributed significantly to failures. A number of users also were unaware of the need to look carefully at the location information and missed books shelved in the less heavily used building, Wahlquist Library stacks. The high proportion of failures due to user stack skills, ranging from one-third to over one-half of all failures over the years, is another indication of the need for more extensive assistance for students at SJSU.

Conclusion

The online catalog success study results at San Jose add to already existing knowledge concerning unassisted patron use of online catalogs. Subject heading searching is the type most likely to fail, as noted by librarian observers and confirmed by analysis of transaction logs. Results for subject heading searching at San Jose, compared to other studies cited previously in the literature review, are favorable. While Ray R. Larson found that only 12 percent of subject searches yielded between one and twenty items, at San Jose over 25 percent did (table 10). Nonetheless, at San Jose, subject headings remain the most frequently used feature and the element with which patrons experience the most difficulty.

Table 17
BOOK AVAILABILITY STUDIES* AT SAN JOSE STATE UNIVERSITY: 1976–1993

<table>
<thead>
<tr>
<th>Reasons for failures</th>
<th>% April 1976 (N = 1,365)</th>
<th>% April 1979 (N = 2,033)</th>
<th>% April 1983 (N = 350)</th>
<th>% April 1988 (N = 499)</th>
<th>% April 1993 (N = 93)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items found</td>
<td>76.0</td>
<td>40.7</td>
<td>68.3</td>
<td>54.1</td>
<td>65.6</td>
</tr>
<tr>
<td>Items not found</td>
<td>24.0</td>
<td>59.3</td>
<td>31.7</td>
<td>45.9</td>
<td>34.4</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

* All of these studies were based on a methodology originally developed by Paul Kantor. For details see Paul B. Kantor, “Availability Analysis,” Journal of the American Society for Information Science 27 (1976): 316–18.

** Books not owned by the San Jose University Library.

*** User stack skills are a measure of whether the user can find an item which is on the shelf in the proper location. By 1983, the collections had been split into two buildings; and in that study about two-thirds of the user stack failures were because users did not realize items were shelved in the older library building or other special locations. Even in 1993, over 40 percent of the failures were due to items being shelved in special locations.

**** Includes badly misshelved items and missing items.
Patron online catalog searches can be characterized as quite brief, employing relatively few strategies, and rarely using advanced searching options for limiting and expanding the search. Peters and Kurth's study cited in the literature review also indicates that many users do not employ multiple strategies in subject searching.

In judging user success, satisfaction alone appears to be a very limited measure of success with users reporting more positively on satisfaction with the search and ease of use than they do for finding materials (table 14). It appears that while one-fifth of patrons have negative experiences with finding materials in the online catalog, few respond negatively concerning satisfaction or ease of use. Therefore, user satisfaction is indeed a complex measure and not strongly associated with finding materials in the online catalog. Finally, patrons' failure to access the detailed online catalog screens with circulation status and holdings information is strongly associated with user failure in locating actual documents.

One of the most interesting results of this study is that patrons reported similar levels of success in finding just what was wanted in the online catalog whether they asked a librarian or used the online catalog as unassisted users (table 12). This suggests that at San Jose, asking a librarian does not seem to enable patrons (who are perhaps less well prepared to search on their own) to be more successful in finding materials than catalog users who do not ask for reference assistance.

Concerning reference assistance with the online catalog, an analysis of RTAI transactions involving the use of the online catalog indicates that these transactions resemble the syndrome of characteristics identified by Bunge and Murfin as typical of less successful reference service in libraries. At San Jose, when librarians answer questions involving online catalog use, they are more likely to direct the user how to search, rather than actually doing the search with the user. Questions involving online catalog use at San Jose are also characterized by more transactions of two minutes or fewer, one-source transactions, more users not receiving enough time and help, and low agreement on patron success by librarians and users.

It would appear, in our multicultural, multilingual university with severe budget problems affecting our collections and personnel resources, that patron and librarian expectations of the library and the role of the librarian are frequently dissimilar. This occurs despite an active outreach program, with curriculum-based bibliographic instruction, outreach programs directed toward minority groups, and special programs for international students. As previously mentioned, California's budget problems have translated into public school funding problems. We are seeing the impact of inadequate libraries and library instruction in the elementary and secondary schools. We believe this study has implications that touch on reference practice, as well as the design of the online catalog.

Implications for Reference Practice

Changes in reference practice and philosophy should be considered in order to more adequately meet the needs of our academic community. If we consider "teaching" and "providing the information" as opposite ends of a spectrum, movement along that spectrum toward the "information providing" end may be an important emphasis. Developing a series of strategies that can provide appropriate reference behaviors for persons working at service points may be one of the most important actions. This could also be true at service desks, where reference and/or instruction are not the primary purposes. Staff at circulation, periodical service, and other similar desks, in libraries where directions and brief instruction are the norm, also may not be meeting the needs of student patrons who require more assistance.

Through their assignments and classroom presentations, teaching faculty play an important role in students' use of the library. Classroom teachers and librarians working together need to provide more
instruction and assistance in search strategies, particularly techniques for narrowing and expanding searches, and the appropriate use of keyword versus controlled vocabulary. The scope of the online catalog should be clarified. Informal examinations of the librarian observers indicated that many users do not understand the role of the catalog in locating information versus that of other bibliographic sources, such as periodical and newspaper indexes. Our findings need to be conveyed to faculty, and we need to create a plan for cooperatively working toward solutions.

Classroom teachers and librarians working together need to provide more instruction and assistance in search strategies, particularly techniques for narrowing and expanding searches, and the appropriate use of keyword versus controlled vocabulary.

These proposed changes would seem to require that additional time and effort be spent with patrons, according to their needs. To effect these changes, there must be a strong degree of consensus at all levels of staffing and library structure. Increased staffing levels, further staff training in appropriate service behaviors, and expanded student instruction, either in the classroom or in library-initiated and faculty-supported workshops may be necessary elements in a plan. Without adequate resource and staff support, reference librarians and others may need to make choices between quality and quantity. In scarce resource environments, painful choices must be made; either librarians help people more extensively and provide service to fewer people, or librarians help more people but not to the extent that they need. However, even when resources are not adequate, studies such as this project will help ensure that staff clearly understand the consequences of the choice in terms of success for their particular type of users.

Online Catalog Interface Implications

Change in the present online catalog interface is an important element in improving user success. Changes in the introductory online catalog screen should be considered. Users might be better served by a less cluttered screen, listing only the four major access points (Author, Title, Keyword, and Subject Headings), plus Other (less heavily used features then listed on a second screen when this choice is selected) and Connect to Other Databases. Users attempting to locate information on subjects would be better served by selecting keyword rather than subject heading as their first access strategy. Keyword is listed above Subject Heading on the screen but is less frequently searched according to transaction logs. A proposal is now being considered which will more strongly encourage novice users to begin with keyword—keyword would still be listed above subject heading, but would be labeled "Subject or Title Words." This should make keyword a more appealing choice to users, particularly nonnative speakers of English. The choice now labeled "Subject Heading" would be changed to "Library of Congress Subject Heading." This should provide a clearer message to users that these headings are somewhat more esoteric and less desirable as a first choice. Finally, the authors believe that online catalog software that converts zero hit searches to other forms of subject queries should be an important priority for vendors.

The content of summary screen displays should be reviewed to determine if changes should be made to encourage a greater proportion of users to view the detailed screen with the most accurate item location information. Because the screen summaries are a fairly standard format of Innovative Interfaces catalogs, vendor software changes may also be needed.

Implications for Study Methodology

The methodology developed for this study provided a unique and highly useful multiperspective view of the role of
the online catalog in library service. This methodology was very cost-effective. Although it required the cooperation and assistance of the entire Reference Department staff, the time each individual contributed was relatively small. The group of eight librarians who carried out the online catalog study contributed an estimated five hours each, including planning meetings and online catalog user interviews. The library provided the necessary funds (less than five hundred dollars) for the RTAI study, including the basic analysis. A small grant from the California Library Association’s California State University Librarians Group paid for student assistant help for the online catalog study. The SJSU Information Systems and Computing provided the resources for analysis using SPSS.

We encourage other libraries to replicate the study, and the instruments have been submitted to the ERIC Document Reproduction Service (EDRS). As remote access to bibliographic systems, such as online catalogs and full-text electronic databases, becomes increasingly common, one of the most important issues our profession must address is the role and nature of reference assistance for patrons conducting searches from remote sites. Studies comparing success of assisted and unassisted users will enhance our knowledge and enable the profession to utilize scarce resources more effectively.

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Humanists Revisited: 
A Longitudinal Look at the Adoption of Information Technology
Stephen E. Wiberley Jr. and William G. Jones

Developments in information technology have had a major impact on the conduct of research and scholarship. In general, humanists have been slower than scientists and social scientists to adopt new technologies in their work. This paper, a longitudinal study of eleven humanists, corroborates the general pattern and provides insight into why humanists use technology as they do. It relates its findings to a definition of the humanities: those fields of scholarship that strive to reconstruct, describe, and interpret the activities and accomplishments of men and women by establishing and studying documents and artifacts created by those men and women. The discussion emphasizes that the primary evidence that humanists use differentiates them from scientists and social scientists.

It has become a platitude that information technology is transforming the way scholars work. Discussions of this transformation usually stress both the speed and the scope of change. Certainly in less than a decade almost all scholars have adopted the basic technology of word processing. And scientists and social scientists use technology to store, send, retrieve, and analyze their primary data or evidence. At the same time, the technological resources available to humanists have grown tremendously. But the behavior of eleven humanists studied over a five-year period suggests that scholars in the humanities are adopting new technologies relatively slowly.

We first interviewed and observed the eleven in 1987–88 when all of us were fellows in our campus Institute for the Humanities. In initial interviews we asked the fellows how they did their work. We not only focused on their fellowship year projects and raised questions about the use of information and libraries, but also encouraged the scholars to discuss topics outside our focus. In addition, we participated in a series of group discussions on methodology and raised questions about scholarly practices in forums that followed the public lectures fellows gave about their fellowship year projects. Whether with individuals or in groups, we spent at least fifty hours with each fellow. In the 1992–93 academic year, we revisited each fellow with an interview of one to two hours. The interviews followed a written list of questions. These questions asked about changes during the past five years in important aspects of
their scholarship with special emphasis on the use of information technology.

In this report, we first discuss how representative the fellows are of other humanists. We then describe their use of information technology in five areas: word processing, use of online public access catalogs (OPACs), bibliographic database searching, electronic mail, and other applications. Finally, we offer a definition of the humanities that serves as a basis for explaining the relatively slow adoption of new technologies by humanists.

**REPRESENTATIVENESS OF THE HUMANISTS STUDIED**

Any study based on eleven persons must ask how representative is that group. Certainly eleven individuals cannot encompass all the varieties of scholarship within the humanities in the proportions in which they are found in the larger population. And since the entire group comes from the same academic institution—a research university in a major metropolitan area in the United States, to name just the principal distinctive characteristics of their environment—their representativeness is further limited. Yet among them, the fellows cover many important aspects of humanistic scholarship.

One way to view the diversity among the fellows is by their departments: anthropology (two), English (three), history (two), history of art (one), philosophy (one), political science (one), and women's studies (one). Some historians see themselves as social scientists, but neither of the historians in the seminar does; nor does the women's studies professor who is conducting historical research. The three seminar members who come from fields usually classified in the social sciences—anthropology and political science—are conducting research that exemplifies the current trend for social scientists to return to the humanistic roots of their disciplines. One of the historians said he did "plain old history"; the other described himself as traditional, not using trendy or novel methods. Two other fellows pursue conventional topics and methods largely within their home disciplines. At the same time, seven fellows do interdisciplinary work: one fellow from English incorporates social science information in her study of film; a literary critic draws on psychoanalysis and philosophy; a historian of art considers his work to be part of American Studies; and the anthropologists, political scientist, and women's studies scholar bring the insights and methods of their disciplines to humanistic sources.

There are two important ways in which the fellows distinguish themselves among humanities scholars. First, they are older than many; the median number of years since obtaining the doctorate was twenty-two, the average twenty, with a range of ten to twenty-nine years. Harriet Lonnqvist and Idrisa Pandit, among others, have found that less experienced humanists behave somewhat differently from seasoned scholars. The fellows fall in the latter category. Second, the fellows are unusually successful in research. Among them are winners of national fellowships and grants as well as authors of prize-winning books. They have sustained through their careers rates of publication well above average.

Despite these distinctive characteristics, the findings about the fellows' use of information technology are probably typical of many other humanists, especially those who are mature and do research. An earlier study of the fellows' information seeking behavior showed that they were consistent with prior findings about humanists: (a) most were the sole authors of their publications; (b) they relied heavily or partially on library collections for their research; (c) they rarely consulted general reference librarians; (d) their use of formal bibliography (as opposed to bibliography in the scholarly literature) was limited. In addition, as we shall see below, their current use of information technology fits what several other studies of humanists have found. In short, the present report offers insight into the use of information technology for research by mature, successful humanists through 1992.
TABLE 1
INFORMATION TECHNOLOGY USED BY HUMANISTS INTERVIEWED

<table>
<thead>
<tr>
<th>Year of Ph.D./Rank</th>
<th>Word Processing</th>
<th>OPAC Use</th>
<th>Database Search</th>
<th>Electronic Mail</th>
<th>Other Applications</th>
<th>Computers Used*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1963/Professor</td>
<td>Yes</td>
<td>In-library</td>
<td>None</td>
<td>Yes</td>
<td>None</td>
<td>Mainframe Home</td>
</tr>
<tr>
<td>1965/Professor</td>
<td>No</td>
<td>In-library</td>
<td>Mediated '87-'89; '89+</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>1968/Professor</td>
<td>Yes</td>
<td>In-library</td>
<td>Mediated '87-'89</td>
<td>None</td>
<td>None</td>
<td>Home</td>
</tr>
<tr>
<td>1969/Professor</td>
<td>No</td>
<td>In-library</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>1970/Professor</td>
<td>Yes/Notetaking</td>
<td>In-library</td>
<td>Mediated '87-'89; '89+</td>
<td>None</td>
<td>Statistical analysis</td>
<td>Home and office</td>
</tr>
<tr>
<td>1975/Associate</td>
<td>Yes/Notetaking</td>
<td>In-library</td>
<td>Mediated '87-'89; '89+</td>
<td>None</td>
<td>Bibliographic database</td>
<td>Home and office</td>
</tr>
<tr>
<td>1976/Professor</td>
<td>Yes</td>
<td>In-library</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Laptop and office</td>
</tr>
<tr>
<td>1978/Associate</td>
<td>Yes</td>
<td>In-library</td>
<td>None</td>
<td>None</td>
<td>OCLC</td>
<td>Home</td>
</tr>
<tr>
<td>1982/Associate</td>
<td>Yes</td>
<td>In-library</td>
<td>Mediated '87-'89</td>
<td>3 times</td>
<td>Spreadsheet</td>
<td>Home</td>
</tr>
</tbody>
</table>

Note: Bold denotes first use after 1988.
*Home and office designates desktop computers at those locations.

FINDINGS FROM THE INTERVIEWS

Technologies Used
Our recent interviews revealed that all of the fellows continue to have as their principal goal writing a book. True, they disseminate the results of their work in other ways as do other humanists. But their emphasis on their books fits with bibliometric studies that show the centrality of the monograph in the humanities. John Cullars’ research has found that the typical humanities monograph has between 250 and 300 pages. Given the length of their books, humanists have great need for mechanisms that enable them to write and revise with ease. The technological innovation that makes this possible is word-processing. Word processing is a regular and essential part of all but two fellows’ lives. Most fellows had adopted it readily, usually at their own expense, on the recommendation of family, friends, or colleagues. Seven of the eleven used word processing in 1987; nine of eleven in 1992 (see table 1).

We gain a sense of how much word processing has captured humanists from the comments of one fellow who adopted it reluctantly. At our first interview, he reported his continued use of a manual typewriter and referred to the computer revolution as a capitalist plot. Revisited, he reported he had been writing with a computer for over four years. Besides word processing, the only widely shared use of computers by the fellows was searching library online public access catalogs (OPACs). Two aspects
of OPAC use deserve mention. First, as residents of a metropolitan area with many academic libraries, some fellows use more than one OPAC. Second, like most OPACs, their campus catalog has changed features from time to time. Most of the eleven took those changes in stride, but four volunteered that they had experienced trouble as a result. Having trouble does not necessarily equate with inability to use. One fellow who reported frustration also said that since 1987 she had downloaded OPAC records to create bibliographies.

The Getty Online Searching Project reports its participants clearly understood that an OPAC was better for finding known citations than were online databases. Similarly, the fellows told us they largely used OPACs to find known items. While the fellows did not have the extraordinary opportunity to search online databases afforded scholars in the Getty project, a librarian had been assigned to them from 1987 through 1989 to do without charge any kind of searching they wanted. She kept a log of what she did and reported spending slightly more time on subject searches than seeking known items. Only three of the eleven reported having had searches done for them since 1989, and one had done a search for herself on a locally loaded database provided at no fee by her campus library. She stressed she did this for her teaching, not her research.

Electronic mail has had a major impact on the lives of many academics and overall at the fellows' home campus use of electronic mail is widespread. Yet only two of the fellows had used e-mail in 1987-88 and only two more used it in the following five years. One of the latter had sent "only about three messages." Use of electronic mail among the fellows, while limited, is in line with use by other groups of humanists. Survey responses in 1990-91 from over 6,700 members of the Modern Language Association revealed roughly one-fifth used e-mail. In interviews during the same

time with twenty-one humanists, Idrisa Pandit found two users.

Besides word processing, searching OPACs, and electronic mail, what other uses have the fellows tried with their computers? One person has developed a large database that describes the art works he is studying. A second kept separate bibliographies for her two major research interests using a bibliographic software package. A third did statistical analyses of demographic data she had gathered. These three and one other fellow take notes on their computers using their word-processing software. A fifth fellow searches OCLC to locate copies of titles that he later obtains through visit or interlibrary loan. A sixth fellow uses a spreadsheet to keep track of family finances.

Expansion of Use of Technology

The range of use of computers by some of the fellows suggests, just as the Getty Online Searching Project did, that humanists have potential for using information technology. But despite their potential, the group has been slow to expand its use of information technology. Only six have gone beyond word processing and OPACs, and each of these is limited to one or two regularly used new applications. Their slowness might be attributed to lack of funds. And certainly the fellows are not as well funded as scientists and social scientists of comparable achievement. But while limited funding may be a factor, it made no difference in the adoption of word processing for almost all of the fellows.

Noteworthy in this regard is one fellow who had been granted several thousand dollars as a university scholar to support his work in any way he chose. He was still using a computer whose normal storage capacity he described as thirty-five pages. He wanted to buy a new machine and planned to do so, but he had been a university scholar for two years at the time of our second interview and still had not purchased it. Money was not a factor in his case.

While lack of money may be only a minor factor in slow adoption of infor-
information technology, frustrating experiences with computers and hearing reports of such experiences may play a greater role. A common feature of our interviews was what we call "computer horror stories." These are tales of long hours of frustration or failure or both. One fellow reported spending so much time inputting and trying to print a database of bibliographic references that she concluded she could have typewritten it as quickly. She compiled a second bibliography with the same software, but repeatedly failed to print out the second in the same format as the first. Another fellow characterized the amount of time she had spent learning to use a computer as "ridiculous." A third fellow described how he had composed a letter of recommendation on his computer at home, brought a disk to campus to print on a printer better than his at home, failed because of software incompatibility, and ended having the departmental secretary rekey and print it. A fourth fellow was repeatedly frustrated in early attempts to print out her writing. She continued to do word processing, but delegated all other computer work to assistants. A fifth fellow did her first book on the mainframe. She found the mainframe consultants very friendly as they helped her learn the system. But because it worked so poorly, the experience made her hesitant to spend time learning new applications.

Of course, all users of computers or any other technology have similar stories to tell. The question is why these might inhibit adoption in the humanities more than in other fields. And the differences in use of technology are clear, once the nearly universal word processing and searching OPACs are set aside. Humanists use information technology less than scientists and social scientists for communication (e-mail), bibliographic searching, and storage, transmittal, and analysis of primary evidence. In most fields in the sciences and social sciences, at least a majority and in some fields virtually all use electronic mail, not the roughly 10 percent to 30 percent found by the large-scale MLA survey, Pandit, or this study. Comparative data on online bibliographic database searching by scholars are limited, but what exists suggests far greater use by scientists and social scientists than humanists. As for data storage, transmittal, and analysis, most laboratory equipment in the sciences has computer components and many scientific fields, such as oceanography, rely heavily on data shared over networks. Indicative of the difference between the social sciences and the humanities in use of information technology for data storage, transmittal, and analysis is a comparison of the founding dates of the Interuniversity Consortium for Political and Social Research—1962—and the Center for Electronic Texts in the Humanities—1991.

DISTINCTIVENESS OF THE HUMANITIES

In reflecting on the differences among the sciences, social sciences, and humanities, we have been trying to identify the characteristics of the humanities that differentiate them from the sciences and the social sciences and that might explain at a basic level the distinctiveness of humanists' behavior. This reflection has brought us to the following definition of the humanities: those fields of scholarship that strive to reconstruct, describe, and interpret the activities and accomplishments of men and women by establishing and studying documents and artifacts created by those men and women. Crucial to this definition and to the distinctiveness of the humanities is the primary evidence or sources humanists use: documents and artifacts created by persons whose activities and accomplishments the humanist seeks to reconstruct, describe, and interpret.

To better understand this definition, it is useful to look at all scholarship as a continuum from the physical sciences to the quantitative social sciences to the qualitative social sciences to the humanities. Moving along this continuum from the physical sciences to the humanities, one can say roughly that the scholar exercises decreasing control over the primary evidence that is analyzed. We
suggest the proposition that the less control over primary evidence the scholar has, the harder it is to utilize information technology. The rest of this article attempts to develop this proposition by discussing the humanities and contrasting them at places to the social sciences, especially survey research.

**The Humanities and the Social Sciences**

Like the humanities, the social sciences also attempt to describe and explain the activities and accomplishments of men and women. The overlap between the practice of the humanities and the social sciences is great enough that it can be difficult to separate the two. Yet there is a difference. Comparison of the work of humanists with that of social scientists shows that fundamentally humanists use sources created by the subjects of their research, while social scientists initiate and, much more than humanists, participate in the creation of their sources. This is a fundamental difference, not because there are no exceptions to it (there are many), but because it points to what predominates in each area of scholarship.

Emphasizing that humanists use documents and artifacts created by persons whose activities and accomplishments the humanist studies is not to say that humanists never have a hand in shaping the evidence they use. When humanists edit primary sources, their judgment and imagination may determine the content of parts of the source. But in the humanities the primary source is there first, and ultimately, humanists measure their success and condemn each other’s failures in editing by how well the edited version measures up to the original and its variants. At the same time, we cannot say that social scientists invent their evidence as a novelist writes fiction. When social scientists conduct a survey, the responses of those surveyed are the evidence. But in the social sciences, no source exists until social scientists begin work. Through their survey instruments, social scientists limit the range or specify the particulars of their subjects’ responses.

Because the subjects of humanistic research create the primary evidence of the humanities, these sources are the products of a specific place and time and shaped by the distinctive personalities of their creators. Since these sources are not products of social scientific method, they are multifarious, often incongruous and diffuse, and harder to coordinate and manipulate than survey research data. For example, in discussing historical evidence about location, age, and value of currency—phenomena that can be described quantitatively—Manfred Thaler shows how primary sources can confound efforts to pin down specifics by latitude and longitude, date, and a standard exchange rate. Regarding exchange rates he writes:

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We suggest the proposition that the less control over primary evidence the scholar has, the harder it is to utilize information technology.

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When comparing the temporal and spatial frames derived from the source with the entries in the currency database, check whether these frames are close to a point where different ones would apply (i.e. whether the exchange rate changed shortly before or after our information was fixed in writing, or the place where it was recorded lies very close to a border between two territories with different coinage). It should be emphasized again and again that considerations like these are just the beginning. Given that phenomena described quantitatively can be this hard to handle, one recognizes there will be even greater difficulty treating literary, artistic, or other sources that have primarily qualitative and aesthetic dimensions.

**Primary Evidence, Secondary Literature, and Technology**

The nature of the humanist’s evidence affects how a humanist analyzes it and writes it up. Current information technology is less useful for analysis of the
humanist's primary evidence than for the social scientist's primary evidence. Humanistic evidence is not easily categorized and entered into a relational database and not readily subjected to quantitative measure or statistical analysis. Regarding categorization of evidence, Donald Case's research has revealed that because historians find categorization difficult, they tend to change their categories during the course of a project, particularly during the write-up. Sometimes historians place a single piece of evidence in two or three categories. Case's research helps us understand why historians who have great interest in using computers to analyze primary evidence emphasize the difficulty of creating machine-readable databases from the original sources. True, humanists can subject some evidence, like demographic records, to computer analysis. Also, humanists can take any text file and subject it to quantitative linguistic analysis. But evidence like demographic records that derive from a social science tradition is only a small portion of the surviving documentary record. And quantitative linguistic analysis is just one method and some humanists argue against it, even when a strong case can be made for its use.

It is instructive to contrast the humanist to a social scientist who has quantitative data needing analysis, for example, a thirty-item questionnaire returned by more than three hundred respondents. Even if it takes the social scientist many hours to get the hardware and software running, the results will appear in seconds, and, perhaps most important, far more accurately than with calculations done by hand. In contrast, humanists, whose sources are nineteenth-century English literature or proceedings of 1890s state political conventions or American films, have no generally accepted software package that can analyze such evidence according to the interpretive viewpoints that are evolving in their minds.

Given the humanist's evidence, it is more difficult for humanists to collaborate than social scientists. Because their evidence is not created according to a set of rules that yield data falling into crisply differentiated categories that welcome quantitative analysis, their work cannot easily be divided into discrete tasks that different members of a research team can perform separately and later assemble. Likewise, the uniqueness and scatter of humanistic data invite individual, not collaborative, interpretation. Consequently, humanists normally take sole responsibility for their projects. True, as Pandit has shown, they consult other scholars. But consultation for humanists is more limited than for social scientists who share responsibility for projects. Since humanists write alone, we would expect that they would begin to communicate electronically later than social scientists and that their use would be more limited. Interestingly, in a conversation in fall 1993, the fellow who had earlier reported about three uses of electronic mail, stated he had been using it much more since that earlier report. He added that in general he did not like it, but that he had found it very beneficial for exchanging drafts and comments with the second author of the first coauthored publication of his career.

Since humanists write alone, we would expect that they would begin to communicate electronically later than social scientists and that their use would be more limited.

Finally, given that the primary evidence humanists use is the product of a specific place and time, shaped by the distinctive personality of its creator and not easily categorized, ordered, and manipulated, we would expect that humanists must write at greater length than social scientists to describe and explain their topics. First, since little of what they find is quantitative, they cannot summarize results in a few tables. Second, and more important, the unique features of the evidence must be made known and differentiated from analogous evidence. Helen Tibbo's research on abstracting for the humanities shows
how historians want abstracts above all to contain specific dates, time span indicators, and names of geopolitical units, individuals, and groups that are found in the work being abstracted. Such elements are unknown in scientific and social scientific abstracts she studied.\textsuperscript{22} Description and explanation of such phenomena fill the pages of humanities monographs.

In providing service, practitioners need to be sensitive to the preferences of those who those who eagerly adopt new applications of technology, those who want to use as little technology as possible, and those who fall in between.

Thus, the standard report of research in the humanities is a 250- to 300-page monograph. Clara Chu found literary scholars reported taking between four and nine years to complete a book.\textsuperscript{23} The fellows fall within that range. This allows the humanists few significant breaks in their workflow. Lacking these breaks, humanists are reluctant to take time from their projects to buy, install, and learn to use new hardware or software. One fellow, who in 1992 was finishing the book he had started in 1985, told us that he had purchased his first computer after he completed a book and before he began working on his present project. He now used his computer for all his writing. He stated that once he completed his current book, he would buy a new machine and explore adopting new uses such as taking notes.

Here, it is worth pointing out the tremendous reading load the monographic literature places on humanists. Several fellows remarked about not having time to read the journals to which they subscribed. The librarian who did searching for the fellows suspected they sometimes did not want her to supply them with more references because they already had enough to read.\textsuperscript{24} Humanists' limited use of comprehensive bibliographic sources like \textit{Historical Abstracts} and the \textit{MLA Bibliography} is well documented in the literature.\textsuperscript{25} Even investigators in the Getty project concluded that the humanists they studied "took less advantage of the opportunity [to search DIALOG] than might have been expected."\textsuperscript{26} Perhaps one reason for humanists' limited use of bibliographic databases is the numerous bibliographic references they encounter in the monographs they read. Unlike those found in bibliographic databases, these references appear in the context of scholarly writing which helps the humanist assess their relevance.

In summary, given the difficulty of analyzing their evidence with readily available software, the rarity of coauthorship, and the abundance of references to the secondary literature in the monographs they read, it is understandable that humanists have not employed information technology to the extent that other scholars have. We have suggested that this difference can ultimately be attributed to the primary evidence that humanists use.

\textbf{CONCLUSION}

In the future more and more of the documents and artifacts that people create will be products of information technology. Also, many sources from the precomputer era are being converted into machine-readable form. Given that humanists establish and study documents and artifacts, the growth in those that are technologically based argues strongly that humanists will have greater involvement with information technology. Furthermore, as the percentage of humanists communicating electronically grows, those who do not use e-mail will have increasing reason to do so or lose contact with their peers. But it is not certain how much technology humanists will demand. Developments in scholarly methods and individual preferences will play major roles in the outcome. Historically, particular scholarly methods and approaches wax and wane. Examples are numerous. The philological approach to literature—one seemingly suited to computerization—gave way to criticism. Today's critics show little in-
terest in computers.\textsuperscript{27} Around 1970 historical demography was a central concern in early American history; today it is on the margins of the field.\textsuperscript{28} Phyllis Franklin has noted that at the same time that literary scholars' use of electronic communication is increasing, their preoccupation with print is intensifying. For large numbers of scholars, digitized copies cannot replace originals.\textsuperscript{29}

On an individual level, the experience of the fellows suggests that mature humanists will expand their use of technology slowly. While scholars with ten to thirty years' experience will eventually give way to younger persons, they will still be a substantial proportion of humanists for the next twenty-five years. Responsive library service will not ignore their preferences. Furthermore, table 1 shows that the heaviest users of technology were not the youngest fellows, but two who received their Ph.D.'s in 1970 and fall in the middle of the age distribution. Interestingly, one of these two did not use word processing in 1987. Also, a fellow who received her Ph.D. in 1975 had assistants search bibliographic databases and run statistical software for her, but restricted herself to word processing. These case histories suggest there is no guarantee that youth and increased use of technology walk in lockstep. In all, the fellows' behavior reminds us some humanists will use technology much more heavily than others. Findings of the Getty online searching project corroborate this observation.\textsuperscript{30}

The field of library and information science has been so stimulated by developments in information technology that it is easy for librarians to lose sight of users who have limited interest or need for technology. In providing service, practitioners need to be sensitive to the preferences of those who eagerly adopt new applications of technology, those who want to use as little technology as possible, and those who fall in between. This is a difficult assignment. Continued research to monitor changes in the disciplines and in patterns of individual behavior is essential for success at this task.

REFERENCES AND NOTES


12. For bibliographic computer horror stories see Betty S. Travitsky, "The Online Database: A Useful Tool for Interdisciplinary Study?" ACLS Newsletter 2d ser. 4 (Summer/Fall 1993): 7-10; Oleg Grabar, "The Intellectual Implications of Electronic Information" (paper given at Technology, Scholarship, and the Humanities: The Implications of Electronic Information, Irvine, Calif., Sept. 30/Oct. 2, 1992 currently available by FTP from cni.org.)


16. Social scientists who do secondary and meta-analysis do not participate in the creation of sources they use. But other social scientists participate in the creation of these sources. Creation of such evidence under social science rules and conventions makes it far different from evidence used by humanists.


24. E. Paige Weston, personal communication.


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Academic Library Committees: Their Role in Participative Management
Mary Ann Sheble and Debra W. Hill

The growing number of committees in academic libraries has been equated with the rise of participative management as a way of organizing library operations. But there is little empirical evidence to support this assumption. This study examines this issue through survey data from a random sample of librarians in U.S. academic libraries. The study shows that not all libraries use committees in significant roles, and that the presence of committees does not guarantee that librarians will have a significant voice in their organization. Librarians who serve on committees with policy-related functions were positive about their committee service and about the ability of committees to benefit the organization. Librarians serving on fact-finding and information-gathering committees tended to be negative about their committee service and conservative in their belief about the ability of committees to influence the management of their organization. Smaller libraries were much more likely than larger libraries to involve committees in significant decision-making roles.

According to Louis Kaplan, while participative management “made its debut in the third decade of the 20th century...in an industrial plant in...Illinois,” it was not until the seventies that the management style became acceptable in academic libraries.\textsuperscript{1} Referring to the student revolts of that decade as well as to management theories espoused by Rensis Likert, Maurice Marchant, and David Kaser, he stated that “it was the combination of violence and managerial theory that provided the combustive material” that precipitated the acceptance of the new management theory in American academic libraries.\textsuperscript{2} Participative management is an approach that stresses worker involvement in management decision making.\textsuperscript{3} Many have embraced this theory of management because it offers a multitude of benefits to individuals involved as well as to their institutions.

According to Maurice Marchant, “Group decision-making has two major advantages over decision-making imposed unilaterally by management; these are that group decisions tend to be of superior quality and they tend to be more readily accepted by the group.”\textsuperscript{4} The literature supports the theory that those who participate in the decisions involving their work are much more satisfied than those who have little input. This theory certainly applies to academic librarians who thrive on their capacity to work out problems that are...
“not neat, not well formed” but are exactly the type of problems faced by administrators. As professionals, often with faculty status, academic librarians expect to be involved in decision making at the goal- and policy-formation levels.

What evidence do we have of decision making by nonmanagerial professionals in American academic libraries? Maurice Marchant noted in 1971 that no study of library staff participation in decision making had been reported prior to that time. In 1988 Louis Kaplan reported that the number of libraries in which participative management was being practiced was still unknown.

While the use of committees in academic libraries has become common, there is limited evidence that they are functioning as a mechanism for rank-and-file librarians to significantly influence the goals and structure of their libraries.

Perhaps one significant piece of evidence is the widespread use of committees. Richard Eggleton noted in 1979 that “academic libraries ... have found the committee process an attractive means of implementing a form of participative management.” He said that “academic libraries have found the committee structure extremely useful in studying and recommending action on a variety of technological, social, and policy issues facing libraries.” Stanley Seashore is another advocate of committee use in libraries and views the committee as an important component of participative practices. At the seventy-fifth meeting of the Association of Research Libraries, Seashore suggested steps for implementing participative management in academic libraries. His suggestions include “increasing the frequency of use of committees ... with membership including lower-rank people, for the preparation of proposals for technological, policy and program changes.”

Although the committee is often cited as a mechanism through which participative management is implemented, there is little systematic research to support this application in libraries. Casual observation leads us to conclude that committees have become an integral part of most American academic libraries, but the role that they play in the management of these libraries is not clear. More specifically, while the use of committees in academic libraries has become common, there is limited evidence that they are functioning as a mechanism for rank-and-file librarians to significantly influence the goals and structure of their libraries. The purpose of this study is to investigate this issue through examining the following questions:

1. Who is serving on committees? Are committees in academic libraries involving professionals of all ranks, including line-level employees?
2. Are committees being used in significant ways in academic libraries? Are participants satisfied with the role that committees play in their libraries?
3. How do committees benefit their host organizations? Do participants derive any personal benefits from committee service?
4. Does committee use and effectiveness vary systematically across different types of libraries? For example, are there differences between small and large libraries, and libraries with different degrees of physical centralization?

In addition to exploring these questions, the study attempts to document the extent of committee use in academic libraries. Through this, we hope to provide a base on which other research can build to assess future directions in committee use.

STUDY DESIGN

In January 1993 surveys were mailed to a random sample of potential respondents in U.S. academic libraries. The return rate was 57 percent. Since respondents were assured of anonymity, there were a limited number of variables...
on which we could compare respondents and nonrespondents to look for possible sources of systematic bias. An analysis of library size and position did not show any systematic differences between those responding to the survey and those who did not return their surveys.

Items for the survey were selected from the literature on committees and participative management, and from the experience we have gained by serving on committees in academic libraries. The survey instrument was pretested with a group of thirty-two academic librarians at the University of Alabama Libraries.

**WHAT TYPES OF LIBRARIES/SITUATIONS EMPLOY COMMITTEES?**

The initial phase of our analysis explored the extent that committees are used in academic libraries, and identified variations in this use. As expected, all respondents reported that their libraries use committees and all but three respondents (4 percent) reported that they had served on one or more committees within the past year. All but ten respondents (14 percent) were serving on at least one committee at the time they completed the survey. On the average, the librarians in our sample reported serving on between four and five committees during the past year (X=4.52 percent).

One of the most frequently cited disadvantages of committees is their significant cost to organizations, primarily in terms of staff time. Salaries paid to individual participants for time spent in meetings and preparing for meetings are one of the direct costs. Indirect costs include time away from regular duties and responsibilities, as well as personal costs to individuals for time spent on committee activities outside of regular work hours.

Despite the prevalent use of committees in academic libraries, librarians do not appear to spend as much time in committee meetings as their corporate counterparts. A survey of 1,200 corporate employees conducted by the *Harvard Business Review* found that their respondents spent an average of 14.6 hours per month in committee meetings. This compares to 6.7 hours per month reported by the librarians in our sample. In fact, over half (55 percent) of the librarians who responded to our survey reported spending less than 5 hours per month in meetings. But for librarians, the time spent in meetings is only the beginning of the commitment required for committee work. Respondents estimate that they spend a similar amount of time each month on committee-related work, with 61 percent of the respondents reporting that part of this work is completed outside of regular work hours.

In addition to an overview of committee participation, we looked at variations by several organizational and personal variables. The two main organizational variables tapped by our survey are the size of the library and the degree of physical centralization. Libraries were classified as having a central library only or a decentralized arrangement. Library size was determined on the basis of ARL collection categories. For our analysis, we collapsed the initial categories into “small” (under 300,000 volumes), “medium” (300,000, but less than one million volumes), and “large” (one million and over).

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Our results show that faculty status does not influence the level of committee activity in libraries.

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The degree of physical centralization does not appear to influence the extent of committee use in libraries. Librarians report a similar number of committee assignments per person and time spent in committee meetings and on committee-related work regardless of the organization of their libraries. Our analysis of the relationship between library size and committee participation shows some interesting variations (table 1). The highest level of committee participation was reported in medium-sized libraries with collections between 300,000 and one million volumes. Approximately 75 percent of all respondents working in libraries of this size reported that they had served on four or
<table>
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<tr>
<th>Committee Participation</th>
<th>Library Size</th>
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<tbody>
<tr>
<td>4 or more committees in past year</td>
<td>Small</td>
<td>N</td>
<td>%</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38</td>
<td>22.2</td>
<td>75.0</td>
</tr>
<tr>
<td>3 or more committees currently</td>
<td></td>
<td>25</td>
<td>11.1</td>
<td>55.0</td>
</tr>
</tbody>
</table>

For committees in past year: $x^2 = 9.7987; df = 4; p = .0439.$

For current committee: $x^2 = 8.1147; df = 4; p = .0875.$

more committees within the past year. Respondents working in libraries with collections exceeding one million volumes reported a slightly lower level of committee participation. Respondents who work in smaller libraries reported serving on fewer committees.

We also looked at the relationship between faculty status and committee participation. Our results show that faculty status does not influence the level of committee activity in libraries. Those without faculty status reported serving on almost as many committees as did their colleagues with faculty status, and reported spending slightly more time in committee meetings and on committee-related work.

This finding did not support our expectations. Committee service is frequently required as part of the criteria for tenure in academic libraries. In fact, 84 percent of our respondents in libraries with faculty status indicated that committee activities are considered in tenure decisions. We also expected that those with faculty status might demand a greater degree of self-governance, and that this would be reflected in a high level of committee participation in libraries with faculty status. Neither of these expectations was supported by our analysis.

**WHO IS SERVING ON COMMITTEES?**

One of the major tenets of participative management is the structured opportunity for employees to participate in significant organizational decision making outside of their own subordinate pyramid. If committees in academic libraries are serving in this capacity, they will show evidence of involving personnel from a variety of service areas and position levels. The level of our respondents' committee participation was measured through the following survey items:

- Number of committees served on during the past year
- Number of committees respondents were serving on at the time they completed the survey
- Number of hours per month spent in committee meetings
- Number of hours per month spent on committee-related work (excluding time in committee meetings).

Who is serving on committees and to what extent? The answer is just about everyone to some degree. Respondents in technical services reported serving on fewer committees than those in public services, special division departments, and administration (table 2). However, the relationships between service area, and time spent in committee meetings and time spent on committee-related work are highly nonsignificant. While technical services personnel may not be involved in as many committees as others, our analysis suggests that their time-commitment for committee-related work is just as intensive as their colleagues in other service areas. An analysis of committee participation variables by position level does not show any significant differences. Managers,
TABLE 2
COMMITTEE PARTICIPATION BY LIBRARY SERVICE AREA

<table>
<thead>
<tr>
<th>Committee Participation</th>
<th>Library Service Area</th>
</tr>
</thead>
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<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>4 or more committees in past year</td>
<td>39</td>
</tr>
<tr>
<td>3 or more committees currently</td>
<td>26</td>
</tr>
<tr>
<td>5 or more hours/month in committee meetings</td>
<td>35</td>
</tr>
<tr>
<td>6 or more hours/month on committee-related work</td>
<td>25</td>
</tr>
</tbody>
</table>

For committees in past year: \( x^2 = 10.2030; df = 6; p = .0332 \).
For current committees: \( x^2 = 10.2996; df = 6; p = .0049 \).
For hours in committee meetings: \( x^2 = 7.216; df = 6; p = .1719 \).
For hours on committee-related work: \( x^2 = 2.6912; df = 6; p = .3250 \).

supervisors, and line-level employees reported serving on a similar number of committees and spending a similar amount of time on committee-related work.

HOW ARE COMMITTEES BEING USED?

An additional tenet of participative management is the involvement of rank-and-file employees in significant decision making that impacts the goals and standards of their organization. To assess the extent that committees provide this opportunity for academic librarians, we asked respondents to list up to six functions that committees perform in their libraries. Responses were grouped into five categories: (1) exchanging information and ideas, (2) problem solving, (3) advising and recommending, (4) establishing policy, and (5) implementing policy (table 3).

The most frequently cited function of committees is “advising and recommending.” In fact, over 98 percent of the respondents reported that committees are used in their libraries for this purpose. “Problem solving” is second in frequency and was cited by 86 percent of the respondents. This is followed by “exchanging ideas and information” (nearly 70 percent), “establishing policy” (almost 67 percent), and “implementing policy” (52 percent).

This overview shows that a number of libraries are using committees for significant activities and suggests a shift in library management policy over the past twenty years. Maurice Marchant began his 1976 publication of Participative Management in Academic Libraries with the following statement: “The normal management style in today’s American university libraries is authoritarian, characterized by a director who makes decisions regulating the library but usually allows staff reaction before formalizing them.” That approximately two-thirds of the respondents indicate that committees are used for establishing policy and over a half cite “implementing policy” as a committee function indicates that, at least in some libraries, committees are performing roles that were typically reserved for administrators in previous years.
TABLE 3
FUNCTIONS OF COMMITTEES IN ACADEMIC LIBRARIES

<table>
<thead>
<tr>
<th>Committee Functions</th>
<th>N of Responses</th>
<th>% of Responses</th>
<th>% of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchanging ideas and information</td>
<td>48</td>
<td>18.7</td>
<td>69.6</td>
</tr>
<tr>
<td>Problem solving</td>
<td>59</td>
<td>23.0</td>
<td>85.5</td>
</tr>
<tr>
<td>Advising and recommending</td>
<td>68</td>
<td>26.5</td>
<td>98.6</td>
</tr>
<tr>
<td>Establishing policy</td>
<td>46</td>
<td>17.9</td>
<td>66.7</td>
</tr>
<tr>
<td>Implementing policy</td>
<td>36</td>
<td>14.0</td>
<td>52.2</td>
</tr>
</tbody>
</table>

Percentages for cases add up to more than 100% because most respondents listed multiple functions.

TABLE 4
COMMITTEE FUNCTIONS BY SIZE OF LIBRARY

<table>
<thead>
<tr>
<th>Committee Functions</th>
<th>Library Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Small %</td>
</tr>
<tr>
<td>Exchange ideas and information</td>
<td>50.0</td>
</tr>
<tr>
<td>Problem solving</td>
<td>80.0</td>
</tr>
<tr>
<td>Advising and recommending</td>
<td>90.0</td>
</tr>
<tr>
<td>Establishing policy</td>
<td>90.0</td>
</tr>
<tr>
<td>Implementing policy</td>
<td>70.0</td>
</tr>
</tbody>
</table>

Respondents could reply to multiple categories of the dependent variable. Percentages are based on the number of respondents replying to each category.

Our interest centered on libraries where committees are being used for policy-related functions because this indicates a strong role for committees within the library, and suggests that committees are promoting employee involvement in the management of library operations. To better understand this relationship, we analyzed the five committee functions across organizational variables.

It appears that committees in small academic libraries actually are being used more often in significant roles than in medium-sized and larger libraries.

Library size was the only variable on which significant differences were found (table 4). The smaller the library, the more likely the respondents were to mention stronger roles for committees. Approximately 90 percent of all respondents from smaller libraries mentioned “establishing policy” as a committee function, compared to about 62 percent of respondents in medium and large libraries. The difference among libraries of different sizes is even greater for the “implementing policy” category. Approximately 70 percent of respondents in small libraries mentioned “implementing policy” as a committee role, as compared to 38 percent of those in medium-sized libraries and 54 percent in large libraries.

In an attempt to explain these findings, we analyzed the relationship between committee participation and position level, controlling for library size. If management is overrepresented on committees in the smaller libraries in our sample, it may be that the representation of management, rather than the size of the library, is accounting for the stronger role of committees in smaller libraries. This reasoning was not supported by our analysis. It appears that committees in small academic libraries actually are being used more
TABLE 5
PERCEPTIONS OF HOW COMMITTEES SHOULD BE USED

<table>
<thead>
<tr>
<th>Committee Functions</th>
<th>Strongly Agree/Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The main role of a committee should be to exchange ideas and information.</td>
<td>19  31.1</td>
</tr>
<tr>
<td>A committee should be able to recommend, but never to decide.</td>
<td>21  31.8</td>
</tr>
<tr>
<td>Committees should be used to establish library policies.</td>
<td>31  50.0</td>
</tr>
<tr>
<td>Committees should be used to implement library policies.</td>
<td>34  54.0</td>
</tr>
</tbody>
</table>

Percentages are based on the number of valid responses received.

often in significant roles than in medium-sized and larger libraries.

HOW SHOULD COMMITTEES BE USED?

The previous section describes committee performance in libraries. But we were also interested in respondents' opinions about the roles that they would like to see committees play in their libraries. Respondents' perceptions were measured through the use of a Likert-type scale on the statements in table 5. Response categories were: Strongly Agree, Agree, Disagree, and Strongly Disagree. The combined responses in the Strongly Agree and Agree categories are shown in table 5.

An overview of the responses shows that the majority of librarians in our sample are dissatisfied with the use of committees solely for fact-finding and advising. Only about 31 percent of the respondents believe that the main role of a committee should be information exchange. A similar percentage agreed with the statement “A committee should be able to recommend, but never to decide.” Our respondents were split on their opinions about giving committees the authority to establish and implement policy. About 50 percent of our respondents would like to see committees establish policy and 54 percent would like committees to have the authority to implement policy.

To better understand these relationships, we looked for variations across organizational and personal variables. We were especially interested in the relationship between library size and respondents' opinions on committee use, since our analysis showed that smaller libraries are using committees for policy-related decisions more often than larger libraries. While none of the relationships between library size and the five committee function variables was statistically significant, our analysis shows some interesting trends. Respondents in smaller libraries like the role that committees are assuming in their libraries and would be dissatisfied with the use of committees in less significant ways. Only 12.5 percent of the respondents from small libraries agreed with the statement, “The main role of a committee should be to exchange ideas and information.” The positive response rate of these librarians rises at each level of increased authority for committees, with the policy-related functions showing the highest level of agreement. In fact, nearly 56 percent agree that committees should be used to establish policy and 71 percent believe that committees should have the authority to implement policy.

While respondents from medium-sized and large libraries show dissatisfaction with information-exchanging roles, they are split on their opinions about the use of committees for establishing and implementing policy. While the majority of these respondents seem to want committees to play a more significant role in library management, about half indicate reluctance to give committees the authority for implementing and establishing policy.

PERSONAL BENEFITS OF COMMITTEE SERVICE

As discussed, the literature is full of information supporting the idea that individuals who participate in decisions
ATTITUDES OF LIBRARIANS TOWARD PERSONAL BENEFITS OF COMMITTEE SERVICE

<table>
<thead>
<tr>
<th>Benefits of Committee Work</th>
<th>Very/Somewhat Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chance to influence library policy and operations.</td>
<td>63 94.0</td>
</tr>
<tr>
<td>Gaining knowledge of operations in other departments of the library.</td>
<td>63 91.3</td>
</tr>
<tr>
<td>Becoming better acquainted with co-workers</td>
<td>55 82.1</td>
</tr>
<tr>
<td>Learning about the library's administrative policies and management philosophy.</td>
<td>52 76.5</td>
</tr>
<tr>
<td>Chance to influence hiring decisions.</td>
<td>49 75.4</td>
</tr>
<tr>
<td>Chance to learn about new products and resources for libraries.</td>
<td>47 74.6</td>
</tr>
<tr>
<td>Gaining recognition for knowledge and abilities</td>
<td>39 60.9</td>
</tr>
<tr>
<td>Learning about library operations within my department.</td>
<td>32 51.6</td>
</tr>
<tr>
<td>Relief from routine job duties.</td>
<td>20 30.3</td>
</tr>
</tbody>
</table>

Percentages are based on the number of valid responses received.

Table 6 shows the distribution of positive responses (very important, somewhat important) for each statement. The most notable trend in the distribution is the large number of items receiving a positive response. While the majority of librarians in the sample do not see committee work as providing relief from routine job duties (about 70 percent) and only about half see committee service as a way to increase their knowledge about library operations within their own departments (nearly 52 percent), most agree that committee work provides opportunities for job enrichment and avenues for influencing library policy. The category "chance to influence library policy and operations" received the highest number of positive responses (94 percent), followed by "gaining knowledge of operations in other departments of the library" (91 percent). Respondents also value the social dimension of committee work. Eighty-two percent of the sample rated "becoming better acquainted with co-workers" as either "very important" or "somewhat important." Despite the positive attitude respondents hold toward the personal benefits of committee work, only about 56 percent believe that committee service helps them perform their jobs better.

Involving their work are more satisfied than those who lack this input. This has been documented by a number of studies that have correlated dimensions of job satisfaction with levels of employee participation in workplace decision making. Our interest in this issue is similar in that it centers on looking at the relationship between job satisfaction and employee influence through committee service. But we decided to take a slightly different approach to investigating the issue. An important dimension of job satisfaction is the extent to which individuals believe their personal needs are being met through their work. We attempted to assess the extent to which committee work contributes to this perception. Our respondents' perceptions were assessed through a series of statements about the personal benefits of committee work. These statements were constructed on the basis of the literature on committee functions.

Our respondents were asked to rank the statements in table 6 as very important, somewhat important, or not important. An additional item, "Serving on committees helps me perform my job better" (table 11) taps global perceptions of the benefits of committee work for library positions. Responses to this item are included in this part of our discussion.
TABLE 7
PERSONAL BENEFITS OF COMMITTEE WORK BY LIBRARY ORGANIZATION

<table>
<thead>
<tr>
<th>Benefits of Committee Work</th>
<th>Library Organization</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Centralized %</td>
<td>Decentralized %</td>
</tr>
<tr>
<td><strong>Becoming better acquainted with coworkers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very important</td>
<td>20</td>
<td>56.3</td>
<td>21.6</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>35</td>
<td>37.5</td>
<td>56.9</td>
</tr>
<tr>
<td>Not important</td>
<td>12</td>
<td>6.3</td>
<td>21.6</td>
</tr>
<tr>
<td>Total N</td>
<td>67</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gain knowledge of other departments</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very important</td>
<td>24</td>
<td>56.3</td>
<td>28.3</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>39</td>
<td>37.5</td>
<td>62.3</td>
</tr>
<tr>
<td>Not important</td>
<td>6</td>
<td>6.3</td>
<td>9.4</td>
</tr>
<tr>
<td>Total N</td>
<td>69</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For becoming better acquainted with coworkers: $x^2 = 7.3771; df = 2; p = 0.0099$.
For gaining knowledge of other departments: $x^2 = 4.2366; df = 2; p = 0.0733$.

To better understand our respondents’ perceptions of the personal benefits of committee service, we analyzed the data by several organizational and personal variables. We originally expected that those in physically decentralized organizations would place a high premium on activity that would enhance their acquaintance with the personnel and operations of the larger organization. Our analysis shows the opposite trend (table 7). The benefits of “becoming better acquainted with coworkers” and “gaining knowledge of operations of other departments in the library” were ranked as “very important” more often in centralized organizations than in decentralized systems. Our findings may be explained by the familiarity with autonomy that has been gained by respondents in decentralized systems, and this may lead to their feeling less of a need for awareness about and influence in the larger organization.

Respondents in small libraries were less concerned with learning about other departments through committee work, probably because those in small institutions already have extensive knowledge about other areas (table 8). Those in large libraries were also somewhat less interested in this aspect of committee work than their colleagues in medium-sized libraries, possibly because, in very large institutions, the expectation to know everyone and everything is less feasible than in smaller organizations. Respondents in large libraries, however, find the opportunity to learn the administration’s policies and management philosophy more important than respondents in small and medium-sized libraries do.

Respondents in small libraries found influencing library policy and hiring decisions to be significantly more important than did respondents in larger libraries. This finding complements our earlier discussion of the relationship between library size and committee use. Small libraries are much more likely than larger libraries to use committees for establishing and implementing policy and have personnel who believe in a strong role for committees within their libraries.

Line and management-level respondents were twice as likely as those in supervisory positions to report that committee work helps them do their jobs better. Supervisors were, however, very interested in influencing library policy, no doubt because they are often at the front line when it comes to implementing policy (table 9). Managers reported interest in influencing library policy through committee work, while line-level librarians found learning more
Our respondents indicate that they receive a number of benefits from their participation in committee work. As discussed, one of the major principles of the participative style of management is the involvement of a wide cross section of employees in significant decision making. That the majority of librarians in our sample (94 percent) rated the statement "chance to influence library policy and operations" as important to them suggests that our respondents see committees as an avenue for influencing the management of library operations. This perception did not vary significantly by position rank, position, or service area. Librarians of all position levels and service areas value this function of committee work. Another interesting trend is the importance of committee service as about library operations within their own departments to be an important function of committee work. Respondents without faculty status were more likely than those with faculty status to value committee work as a way to gain recognition for their knowledge and abilities, and provide relief from routine job duties (table 10). For respondents with tenure requirements, it may be that publication activities and participation in professional associations outside the library are substituting or complementing the need for internal recognition in the library through committee service. Committee work may also be viewed by these respondents as an obligation added to publication and professional activities, and additional time away from primary job responsibilities.

### TABLE 8
PERSONAL BENEFITS OF COMMITTEE WORK BY LIBRARY SIZE

<table>
<thead>
<tr>
<th>Benefits of Committee Work</th>
<th>Library Size</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Small %</td>
<td>Medium %</td>
<td>Large %</td>
</tr>
<tr>
<td>Gain knowledge of other departments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very important</td>
<td>24</td>
<td>11.1</td>
<td>52.4</td>
<td>32.4</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>37</td>
<td>88.9</td>
<td>38.1</td>
<td>56.8</td>
</tr>
<tr>
<td>Not important</td>
<td>6</td>
<td>—</td>
<td>9.5</td>
<td>10.8</td>
</tr>
<tr>
<td>Total N</td>
<td>67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chance to influence library policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very important</td>
<td>29</td>
<td>77.8</td>
<td>45.0</td>
<td>36.1</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>32</td>
<td>22.2</td>
<td>45.0</td>
<td>58.3</td>
</tr>
<tr>
<td>Not important</td>
<td>4</td>
<td>—</td>
<td>10.0</td>
<td>5.6</td>
</tr>
<tr>
<td>Total N</td>
<td>65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chance to influence hiring decisions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very important</td>
<td>21</td>
<td>66.7</td>
<td>35.0</td>
<td>23.5</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>27</td>
<td>11.1</td>
<td>25.0</td>
<td>61.8</td>
</tr>
<tr>
<td>Not important</td>
<td>15</td>
<td>22.2</td>
<td>40.0</td>
<td>14.7</td>
</tr>
<tr>
<td>Total N</td>
<td>63</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning about the library's administrative policies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very important</td>
<td>23</td>
<td>22.2</td>
<td>28.6</td>
<td>41.7</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>28</td>
<td>22.2</td>
<td>57.1</td>
<td>38.9</td>
</tr>
<tr>
<td>Not important</td>
<td>15</td>
<td>55.6</td>
<td>14.3</td>
<td>19.4</td>
</tr>
<tr>
<td>Total N</td>
<td>63</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For gaining knowledge of other departments: $x^2 = 7.1946; df = 4; p = .1259$.

For chance to influence library policy: $x^2 = 5.8703; df = 4; p = .0688$.

For chance to influence hiring decisions: $x^2 = 3.8326; df = 4; p = .0078$.

For learning about library's administrative policies: $x^2 = 8.2704; df = 4; p = .0822$. 

...for recognizing their knowledge and abilities, and provide relief from routine job duties (table 10). For respondents with tenure requirements, it may be that publication activities and participation in professional associations outside the library are substituting or complementing the need for internal recognition in the library through committee service. Committee work may also be viewed by these respondents as an obligation added to publication and professional activities, and additional time away from primary job responsibilities.
TABLE 9
PERSONAL BENEFITS OF COMMITTEE WORK BY CURRENT POSITION

<table>
<thead>
<tr>
<th>Benefits of Committee Work</th>
<th>N</th>
<th>Line-level %</th>
<th>Supervisor %</th>
<th>Management %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chance to influence library policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very important</td>
<td>30</td>
<td>20.0</td>
<td>40.0</td>
<td>54.1</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>33</td>
<td>60.0</td>
<td>60.0</td>
<td>40.5</td>
</tr>
<tr>
<td>Not important</td>
<td>4</td>
<td>20.0</td>
<td>—</td>
<td>5.4</td>
</tr>
<tr>
<td>Total N</td>
<td>67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning about library operations within the department</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very important</td>
<td>12</td>
<td>12.5</td>
<td>30.0</td>
<td>14.7</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>20</td>
<td>87.5</td>
<td>20.0</td>
<td>26.5</td>
</tr>
<tr>
<td>Not important</td>
<td>30</td>
<td>—</td>
<td>50.0</td>
<td>58.8</td>
</tr>
<tr>
<td>Total N</td>
<td>62</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For chance to influence library policy: $x^2 = 7.9686; df = 4; p = .0927$

For learning about library operations within the department: $x^2 = 15.2447; df = 4; p = .0042$

TABLE 10
PERSONAL BENEFITS OF COMMITTEE WORK BY FACULTY STATUS

<table>
<thead>
<tr>
<th>Benefits of Committee Work</th>
<th>N</th>
<th>Without Faculty Status %</th>
<th>Faculty Status %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gain recognition for knowledge and abilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very important</td>
<td>15</td>
<td>40.9</td>
<td>14.3</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>24</td>
<td>36.4</td>
<td>38.1</td>
</tr>
<tr>
<td>Not important</td>
<td>25</td>
<td>22.7</td>
<td>47.6</td>
</tr>
<tr>
<td>Total N</td>
<td>64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide relief from routine job duties</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very important</td>
<td>5</td>
<td>8.7</td>
<td>7.0</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>15</td>
<td>39.1</td>
<td>14.0</td>
</tr>
<tr>
<td>Not important</td>
<td>46</td>
<td>52.2</td>
<td>79.1</td>
</tr>
<tr>
<td>Total N</td>
<td>66</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For gaining recognition: $x^2 = 6.6678; df = 2; p = .0552$

For providing relief from routine job duties: $x^2 = 5.7930; df = 2; p = .0552$

an avenue for learning. The type of learning provided by committee work varies in importance by category of library and the dimensions of our respondents' positions. Yet almost all of the librarians in our sample indicated that their committee work provides an important opportunity for broadening their knowledge of internal and/or external library operations.

BENEFITS TO THE ORGANIZATION

Participative practices will remain viable only as long as they are viewed as beneficial to organizational performance and job satisfaction by a wide cross section of employees. As identified by Seashore, "commonly accepted features" of participative organizations include:

- A high level of communication among employees of all ranks
- The ability for employees of all ranks to influence the goals of the organization
- A high level of interaction among employees
- A high level of mutual confidence and trust among employees.
TABLE 11
ATTITUDES OF LIBRARIANS TOWARD COMMITTEE FUNCTIONS

<table>
<thead>
<tr>
<th>+/-</th>
<th>Committee Function</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>(+)</td>
<td>Committees promote creativity through the exchange of ideas.</td>
<td>59</td>
<td>89.4</td>
</tr>
<tr>
<td>(+)</td>
<td>Committees promote coordination among departments.</td>
<td>59</td>
<td>86.8</td>
</tr>
<tr>
<td>(-)</td>
<td>Most decisions reached by committees are compromises rather than best decisions.</td>
<td>30</td>
<td>45.5</td>
</tr>
<tr>
<td>(+)</td>
<td>Committees promote communication between departments.</td>
<td>62</td>
<td>91.2</td>
</tr>
<tr>
<td>(-)</td>
<td>Committees breed conformity and stifle creativity.</td>
<td>15</td>
<td>24.2</td>
</tr>
<tr>
<td>(+)</td>
<td>Most professionals in my library have an equal chance of serving on committees.</td>
<td>40</td>
<td>58.0</td>
</tr>
<tr>
<td>(+)</td>
<td>Committees help libraries function efficiently.</td>
<td>42</td>
<td>68.9</td>
</tr>
<tr>
<td>(+)</td>
<td>Serving on committees helps me perform my job better.</td>
<td>34</td>
<td>55.7</td>
</tr>
<tr>
<td>(+)</td>
<td>Committees promote communication between employees of different ranks.</td>
<td>49</td>
<td>73.1</td>
</tr>
<tr>
<td>(-)</td>
<td>Committee work often requires knowledge and experience outside my expertise.</td>
<td>25</td>
<td>37.3</td>
</tr>
<tr>
<td>(-)</td>
<td>I often feel uncomfortable contributing my ideas in committee meetings.</td>
<td>12</td>
<td>17.9</td>
</tr>
<tr>
<td>(-)</td>
<td>While they may be useful, committees waste too much time.</td>
<td>33</td>
<td>50.8</td>
</tr>
<tr>
<td>(-)</td>
<td>The main role of a committee should be to exchange ideas and information.</td>
<td>19</td>
<td>31.1</td>
</tr>
<tr>
<td>(-)</td>
<td>A committee should be able to recommend, but never to decide.</td>
<td>21</td>
<td>31.8</td>
</tr>
<tr>
<td>(+)</td>
<td>Committees should be used to establish library policies.</td>
<td>31</td>
<td>50.0</td>
</tr>
<tr>
<td>(+)</td>
<td>Committees should be used to implement library policies.</td>
<td>34</td>
<td>54.0</td>
</tr>
<tr>
<td>(-)</td>
<td>I dislike being held responsible for committee decisions.</td>
<td>18</td>
<td>31.6</td>
</tr>
<tr>
<td>(-)</td>
<td>I resent the time that committee work takes from my primary duties.</td>
<td>26</td>
<td>42.6</td>
</tr>
<tr>
<td>(-)</td>
<td>Management is over-represented on the committees in my library.</td>
<td>18</td>
<td>27.7</td>
</tr>
<tr>
<td>(+)</td>
<td>The committee is the best way to assure informed decisions.</td>
<td>34</td>
<td>61.8</td>
</tr>
</tbody>
</table>

Percentages are based on the number of valid responses received.

In our survey, we attempted to assess the contribution of committee work to these features. We also reasoned that to be considered a viable component of participative practices, employees must have confidence in the ability of committees to have a significant impact on their organization. Measures of this impact have been incorporated into this section of the analysis. Our respondents' perceptions of the influence of committee work in their libraries were measured through a twenty-item Likert-type scale (table 11). The scale is composed of an equal number of positive and negative items. Respondents were asked to indicate their level of agreement with each scale item, using the following categories: strongly agree, agree, disagree, strongly disagree. Table 11 shows the percentage of combined responses in the "strongly agree" and "agree" categories. The direction of the statement (positive, negative) is indicated at the beginning of each scale item.

As discussed, interaction and communication are viewed as important features of participative organizations. The literature on organizations emphasizes the importance of the committee as a mechanism for coordinating the diverse activities performed by individuals and
separate administrative units within organizations. The importance of this role for committees in academic libraries is supported by our analysis. Over 90 percent of the respondents agreed with the statement, “Committees promote communication between departments.” Other statements receiving a high, positive response rate are “Committees promote creativity through the exchange of ideas” (89 percent) and “Committees promote coordination among departments” (nearly 87 percent). Our respondents were somewhat less likely to view committee service as a way to promote communication between employees of different ranks (73 percent). Although these positive aspects of committees were recognized, a number of our respondents expressed a lack of confidence in the ability of committees to contribute to the overall efficiency of their libraries. Only about two-thirds (almost 69 percent) of the librarians responded positively to “Committees help libraries function efficiently.”

An overview of our results also shows a lack of confidence in the decision-making ability of committees. Close to half (45.5 percent) of our sample agreed with the statement, “Most decisions reached by committees are compromises rather than best decisions” and about one-fourth (24 percent) of our respondents believe that committees breed conformity and stifle creativity. About one-third (almost 32 percent) of the librarians in our sample report that they dislike being held responsible for committee decisions. When asked to provide an overall assessment of the ability of committees to provide organizations with sound decisions, slightly under two-thirds (nearly 62 percent) of the sample responded positively to the statement, “The committee is the best way to assure informed decisions.”

As discussed, the amount of time consumed by committee meetings and related work is often cited as one of the more negative aspects of committee service. Our analysis indicates that a significant number of our respondents would agree with this complaint. Slightly over half (about 51 percent) of our respondents agreed with the statement, “While they may be useful, committees waste too much time,” and about 43 percent indicated that they resent the time committee work takes from primary job duties. The only significant relationship between library size and any of the scale items was obtained for the global measure of the committee’s contribution to the effectiveness of the library. All of the librarians in the “small” library category agree that committees “help libraries function efficiently”; only about 64 percent of those in medium and large libraries agree with this statement. This finding may be explained by the different roles that committees play in libraries of various sizes. As discussed, establishing and implementing policy seems to be a fairly routine function of committees in small libraries. This function is much less likely to be assumed by committees in larger libraries. Serving on committees that have a significant impact on the organization seems to be reflected in the perception that libraries are functioning effectively because of committee input.

**FAVORABILITY INDEX**

Summing across the scale items in table 11 and dividing by the number of valid responses for each individual in our sample provides us with an index of favorable/unfavorable attitudes toward committees. By this method, it is possible for respondents to have scale values ranging between 1 and 4. An index value of 1 would indicate that respondents expressed an unfavorable attitude toward all scale items in table 11, while an index value of 4 would result from unanimously favorable responses to all scale items. The index values of our respondents ranged from a low of 1.89 to a high of 3.84, with an average score of 2.759.

The higher the position rank of our respondents, the more likely they were to express a favorable attitude toward committees (table 12). Only about 20 percent of all line-level employees had highly positive index scores, as compared to 45.5 percent of supervisors, and 62.5 percent of managers. This finding
TABLE 12
FAVORABILITY TOWARD COMMITTEES BY CURRENT POSITION

<table>
<thead>
<tr>
<th>Favorability Index</th>
<th>N</th>
<th>Line-level %</th>
<th>Supervisory %</th>
<th>Management %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>35</td>
<td>80.0</td>
<td>54.5</td>
<td>37.5</td>
</tr>
<tr>
<td>High</td>
<td>35</td>
<td>20.0</td>
<td>45.5</td>
<td>62.5</td>
</tr>
<tr>
<td>Total N</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$x^2 = 5.4818; df = 3; p = .0287.$

TABLE 13
FAVORABILITY TOWARD COMMITTEES BY LIBRARY SIZE

<table>
<thead>
<tr>
<th>Favorability Index</th>
<th>N</th>
<th>Small %</th>
<th>Medium %</th>
<th>Large %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>35</td>
<td>30.0</td>
<td>40.9</td>
<td>62.2</td>
</tr>
<tr>
<td>High</td>
<td>35</td>
<td>70.0</td>
<td>59.1</td>
<td>37.8</td>
</tr>
<tr>
<td>Total N</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$x^2 = 4.5029; df = 2; p = .03716$

TABLE 14
FAVORABILITY TOWARD COMMITTEES BY HOW OFTEN COMMITTEE RECOMMENDATIONS ARE IMPLEMENTED

<table>
<thead>
<tr>
<th>Favorability Index</th>
<th>N</th>
<th>Rarely %</th>
<th>Sometimes %</th>
<th>Often %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>33</td>
<td>66.7</td>
<td>56.8</td>
<td>34.8</td>
</tr>
<tr>
<td>High</td>
<td>33</td>
<td>33.3</td>
<td>43.2</td>
<td>65.2</td>
</tr>
<tr>
<td>Total N</td>
<td>66</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$x^2 = 3.472; df = 2; p = .0715.$

did not support our expectations. Since committees are supposed to provide opportunities for rank-and-file employees to have a voice in their organization, we expected line-level employees to express a much more positive attitude toward committee work than other employees. It may be that managers tend to focus on the use of committee work, while the perspective of line-level people is on process, and that these different views are contributing to the direction of this relationship. Perhaps line-level personnel have a more limited view than supervisors and managers of the benefits of committee work to the larger organization, and are more likely to focus on the time commitment and other disadvantages of the actual dynamics of committee work.

Those in large and medium-sized libraries express a less favorable attitude toward committees than those in small libraries (table 13). Small libraries are much more likely than larger libraries to use committees for policy-related tasks, and having this input seems to lead to a more positive attitude toward committee service.

Respondents who report that committee recommendations are often implemented in their libraries are much more positive about committee work than those who report that recommendations are rarely or sometimes implemented (table 14). Again, this supports the idea that librarians who see that their committee service has a significant impact on their organization will be positive about this aspect of their work.

CONCLUSIONS

One of the major features that distinguishes participative organizations from others is the provision of opportunities for communication, interaction, and influence across functional and status lines. This study shows that committees
in academic libraries are providing this opportunity through involving librarians from a variety of ranks and service areas in the decision-making processes of their libraries. These committees are providing opportunities for a wide cross section of librarians to communicate and learn about the jobs of others in their libraries, and administrative policies and procedures. While the communication and learning functions of committees are important, the basic tenet of participative management is to provide rank-and-file employees with the authority to shape the goals and structure of their host organization, and our study indicates that some libraries are using committees in this role to a greater extent than others. Some libraries are using committees primarily for fact-finding and information-gathering, while reserving the authority for policy decisions for administrative personnel.

Our study shows that the larger the library, the more likely it is that committees will be used solely for these functions. Librarians who serve on fact-finding and information gathering committees tend to have a less positive attitude than others about their committee service. While they express dissatisfaction with the limited impact of committees, they are cautious about the use of committees in more significant roles. This caution is not a management-dominated attitude, but is expressed across all position ranks. Our study shows that the majority of committee work carrying policy implications is conducted in smaller libraries, although this function is found in libraries of all sizes. Librarians who serve on committees with the authority to establish and implement policy believe in this role for committees, and are positive about the ability of committees to benefit the organization.

REFERENCES AND NOTES

2. Ibid., 317.
9. Ibid., 272.
11. The random sample of 125 academic librarians was drawn from the 1993/94 ALA Handbook of Organization and Membership Directory (Chicago: ALA). Three of the potential respondents were dropped from the sample because of insufficient location information.
12. All analyses were done using SPSSX. Nominal and ordinal data were analyzed using chi-square tests. Some interval level data were collapsed into logical categories and analyzed through chi-square tests. All reported p's for chi-square reflect Yates' correction.
14. Developed on the basis of categories in ARL SPEC kits.
16. Summaries of a number of these studies are found in: Fred M. Peterson, “The Use of Committees in the Governance, Management, and Operations of Three Major University Libraries” (Ph.D. diss. Indiana University, 1977). See also: Bonnie Horenstein, “Job Satisfac-


20. Many of the scale items were derived from research reported in Peterson, "The Use of Committees," 375–93; and Rollie Tillman Jr., "Committees on Trial," 6–12. Other items were developed specifically for this study.


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The Strength of Weak Ties in Electronic Development of the Scholarly Communication System

Charles A. Schwartz

How would knowledgeable use of the Internet develop within academic institutions or various research fields and then diffuse across the loosely coupled scholarly communication system? Conversely, how might the scholarly system become balkanized into autonomous, even antagonistic, cultures or camps based on differing technological competencies and interests? Three overlapping models of innovation (new technology) diffusion are described in relation to the Internet: individual threshold, critical mass, and the strength of weak ties. Two contrasting scenarios of a balkanized system are drawn: separate tables and braking mechanisms. The analysis discusses the prospective role of academic librarians in electronic development of the scholarly system and concludes with a note on future research in this area.

Little is known, in any systematic way, about the impact of the Internet on patterns of scholarly communication. While the effects of computer networking in the workplace have received some attention over the past decade, empirical research on the role of the Internet in the scholarly communication system hardly has begun. The literature in this area generally is marred not only by a lack of analysis but also by certain problems which have deterred understanding. These include an ambiguity of Internet effects and incommensurable differences between the print and electronic forms of communication.

An ambiguity of Internet effects—functions (advantages) being inseparable from dysfunctions (disadvantages)—is readily apparent to anyone who has joined a few electronic groups:

To inhibit the flow of “useless junk” is to risk the loss of one of the most valuable impacts of computer-mediated communication systems—the flow of potentially useful information and ideas among persons with no previous or off-line communication links. Bound up with that dilemma is a law of diminishing returns: the more information accessed, the less its overall meaning.

In the midst of such ambiguity, two sharply divided schools of thought have emerged. Enthusiasts extol the revolutionary potential of the Internet to transmit interactive communication around the world at a rate close to the speed of thought. More conservative analysts, however, emphasize the limited experience of most scholars in using the Internet. In that behavioral perspective, the “key issue in technological

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innovation lies not within technology itself but among its potential users—whether they possess a clear vision of opportunities that permit wise choices about what to pursue and what to prevent. 3

On a more fundamental plane, the two schools have come to reflect incommensurable paradigms whose bases include everything from computer experience and scholarly tradition to time, space, and reality. Communication across that great divide is inevitably partial, for sustained and knowledgeable use of the Internet is a matter of personal conversion rather than simple logic:

The computer’s allure is more than utilitarian or aesthetic; it is erotic. Instead of a refreshing play with surfaces, as with toys or amusements, our affair with information machines announces a symbiotic relationship and ultimately a mental marriage to technology. 4

Consider, for example, the two schools’ split assumptions about human adjustment to technological innovation. Conservatives contend that “people are not easily sold on anything [like the Internet] that promises change in cognitive processes and organizational social structure.” 5 Enthusiasts take a different tack, that “as we’ve learned from the history of the telephone, radio, and television, people can adopt new communication media and redesign their way of life with surprising rapidity.” 6

Or, consider mental models of the place of virtual reality. Where pioneers behold a “post-Gutenberg galaxy,” other scholars discern an “infinite cage” in which the computer’s faceless language and protocols threaten to govern the very processes of thought. 7 Overall, it is not surprising that several writers have come to the view that few other areas of modern social science have such a large number of unsubstantiated speculations and such a small number of serious studies. 8

A new field can be advanced if researchers agree on a framework of significant and feasible issues. Toward that end, this article suggests two allied issues: (1) the impact of the Internet on the structure of the scholarly communication system, and (2) the prospective role of academic librarians in that process.

The scholarly system has a loosely coupled structure, one with remarkably little interaction, coordination, or even direct cause-and-effect relationships among the main constituencies: universities, academic libraries, computing centers, publishing houses, the scholars themselves, and their societies. An essential issue is whether the Internet tends to make the system generally more tightly coupled (interdependent) or loosely coupled (organized anarchy).

The allied issue is which group(s) will take a leading role in the dual process underlying new technology diffusion in the scholarly system: on a micro level, to mentor adoption and knowledgeable use of the technology; and on a macro level, to make the connections across groups—the strength of weak ties—on which system-wide diffusion of innovation depends.

An essential issue is whether the Internet tends to make the system generally more tightly coupled (interdependent) or loosely coupled (organized anarchy).

The thesis is that academic librarians are strategically situated to be the main agents of electronic development of the scholarly communication system. In that role, they can help prevent academic institutions and other parts of the system from becoming unnecessarily divided into separate cultures or camps based on differing technological competencies and interests.

The analysis focuses on informal patterns of online scholarly communication. It does not cover the tangle of rudimentary issues involving development of peer-reviewed electronic journals. That latter, more futuristic, topic is treated in the author’s earlier work on scholarly communication as a loosely coupled system. 9

The article is arranged in four parts. The first describes scenarios of a balkanized system. The second part outlines a
set of models of innovation (new technology) diffusion that would lead to a more tightly coupled system. The next part focuses on the prospective role of academic librarians as the strength of weak ties in the loosely coupled system. The last part is a note on future research in this area.

**SCENARIES OF A BALKANIZED SYSTEM**

If history is any guide, there is a real prospect of academic institutions or research fields breaking into autonomous, even antagonistic, cultures or camps based on differing technological competencies and interests. The scenarios described below are not bound to become dominant but doubtless will be evident.

**Separate Tables**

In the 1960s computer statistical packages associated with the behavioral movement caused tremendous divisiveness in academic departments and scholarly societies. The result, described decades later by Gabriel Almond, is that "in some sense the various schools and sects now sit at separate tables, each with its own conception of proper science, but each protecting some secret island of vulnerability." Almond took his metaphor from *Separate Tables*, a 1955 play in which solitary diners in a hotel convey the loneliness of the human condition. Tables are a popular metaphor; scholars in the humanities complain that they do not have a "place at the table," that they are "starving at the banquet." In this scenario, some functions of Internet groups—their international scope, nearly instantaneous interactive dynamic, and social equality—could generate a resurgence of chauvinistic conflicts over competing research agendas, theories, and methods. Even Howard Rheingold, a dean of Internet pioneers, recognizes this prospect:

The willingness of the online population to tolerate wide diversity of opinion might be . . . an artifact of the early stages of the medium's growth. Fragmentation, hierarchization, rigidifying social boundaries, and single-niche colonies of people who share intolerances could become prevalent in the future.14

Separatism could take the broader form of a counter ethos to the Internet as a symbol of intelligence and modernity if numbers of scholars become appalled by computer jargon, electronic junk, and the semblance of "systems people" to a new-age "priesthood." A counter ethos might also develop in reaction to a failure of some hypertext systems to meet scholarly needs.15

**Braking Mechanisms**

An analogy drawn from the transformation of the former Soviet system highlights the sheer difficulty of cultural and behavioral change in any large-scale social system. Stevan Harnad coined the term *intellectual perestroika* to signify a restructuring of the pursuit of knowledge in the electronic era. Other writers describe such fundamental change in a similar fashion:

Adoption [of the Internet] has entailed a rather difficult process of unscrambling old procedures and attitudes, moving to new ways of performing intellectual tasks and of thinking about communications, and then installing the new processes into the daily agenda of individuals and groups.17

Back in the U.S.S.R., when the Soviet form of perestroika began to deteriorate in the late 1980s, Mikhail Gorbachev complained that traditional institutions and ways of thinking were operating as "braking mechanisms" on the reform movement.18

In the West, certain properties of either the Internet or the traditional scholarly system thus far have operated as braking mechanisms on electronic progress. These include perceptions of cognitive overload and information overload, lack of identifiable productivity gains, and lack of academic rewards for scholars to use the Internet.

**Cognitive Overload.** The Internet is often likened to the ancient Library of Alexandria, which had a world of
information but little in the way of a card catalog. As conservatives point out, navigating the Internet involves fundamentally new skills. Though not "rocket science," such skills do require a commitment to learn and pose continuing frustrations over inconsistent protocols, redundant or incomplete search-engine retrievals, incompatible text formats, and so forth. While such frustrations continually are being alleviated by technical refinements, the problem of cognitive overload should be seen in a broad context. The architectural scheme of the Internet remains that of ARPANET, the first computer network designed in the 1960s as a "doomsday" device—a communications and command medium that could survive a nuclear war by virtue of having no central control on either a policy or a technical level.

Enthusiasts, for their part, are not really concerned about technical difficulties: "We are early adopters of a chaotic technology, and the momentum of our own enthusiasm generally carries us beyond the many annoyances and impediments that stand in the way of an easy, natural, information retrieval environment." Indeed, some librarians make a game out of difficult search and retrieval in the form of Internet "treasure hunts," a behavior that anthropologists would term "galumphing"—the voluntary placing of obstacles or complications in one's path because the center of interest is process rather than goal.

Information Overload. The Internet expedites a host of traditional scholarly needs: current awareness of professional developments, exchange of information on a timely basis, and collaboration among distant colleagues. A new function is the creation of online journals that are "laboratories rather than showcases," enabling a shift in scholarly communication from a finished product to the process of developing "knowledge in conversation." Enthusiasts make the claim that, "once we're all connected," the Internet will be a liberating, edifying experience of global proportions. Some collection development policies for the Internet even call for libraries to maintain archives of electronic groups (not just journals) as part of the "scholarly record."

Conservative analysts, however, have a darker vision of the Internet being filled with "unmitigated garbage: off-the-cuff ideas, rabid diatribes, ideological vendettas—topics and recreations that have little relevance to any commercial, scientific, or serious activity." Science fiction writers of the cyberpunk genre address this problem in different moods. Some writers depict a new profession of knowledge mediators called hackers. In the next century, there are so many computer sites, networks, and databases that accessing the Internet, in one novelist's delightful hyperbole, has become equivalent (in paper format) to "arranging for a 747 cargo freighter filled with telephone books and encyclopedias to power-dive into one's unit every couple of minutes, forever."

Other writers discount the role of knowledge mediators (whether hackers or librarians) to manage information overload. In a novel set in the year 2038, the Internet has become a "rowdy babel, a torrent of confusion and comment, made worse because in order to be noticed each user sends out countless copies of his messages to any node that might conceivably listen." A courtesy monitor warns people not to "act like mental patients who shout out anything that comes to mind."

The contemporary impact of the Internet on scholarly communication probably varies with each of the 1,200 or so discussion groups, as well as with individual competencies and interests. Still, the thrust of the Internet is hardly scholarly. As Charles McClure and associates found in a series of surveys, scholars have a clear aversion to online journals because "electronic publication does not enhance one's status or image; in fact, it may very well harm them." The few successful attempts at establishing scholarly (indexed) online journals have relied on a strategy of putting famous researchers on editorial boards and having them twist the arms of colleagues to submit papers.
The thrust of the Internet is the social-ability of networking. Indeed, a unique feature of this fiercely egalitarian medium is its diminished social-status effects: “People who regard themselves as physically unattractive report feeling more lively and confident when they express themselves over the network. Others who have soft voices or small stature report that they no longer have to struggle to be taken seriously.”28 The New Yorker captured this feature in a cartoon of a dog sitting at a computer terminal explaining to a puppy, “On the Internet, nobody knows you’re a dog.”29

We simply do not know whether the Internet will lead (at least in our lifetimes) to a grand, across-the-board renegotiation of historical print-age patterns of influence and interaction.

By and large, people grapple with information overload (or simplify choice situations) by reducing environmental scanning; narrowing attention spans; and devising other rule-of-thumb strategies. For e-mail in particular, information overload tends to have a curvilinear pattern. Individuals with an intermediate range of experience—about 20–50 online hours—are most susceptible to overload.30 With greater experience, individuals tend to withdraw from some groups and develop better networking skills. The essential point is that, as functions slide into dysfunctions, optimal computer networking requires some exposure to information overload.

Productivity Gains versus Opportunity Costs. To consider the prospective impact of the Internet, a two-level perspective is helpful. Technology can have first-level efficiency effects and second-level social effects. First-level effects involve the use of new technology to do old things in better or faster ways. Second-level effects lead people to do new things, to pay attention to different things, to interact with one another differently, or to develop new needs or expectations. Second-level effects are extraordinarily difficult to predict and emerge in society rather slowly, as people renegotiate outworn patterns of influence and interaction.31

The literature on the Internet contains a few reports of first-level effects. For example, an online version of the Mendelian Inheritance in Man database, to which geneticists can post electronically a research note to a particular entry, is one way that networking can make a previously established form of scholarly communication more efficient.32 What is absent from the literature, however, is evidence of second-level effects of networking on scholarly communication as a social system. We simply do not know whether the Internet will lead (at least in our lifetimes) to a grand, across-the-board renegotiation of historical print-age patterns of influence and interaction.

Productivity gains from Internet activity are especially hard to specify. Even people with a lot of online experience tend to have only an intuitive grasp of its effect on their work. As the McClure team found in surveys, “members of groups have difficulty articulating specific network impacts [even though] they cannot imagine working without networks.”33 Common responses to other surveys on the Internet’s social effects are likewise abstract: “increasing the stock of ideas” and “exchanging opinions.”34 Enthusiasts rightly contend that arguments about our inability to specify second-level effects of the Internet are too abstract to be really persuasive. Networking’s power to transform and multiply the relativity of human interaction is plain enough. Still, the computer-productivity paradox and the distinction between efficiency and social effects remain interesting areas for research.

MODELS OF INNOVATION DIFFUSION LEADING TO TIGHTER COUPLING

Up to now, this article has considered prospects for electronic development of the scholarly communication system at the level of an individual scholar or librarian who must balance,
by experience or intuition, the benefits of learning how to navigate the Internet against the opportunity costs to other, more established professional concerns. As the McClure team found in surveys, scholars seeking access to the Internet typically have only one piece of research in mind and do not want to take a computer course or even deal with "systems people" to learn how to get the information. Instead, they need a personal consultant who understands their project well enough to offer application-specific training and "one-on-one hand-holding." Other observers have drawn a similar conclusion—that academic librarians may find a unique niche as knowledge mediators who combine technical and disciplinary skills to meet specialized research needs.

Another two-level perspective is helpful. The foregoing analysis is a microlevel, somewhat static view of the scholar’s teachable moment, when a particular need for the Internet arises. On a macrolevel, what are the conditions under which scholars’ knowledgeable use of the Internet would be dynamic, spreading within academic institutions or across various research groups, then becoming a self-sustaining process in the system as a whole? In other words, how do individual decisions to adopt the Internet (or any innovation) possibly interact and aggregate in a loosely coupled system?

Three overlapping models of collective behavior address these questions at a systems level: individual threshold, critical mass, and the strength of weak ties. Although these models are not predictive (they can be "proven" only after they occur), they have attracted wide attention as conceptual schemes that integrate microlevel individual preferences with macrolevel patterns of innovation diffusion.

**Threshold Model**

This model applies to a situation in which an individual has two alternatives: to do or not do a certain thing. The "thing" can be any binary decision in which one’s choice depends, in part, on the choices of some relevant group of individuals in the preceding period. Such decisions involve adopting—or rejecting—an innovation, engaging in a political activity (striking, voting, or rioting), migrating, or conforming in various ways. The concept of threshold refers to the number or proportion of others who must make a choice before a given individual comes under the influence of "bandwagon effects."

As an illustration, individual preferences regarding the Internet can be imagined on a 100-point scale. Pioneers have low thresholds (barriers to innovation); indeed, people like Charles Bailey Jr., Elaine Brennan, Diane Kovacs, or Stevan Harnad who start electronic journals when almost everyone else is doing nothing of the sort have a threshold around zero. Edward Jennings, reflecting on the founding of EJournal, said that "given the efficiencies of the medium we were celebrating so noisily, it seemed to have taken us a ridiculously long time just to find a few people willing to listen seriously to our ideas."

At the other end of the scale, conservatives—whether from fear, indifference, or lack of a mentor—have high thresholds. Actually, this model does not apply where most thresholds are very low or very high—that is, where an individual’s behavior is not contingent on that of others. Thresholds in the middle range are the relevant ones in making the conceptual link between individual preferences and aggregate outcomes.

**Critical Mass**

This pertains to the turning point when an innovation is adopted—or rejected—by enough individuals to induce many others to do the same. The critical ("take off") stage of Internet adoption started in 1987 when extremely rapid advances in superconducting research pointed up the inadequacy of preprints and telephones for scholarly communication; clusters of researchers adopting technology more or less simultaneously are a familiar phenomenon. However, the literature on computer networking draws a
bleakly different scenario in which sustained use of the Internet spreads for a while, then recedes, leaving academic institutions and research fields divided into separate camps. In face of that prospect, discussions on upgrading the Internet to a national information infrastructure have included the need for equity policies which would serve to universalize access to networking information and services.

The Strength of Weak Ties

This model describes how an innovation can spread from group to group in a loosely coupled system. As opposed to bandwagon effects at the group level, the strength of weak ties focuses on the role that outsiders play in the diffusion process at the systems level. An indirect but striking example—pertaining to information diffusion rather than technical knowledge diffusion—comes from experiments on the French national network that uncovered the role of "cross-pollinators of télématique":

As the [French] system evolved, it became a very loosely coupled collection of different information services and communication forums. Many people stayed in only one or two different domains, but a small number of people seemed to move ideas very swiftly from one group to another. We found that we could feed a small piece of deliberately false information to one of these people, and it spread throughout all the different groups, to as many as four thousand people within two days.

In a nutshell, outsiders are those individuals who are most likely to deal with acquaintances in other groups (specialties, organizations, or other branches of the same organization).

Scholarly innovations tend to come from interdisciplinary patterns of interaction at the margins of established fields. If the innovativeness of a research (or social) group is shackled by vested intellectual (or cultural) interests, then new ideas must emanate from outsiders in the network of individuals. Weak ties thus provide the basis for both microlevel change (by broadening group horizons) and macrolevel integration (by expanding intergroup connections).

What types of individuals are potential agents of Internet use in the scholarly communication system? Generally, it would be those who have ties that overlap generational, occupational, or knowledge groups: "Gaps in network attitudes and skills exist along several dimensions: between older and younger researchers, between researchers and network administrators, between people in different sectors, between researchers from different disciplines, and between researchers working on different kinds or different stages of problems." Success for a scholar as an Internet pioneer can be problematic. On the one hand, "some junior researchers fear that their network expertise would relegate them to a 'computer ghetto,' in which they no longer participate in the conceptual aspects of research." On the other, as the protagonist in a cyberpunk novel reflects when exploring an outdoor music and technology fair: "Interesting things happen along borders—transitions—not in the middle where everything is the same. There may be some-thing happening along the border of the crowd, back where the lights fade into the shade of the overpass."

PROSPECTIVE ROLE OF ACADEMIC LIBRARIANS

In considering the prospect of the scholarly communication system becoming balkanized into separate cultures or camps, one must weigh the opportunity costs of learning to use the Internet against other professional concerns. A vast majority of scholars may simply go along with what tenure committees recognize—teaching and publishing as usual—and avoid what they perceive to be a technological hassle. Certainly, there is no shortage of warnings by conservatives against "mindless safaris into galaxies of informational garbage."

The idea that the library should assume a leading role on campus in developing positive faculty attitudes about
the use of new technology is hardly a new one. My point concerns a broader, more systematic, even historic process. Academic librarians, by facilitating knowledgeable Internet activity—teaching short courses; publishing descriptive accounts in scholarly journals; and making alliances, under the auspices of the Association of College and Research Libraries, with scholarly societies—can provide the strength of weak ties on which systemwide adoption and integration of the new technology rests.

Field Variances in the "Strength of Weak Ties" Model

The importance of this prospective role will vary, as will patterns of Internet adoption, with the nature or structure of collegial interaction within a particular field. Such interaction differs markedly among fields. In science and technology fields, work tends to be highly collaborative within a department because colleagues have a common environment—they share the same technology and much professional knowledge. Thus, one would expect departmental ties to be the primary social influence for scientists to adopt the Internet. Such close influence can be called the "classical Athens interface."50

The social sciences and humanities, by contrast, have much less opportunity for collaboration within a department, partly because faculty hiring is geared to maximizing intellectual diversity as a means of ensuring broad instructional coverage. In that kind of setting, given the lack of shared technology and expertise on campus, collegial support tends to be on a regional or national "invisible college" level.51

Survey Research on Field Variances

Internet surveys conducted by the writer in 1993, while not having a rigorous level of statistical reliability (in the 90 percent range of confidence that responses are not merely random), are nonetheless broadly supportive of these alternate theories. For respondents of CIVIL-L (Civil Engineering Research and Education), one-third were prompted to adopt the Internet by departmental colleagues and another third by more distant contacts (librarians, computer specialists, or "invisible college" acquaintances); the last third were self-starters. In contrast, 80 percent of respondents of HUMANIST (Humanities Computing) were prompted by distant social influences to adopt the Internet and another 10 percent by departmental influences; the remaining 10 percent were self-starters.

The problem of high statistical reliability is that Internet surveys tend to have very low response rates, 5 percent or less.52 The two surveys described here had rates of about 20 percent (n=30), but that rate was accomplished by asking only one question and by sending it personally addressed to individuals instead of posting it, bulletin-board style, on a listserv.

Low response rates are indicative of task-centered groups, which are characterized by strong individualism, low social cohesion, mobility of membership, and relatively narrow goals. Such groups, especially online, are well suited to enhance the information-gathering functions of relationship-centered groups, which have broad mandates, stable memberships, and holistic personal relationships.53 Yet, the relatively narrow purview of online scholarly groups—with their low response rates to Internet surveys—is an important qualifier to the idea of "virtual communities."

FUTURE RESEARCH

At a broad, systems-level analysis, the Internet will tend to balkanize the scholarly communication system into separate camps or cultures based on differing technological competencies and interests. Of great interest, however, will be all the exceptions to that generalization. The force of some braking mechanisms—cognitive overload and information overload—will depend in part on the structure of collegial interaction within a particular field. The force of other braking mechanisms—lack of clear productivity gains or academic rewards—might lessen, over time, if computer networking becomes a
very symbol of intelligence and modernity. Simply put, the Internet will affect the various fields in diverse ways and at different rates.

Comparative case studies will reveal a central paradox of our time, that the scholarly communication system is becoming simultaneously more unified (tightly coupled) and more fragmented (loosely coupled). A rudimentary hypothesis is that the growth of electronic journals and groups in centralized fields will have *decentralizing* effects, whereas such growth in decentralized fields will have *centralizing* effects.

Another area for comparative case study involves patterns of social influence in new technology adoption and diffusion. The strength of weak ties model proposed here is different from the conventional model of "integrated" librarianship. In the latter model, which evolved in the 1970s, subject specialists staff the reference desk and serve all comers, including those with simple information needs. While that model had fallen into "conceptual disarray" (Jerry Campbell's phrase) by the late 1980s, the Internet should accelerate its demise.

Just as scholars face opportunity costs (e.g., to research productivity) in learning how to navigate the Internet, academic librarians must be relieved of labor-intensive tasks if they are to have a more sophisticated involvement with the new technology, particularly that on UNIX-based systems. This is an important shift, one that warrants analysis and understanding, for it has aroused a strong debate that reflects the emergence of antagonistic cultures or camps within our own profession.

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**REFERENCES AND NOTES**


15. One example involves *Thesaurus Linguae Graecae*, a computer disk containing nearly all classical Greek texts (some 62 million words). It has not had much of an impact on scholarship because many so-called "imported concepts" that are useful for understanding classical Greek society—e.g., sovereignty, state, ideology, citizenship—are not part in the ancient Greek language. W. R. Connor, "Scholarship and Technology in Classical Studies," in *Scholarship and Technology in the Humanities*, ed. May Katzen (New York: Bowker Saur, 1991), 58–60. In a similar vein, Oleg Grabar shows how poorly designed computer products can result when technicians who design them do not understand certain field-specific subtleties. Oleg Grabar, "The Intellectual Implications of Electronic Information," *Technology, Scholarship, and the Humanities: The Implications of Electronic Information* [see reference 3] Get GRABAR.WP.


17. R. William Maule, "Infrastructure Issues in Computer-Mediated Communication," *Electronic Journal of Communication* 3, no. 2 (1993): 2. E-mail retrieval: Conserve@vm.its.rpi.edu; Send MAULE V3N293.


26. McClure, NREN, 103.


28. Lee Sproull and Sara Kiesler, "Computers, Networks, and Work," *Scientific American* 266 (Sept. 1991): 120. Counterpoint to this fierce egalitarianism is the need for the scholarly system to develop new norms of communication: "We are still a community that is learning how to talk to itself, a community that is learning how to describe itself, and a community that is trying to learn the standards that will allow us to talk to one another without friction or noise." Elaine Brennan, "Informal Publication and the Scholarly Record: Bits and Bytes from the Experience of Editing HUMANIST and Other Electronic Lists," in *Scholarly Communication in an Electronic Environment*, ed. Robert Sidney Martin (Chicago: ALA, 1993), 44.


35. McClure, NREN, 156.


44. Rheingold, *Virtual Community*, 228.


46. McClure, NREN, 156.

47. Ibid.
Evolution of Affective Career Outcomes: A Field Study of Academic Librarians

Joyce S. Phillips, Kerry D. Carson, and Paula P. Carson

One hundred nine master-level librarians of varying ages were surveyed about their career attitudes. Hierarchical polynomial regression was then employed to examine the relationships between age and three affective outcomes: (1) career satisfaction, (2) career entrapment, and (3) career identity. Results indicated the age-satisfaction relationship was linear, demonstrating that librarians become increasingly pleased with their profession over time. A similar linear relationship between age and entrapment indicated that as librarians mature, they become bound to their line of work because of accumulated investments and decreased career options. The relationship between age and identity assumed a curvilinear, or inverted U-shaped form. Career identity was higher at mid-career and lower at both early and late career stages. Implications of these findings are advanced.

When trained individuals accept positions in libraries, they do more than gain employment—they embark upon their careers. How they manage their careers not only affects their personal well-being but also influences organizational effectiveness. Yet the process of career progression virtually has been ignored in librarianship literature. Such a lack of research is surprising given that the systematic and comprehensive study of careers may assist library administrators in understanding effective vocational development.

Career management literature suggests that professionals such as librarians traditionally pass through specific career stages over their work life. Generally, librarians struggle to fit into their chosen profession during the early career stage. By midcareer, they have mastered many of the intricacies of their vocation. And by late career they begin to prepare for retirement, disengaging themselves from the occupation. Figure 1 summarizes the behaviors and attitudes associated with each of these career stages. Additionally, the figure identifies the prototypical ages during which professionals pass through each stage.

The purpose of the present study is to investigate how attitudes toward the profession evolve as librarians age and pass through these progressive career stages. To derive justifiable predictions about the relationship between age and affective career outcomes, hypotheses...
### FIGURE 1

<table>
<thead>
<tr>
<th>Career Stages</th>
<th>Typical Behaviors and Attitudes</th>
</tr>
</thead>
</table>
| Early Career Ages 25–40| • Newcomers enter the profession with naive and unrealistic expectations.  
                           | • Enter profession in positions of marginal responsibility and challenge.  
                           | • Just beginning process of career investment.  
                           | • If career fit undesirable, opportunities to change profession.  
                           | • Struggling to internalize the values of the career. |
| Midcareer Ages 40–55   | • More realistic about the ability of career to satisfy needs.  
                           | • Highly productive phase, as requirements of the career have been mastered and difficult performance goals are established. |
|                        | • As skills become organization and career-specific, career change would require substantial reinvestment.  
                           | • Opportunities for career change begin decreasing with increasing age. |
|                        | • Fully socialized into the profession, adopting values congruent with those of the field. |
| Late Career Ages 55–70 | • Decreased expectations.  
                           | • Maintain reasonable productivity while possibly influencing policy decisions.  
                           | • Although active career investment may decrease, passive investments continue to accrue.  
                           | • Ageism and obsolete skills preclude alternative careers.  
                           | • Focus shift from career to nonwork activities in preparation and anticipation of retirement. |

were formulated based on career stage theory. Career stage theory implies an “ontogenesis” perspective which assumes that human attitudes change regularly throughout the life span in a predictable fashion.

**HYPOTHESIS DEVELOPMENT**

As individuals graduate from library education programs and enter the vocation of librarianship, they often bring with them naive and unrealistic expectations about the world of work. Newcomers to the field are often overly ambitious and idealistic about their ability to influence the functioning of the library. Instead of assuming positions involving substantial discretion, new hires are often assigned repetitive job duties, lacking opportunity for creative initiatives. The “reality shock” associated with initial expectations being unrealized often induces high levels of frustration and disappointment. Thus, newcomers predictably report low levels of satisfaction.

By midcareer, however, librarians are likely to advance from entry-level positions to those of increased responsibility and authority. Such enriched jobs are both more fulfilling and satisfying. By late career, librarians are likely to assume those positions most instrumental in influencing the direction of the library and their profession. Those not choosing to move up the traditional administrative
hierarchy will likely use their expertise to influence junior colleagues through mentoring relationships. These growth opportunities induce even higher satisfaction with the career.10

**Hypothesis #1: As Librarians Age, Career Satisfaction Will Linearly Increase.**

Though late career librarians may express high levels of occupational satisfaction, this positive effect may be partially attributable to rationalization.11 Aging librarians may cognitively distort any misgivings about the profession because they are entrapped in their careers. Career entrapment reflects the degree to which individuals remain in a field because of the high costs of withdrawal and the lack of available career alternatives.12

Successful entry into a new occupation requires that newcomers adapt their values to be congruent with those of the vocation.

Career changers risk forfeiting investments in time, money, and effort associated with obtaining educational credentials and career-specific skills.13 Besides these economic investments, individuals typically develop emotional attachments and obligations that increase the cost of career change.14 Resource allocation and preserving emotional stakes divert individual energies from scanning the environment for viable career alternatives.15 As external stimuli are ignored, career opportunities pass unnoticed. Individuals experience a constriction in their perception of career options. Such tunnel vision obfuscates opportunities until, with the passage of time, alternatives diminish.16

**Hypothesis #2: As Librarians Age, Career Entrapment Will Linearly Increase.**

Those who are entrapped remain in their career field because of accumulated investments that would be lost if they voluntarily changed professions. However, those who become committed to the librarianship field because of psychological attachments remain loyal because they identify with the goals and values of the vocation. Their career identity reflects an emotional attachment to the profession.

In the early career stage, librarians have not yet been fully socialized into the vocation. Successful entry into a new occupation requires that newcomers adapt their values to be congruent with those of the vocation. During this period of psychological readjustment, librarians display increasing emotional attachment to the profession. Identity peaks in mid-career as librarians become involved in more meaningful and challenging tasks.17 However, as librarians prepare for eventual withdrawal from the career field, they begin to emotionally disengage from their profession turning instead toward family and nonwork activities.

**Hypothesis #3: The Relationship between Age and Career Identity Will Be Curvilinear.**

If librarians in late career tend toward emotional detachment from the job, it is predicted that the relationship between age and career identity will be curvilinear, shaped in the form of an inverted U. As workers deviate from the highly productive middle phase of their careers, they will become less involved and less attached to the values of their profession. In early career, adapting to and becoming socialized into an unfamiliar occupation preclude high levels of identity. In late career, previously high levels of identity wane as librarians disengage in anticipation of retirement.

**METHOD**

**Sample and Procedure**

The initial sample consisted of 137 members of the academic section of a southeastern state library association (response rate = 66.5 percent). Of these respondents, only the 109 with master's degrees were retained for the final sample (about 80 percent female; just over 59 percent married). Association members were surveyed by mail and received a follow-up postcard reminding them to
complete the survey two weeks after the initial mailing. Surveys were accompanied by a cover letter assuring confidentiality. The following prefatory instructions introduced the first section of the survey: “This survey begins with statements about your LINE OF WORK or CAREER FIELD in which you are currently employed. You may consider line of work/career field as having the same meaning as occupation, profession, or vocation.” Following the line of work/career field items, the surveys requested demographic-related information including marital status, chronological age, gender, position tenure, and educational level.

Measures
A five-point-rating scale was used to measure career responses (1 = strongly disagree to 5 = strongly agree). Items used in the career measures are provided in appendix A.

Career Satisfaction. A five-item career satisfaction measure (alpha coefficient = .76), adapted from the psychometrically sound job satisfaction index developed by Brayfield and Rothe, was used to assess enjoyment with one’s line of work.18

Career Entrapment. Career entrapment (alpha coefficient = .86) was tapped with a twelve-item measure of adequate reliability and construct validity.19

Career Identity. Career identity was gauged using a four-item measure (alpha coefficient = .79) that has satisfactory psychometric properties.20

Data Analyses
Because the hypotheses suggest that the relationships between age and career attitudes could assume either a linear or a curvilinear form, hierarchial polynomial regression analysis was performed. To reduce possible confounding resulting from the established relationship between time-related and attitudinal variables, position tenure was controlled by entering it in the first step of each equation.21 For each equation, age was entered in the second step, followed by the age² term (age X age) in the third step, and the age³ term (age X age X age) in the fourth step. If linearity best describes the form of the relationship, the age term alone should explain a significant portion of the criterion variance while the higher order terms should not. If the relationship is curvilinear or U-shaped, the age² term should explain a significant portion of the variance beyond the age term. Finally, if the relationship is S-shaped, the age³ term should be significant.22

RESULTS
Table 1 presents a triangular disclosure matrix including the career attitude variables as well as position tenure, age and age². The table also includes means and standard deviations for each variable, and reliability estimates where appropriate. The age³ variable did not enter into any of the regression equations, so it was excluded from the correlation matrix.

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>S.D.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td>44.16</td>
<td>9.40</td>
<td>(NA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Age²</td>
<td>22,037.09</td>
<td>851.13</td>
<td>.99</td>
<td>(NA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure (mos.)</td>
<td>76.17</td>
<td>84.35</td>
<td>.34</td>
<td>.36</td>
<td>(NA)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Career identity</td>
<td>4.06</td>
<td>.67</td>
<td>.15</td>
<td>.13</td>
<td>.09</td>
<td>(.79)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Career</td>
<td>4.23</td>
<td>.46</td>
<td>.22</td>
<td>.22</td>
<td>-.05</td>
<td>.28</td>
<td>(.76)</td>
<td></td>
</tr>
<tr>
<td>satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Career</td>
<td>2.84</td>
<td>.63</td>
<td>.25</td>
<td>.25</td>
<td>.08</td>
<td>.24</td>
<td>-.01</td>
<td>(.86)</td>
</tr>
</tbody>
</table>

Note: n = 109. For r > + .21, p < .05; for r > + .26, p < .01, both two-tailed. Reliability estimates are in the diagonal.
Table 2 presents the results of the regression analyses controlling for position tenure. As can be detected from this table, the relationships between age and career satisfaction and age and career entrapment were linear. The relationship between age and career identity was curvilinear, as the age² term entered into the equation. Thus, all three hypotheses were supported.

Each of the three equations is plotted in figure 2. This figure reveals that career identity peaks when librarians approach the midcentury mark. Both

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Beta</th>
<th>R²</th>
<th>Change in R²</th>
<th>Fstep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career identity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position tenure</td>
<td>.09</td>
<td>.01</td>
<td>.01</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Age</td>
<td>1.67</td>
<td>.02</td>
<td>.01</td>
<td>1.7</td>
</tr>
<tr>
<td>Age²</td>
<td>-1.57</td>
<td>.06</td>
<td>.04</td>
<td>3.6*</td>
</tr>
<tr>
<td>Career satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position tenure</td>
<td>-.17</td>
<td>.01</td>
<td>.01</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Age</td>
<td>.18</td>
<td>.07</td>
<td>.06</td>
<td>7.5**</td>
</tr>
<tr>
<td>Age²</td>
<td>.12</td>
<td>.07</td>
<td>.00</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Career entrapment</td>
<td></td>
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<td></td>
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<tr>
<td>Position tenure</td>
<td>-.03</td>
<td>.01</td>
<td>.01</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Age</td>
<td>.08</td>
<td>.06</td>
<td>.05</td>
<td>6.6**</td>
</tr>
<tr>
<td>Age²</td>
<td>.19</td>
<td>.07</td>
<td>.01</td>
<td>&lt; 1</td>
</tr>
</tbody>
</table>

* p < .05; ** p < .01
career satisfaction and career entrapment increase steadily throughout the librarians’ working years.

The results of this study should be considered in light of some limitations. First, the form of the relationships between age and career attitudes may be affected by the composition of the sample. The same analyses using different occupational groups may reveal differently shaped regression curves. Second, the data analyzed were collected cross-sectionally rather than longitudinally. Data collected over librarians’ life spans may reveal additional insights—particularly when those librarians follow atypical career patterns. In addition, it should be recognized that results from those in late career might be biased due to a self-selection effect; that is, those who are career dissatisfied may have already changed fields at a younger age. Lastly, future researchers may wish to expand our sample by surveying librarians in nonacademic settings as well as those in other geographical regions, as members of the present sample all resided in a single southern state.

DISCUSSION AND IMPLICATIONS

The results show a linear relationship between age and career satisfaction indicating that as librarians age, they become increasingly pleased with their profession. Librarians lowest on career satisfaction are those in their early career stage. These professionals come to the career field with extremely high but unrealistic expectations about the field’s ability to satisfy all their self-actualization needs—needs that cannot possibly be met by any career field. Thus, junior careerists are likely to become disillusioned. Yet novice dissatisfaction might be reduced through the provision of realistic job previews.

Realistic job previews involve providing applicants candid information about not only the positives but also the drawbacks of a position. These previews serve to lower initial expectations to realistic levels, which increases satisfaction and ultimately reduces voluntary withdrawal. Realistic job previews are typically provided by either interviewers or coworkers. But as technology advances, future researchers might investigate whether realistic job previews can be communicated effectively through interactive computing or videotapes—media thoroughly familiar to academic librarians.

Unlike those in the early career stage who initially may be placed in impoverished positions, midcareer librarians are often challenged by their jobs. But overchallenge may be burdening and overwhelming. Motivation theory posits that difficult goals can stimulate increased levels of productivity. However, these goals may create dissatisfaction because they are often unattainable and seldom realized. Administrators can help the overchallenged mid-career librarian by: (1) establishing moderate goals rather than difficult ones; (2) setting two goals, one that is fully achievable and another that is ideal; (3) recognizing partial success toward meeting difficult goals; (4) incrementally raising goal difficulty; and (5) defining goal difficulty, not in terms of success probability, but by time and effort requirements.

Like career satisfaction, career entrapment shows a linear relationship with age. Those entrapped in their careers have significant career-specific investments in librarianship, are involved in social networks that would be emotionally difficult to sever, and perceive few alternative career options available. In addition to the obstacles impeding career change, many entrapped librarians have limited opportunity to move up the pyramid in a library’s hierarchy. Organizational gridlock is imposed by flattening organizations, retrenchment in higher education, and fierce competition for upper-level positions. Career immobile employees, however, can offer a great deal to libraries if they are managed properly. Literature in the human resource domain offers suggestions for dealing with employees who have stagnated in their careers and lost motivation for self-development. Recommendations include providing
opportunities for involvement in special projects, permitting job rotation, facilitating downward, lateral or cross-functional moves, and allowing temporary reassignments. Other, less traditional guidance includes encouraging a "psychological success" culture, avoiding a paternalistic orientation to career development in which the individual abdicates responsibility, advocating short rather than long-term planning, facilitating lifelong learning, sanctioning more diverse career paths, and focusing on accomplishment rather than only on potential. Such career management techniques may satisfy needs and eliminate potential negative consequences, such as deterioration in morale and decrements in performance.

Demographic analysis suggests that over the coming decades it will be more difficult to recruit new qualified librarians, while those currently employed will become increasingly entrapped.

While career entrapment and career satisfaction show a linear relationship with age, career identity displays an inverted U pattern. That is, career identity is optimal at the midcareer stage, but suboptimal in early and late career stages. To increase early career identity, librarians can be encouraged to become involved in professional associations. In late career, identity can be increased by encouraging mentoring. Typically, mentors serve outside the formal reward structures while promoting the careers of their protégés. While developmental benefits accrue to the protégé, mentoring can also benefit the organization as well as the mentor. Serving as a mentor for a less experienced colleague can effectively enhance feelings of self-efficacy. And such interpersonal relationships may help meet affiliation needs, thereby reducing dysfunctional stress.

As environmental pressures are forcing academic library restructuring and placing heightened importance on accountability, it is becoming increasingly important to effectively manage librarians of all ages. Demographic analysis suggests that over the coming decades it will be more difficult to recruit new qualified librarians, while those currently employed will become increasingly trapped. Therefore, the management of career development is becoming a paramount supervisory skill.

Notably, career development influences both individuals and the libraries in which their professions unfold. Librarians dissatisfied with career progression may turn into organizational liabilities either through substandard performance or through withdrawal behaviors. In contrast, successful career management fosters personal productivity and workplace commitment. This research begins shedding some light on responses to career stagnation and dissatisfaction and offers strategies for effective career development. Further examination of these issues may offer even more insight.

REFERENCES AND NOTES
2. Jeffrey H. Greenhaus, Career Management (Hinsdale, Ill.: Dryden Pr., 1987).
4. Ibid.
APPENDIX A

Career Satisfaction Items

- My line of work/career field is usually interesting enough to keep me from getting bored.
- I am often bored with my line of work/career field.
- I feel fairly satisfied with my present line of work/career field.
- My line of work/career field is pretty uninteresting.
- I find real enjoyment in my line of work/career field.

Career Entrapment Items

- I have too much time invested in my line of work/career field to change.
- If I left this line of work/career field, I would feel like I had no reasonable options.
- There would be a great emotional price involved in changing my line of work/career field.
- Given my experience and background, there are attractive alternatives available to me in other lines of work/career fields.
- Changing my line of work/career field would be easy from an emotional standpoint.
- I would have many options if I decided to change my line of work/career field.
- It would be very costly for me to switch my line of work/career field.
- Leaving my line of work/career field would cause little emotional trauma in my life.
- I am pleased that I have many alternatives available for changing my line of work/career field.
- For me to enter another line of work/career field would mean giving up a substantial investment in training.
- It would be emotionally difficult to change my line of work/career field.
- I have too much money invested in my line of work/career field to change at this time.

Career Identity Items

- My line of work/career field is an important part of who I am.
- This line of work/career field has a great deal of personal meaning to me.
- I do not feel "emotionally attached" to this line of work/career field.
- I strongly identify with my chosen line of work/career field.
Individualized Instruction for Undergraduates: Term Paper Clinic Staffed by MLS Students  
Ethel Auster, Rea Devakos, and Sian Meikle

In academic libraries, shrinking budgets and expanding enrollments are forcing reference librarians to explore innovative ways to provide individualized services to their clients. Meanwhile, library schools are seeking ways to enhance the educational experience of their students and to provide them with a competitive advantage in a tight job market. At the University of Toronto, the Sigmund Samuel Library and the Faculty of Library and Information Science joined forces to mount a Term Paper Clinic for undergraduates that was staffed by MLS students. This service provided research strategies to first- and second-year undergraduates working on term papers. This article describes the planning, implementation, and assessment of the TPC and provides recommendations for similar undertakings in the future.

Providing quality service to undergraduate students at large urban universities has become a goal that is increasingly difficult to achieve. On the one hand, the prolonged economic downturn has led to increased enrollments as people return to the university in the hope of becoming better qualified for the job market when the economy finally improves. On the other hand, university libraries have pared staff to the minimum to meet the exigencies of shrinking budgets. Today a situation exists in many university libraries where increased demands are made upon resources already taxed to the limit. This was the state of affairs at the Sigmund Samuel Library, the undergraduate library at the University of Toronto, Canada's largest postsecondary institution, when the librarians decided to do something about improving their service to undergraduates.

Meanwhile, across the campus at the Faculty of Library and Information Science, the instructor of the advanced reference course was searching for ways to provide the MLS students with hands-on experience. A meeting between the instructor and the coordinator of library instruction led to the development and implementation of a program that provided a solution to both sets of needs: a Term Paper Clinic whereby MLS students would provide individualized instruction to first- and second-year undergraduates under the overall supervision of professional staff.

**RELEVANT LITERATURE**

While the literature on bibliographic instruction is abundant, the literature on term paper clinics (hereafter, TPCs) is

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sparse. Basically, the TPC is a form of individualized reference service and user education whereby students receive one-on-one instruction on how to locate and use resource materials relevant to their term paper topics. The student may receive a written search strategy including examples of the types of resources available, the appropriate indexes, and the specific subject headings to use. Sometimes a more complete list of citations is provided.

In the literature, the names for this service vary. Patricia Donegan, Ralph Domas, and John Deosdade call it term paper counselling. Tim Schobert refers to it as individualized bibliographic instruction. Gillian Debreczeny uses individualized term paper consultations. For Jamie Coniglio the name that provides the best description is term paper advisory service, while Kathleen Bergen and Barbara MacAdam prefer term paper assistance program. Caroline Rowe opts for individual research consultations while Samuel Rothstein likes point of need/maximum service. The literature that describes using library science students to provide this service is even more limited. The classic article by Rothstein, recalling his experiences at the University of British Columbia in the 1970s, is the most detailed and instructive for those who wish to design and implement such a service.

The benefits of the Term Paper Clinic approach are many. Tim Schobert points out that though course-related subject seminars are given at the University of Ottawa, some students are not exposed to library instruction. For them, the TPC offers an opportunity to come in at their own initiative and on their own time to learn about resources specifically related to their own research topic. Bergen and MacAdam suggest that the in-depth and uninterrupted assistance that the TPC program provides greatly reinforces a student's comprehension. They also present persuasive arguments for the psychological and social appeal of individualized instruction and suggest that this type of instruction leads to a more trusting and comfortable social interaction between the student and the librarian. The result is a more positive learning experience for the student. The library and librarian also benefit. Librarians think that the more personal form of service is intrinsically more satisfying. The profile of librarians in general is raised and the library receives positive PR. Nothing is perfect, however. Debreczeny, though she calls individualized reference "probably the most effective library instruction technique," reminds us that it consumes a great deal of the librarians' time, reaches a limited number of students, requires in-depth subject knowledge, and may create scheduling and staffing problems.

In her survey of bibliographic instruction in the 1980s, Teresa B. Mensching found that the use of Term Paper Clinics in United States academic libraries declined by 4 percent from 1979 to 1987. Administrators may not regard this method as cost-effective and therefore may be reluctant to maintain and increase support for it. Those who have implemented such programs, however, tend to feel positive about them. There is a profile of who will constitute the most likely users and who may benefit the most: freshmen or sophomores writing papers on social science topics who have attempted to do some preliminary research on their own. According to Bergen and MacAdam, more women than men tend to use the service. While much of the evidence presented tends to be anecdotal, the wealth of experience that has been accumulated and presented in the literature ensures that those undertaking Term Paper Clinics can avoid problems and select only those aspects of programs that have met with success. Those wishing to use library school students to staff the Term Paper Clinic are fortunate to have Sam Rothstein to guide them. Of all the articles on TPCs—with or without students—his has the most to offer. It details virtually every procedure that needs to be put in place. It presents drawbacks as well as benefits and generously provides copies of the documents that will be needed by library school instructors and students as well.
as service recipients. We turned to this earlier work for inspiration in planning, implementing, and evaluating our own TPC program.

AIMS OF THE TERM PAPER CLINIC

The instructor of a course entitled Reference Organization and Administration thought that practical experience was an indispensable component of training to become a reference librarian. While students were taught about the reference interview, information needs of specific user groups and reference sources, they had no opportunity outside the classroom to practice their newly acquired knowledge and skills under the experienced guidance of seasoned professionals. From the instructor's point of view, one aim of the Term Paper Clinic was to provide the students with the real-life experience of providing reference service, in this case, to first- and second-year undergraduates. Other aims were to provide the students with an opportunity to test their skills, to interact with real users, and to acquire the taste of working in an academic environment. Finally, the TPC was also seen as a way of providing a course assignment for MLS students that was somewhat more interesting than the usual midterm paper.

From the instructor's point of view, one aim of the Term Paper Clinic was to provide the students with the real-life experience of providing reference service, in this case, to first- and second-year undergraduates.

From the library's instruction perspective, the Term Paper Clinic was intended to serve several other purposes. It would provide in-depth individual consultations and instruction to undergraduates, thus extending the existing consultation service provided to graduate students and faculty in a time of fiscal retrenchment and increasing service needs. It would foster cooperation between Central Library's library instruction services, the Faculty of Library and Information Science, and the Sigmund Samuel Library, the main undergraduate library. It would explore the efficacy of providing an alternative form of library instruction delivery and provide a model of library instruction that would parallel that of the campus writing labs. It would support the university's emphasis on the undergraduate experience and promote the role of the Sigmund Samuel Library as the gateway for undergraduates.

The Sigmund Samuel Library was suited to the Term Paper Clinic concept because it allowed enhanced reference service at one of the busiest times of the academic year. In the Term Paper Clinic, the MLS students were able to offer relatively unhurried one-on-one and in-depth service to users that resulted in a written guide to research. This was a welcome contrast to the inevitably brisk pace of service at the reference desk. The service was also attractive as an alternate form of individualized library instruction, which would help to accentuate the role of the Sigmund Samuel Library for the undergraduate student. Both the instructor and the librarians had some slight reservations about the project. The instructor hoped the students would take their commitment seriously and not jeopardize the future prospects of the program. The librarians worried about the ability of the MLS students to interpret correctly and meet appropriately the information needs of the undergraduates without placing an undue burden on the reference desk.

SETTING

The site chosen for the Term Paper Clinic was the Sigmund Samuel Library. This is the primary library at the University of Toronto serving the undergraduate Arts and Science student body of approximately 20,000 students. It is one of 49 libraries in the University of Toronto Library system, which in total has more than 7.8 million volumes, serving a community of roughly 60,000. The Sigmund Samuel Library has a collection of about 210,000 volumes, and
makes about 250,000 loans annually. Because it is a library for undergraduates, reference service at the Sigmund Samuel Library emphasizes introducing the student to the methods and complexities of university-level research, using resources appropriate to the undergraduate researcher.

PLANNING AND IMPLEMENTATION

MLS students were given both a two-hour in-class and a one-hour in-library orientation session before the Term Paper Clinics began. During the class orientation, the MLS students were introduced to the philosophy underlying reference service at the Sigmund Samuel Library. In particular, emphasis was placed on the need to explain the basic structure of information resources; to present this information so that it could be applied to other research projects; to use tools appropriate to the undergraduate; and to provide the undergraduate with research strategies, rather than a finished body of research, in order to encourage self-teaching. A major focus of training was on the use of UTLink, the University of Toronto's online information system. It contains the University of Toronto library catalog comprised of 4.5 million records, 7.8 million bookforms in 49 libraries, 7 Wilson periodical indexes, a computer-assisted tutorial in library and research skills, Medline, CINAHL, Health, and connections to the Internet. For undergraduate use, we emphasized the library catalog and Wilson as primary resources. Most MLS students were adept users of both the library catalog and the Wilson files. Their training concentrated on pointing out the problems with both the search interface and the respective files and the proposed solutions. Needless to say, given that the library celebrated its one hundredth year in 1992, the union catalog contains a wealth of resources, errors, cataloguing styles, classification systems, and the like.

Effective catalog search strategies and methods of finding materials appropriate for TPC clients were important components of the UTLink training. NAFTA, the North American Free Trade Agreement, was used as a sample search. This search led quite naturally into a discussion of how to gauge the completeness of the search versus the ease with which undergraduates might replicate it. The other focus of training was to discuss how extensive a search was to be conducted and what types of materials were appropriate for undergraduates. In the library orientation session, the MLS students were shown the layout of the Sigmund Samuel Library facilities, and introduced to the major tools available in the reference area. They were also given a brief written summary of the Library of Congress classification, with the important reference works in each area noted.

The Term Paper Clinic was scheduled to run in two-hour time blocks over a three-week period during the busiest part of the 1993 spring term. The exact times were selected, based on the reference statistics of previous years, to coincide with the busiest times of the day and the week, and also to make the service available to part-time students by offering some evening and weekend sessions. The service was designed for, and advertised to, students enrolled in pre-university, first- or second-year undergraduate Arts and Science courses. Two MLS students staffed each session; each graduate student was assigned a total of three sessions. A desk near the reference desk at the Sigmund Samuel Library was designated as the Term Paper Clinic Desk during the clinic sessions. The desk was marked with signs advertising the clinic; basic guides to the Sigmund Samuel Reference collection and reference books in general were available to the MLS students at the desk. Service was provided on a walk-in basis. The MLS students were instructed to spend roughly twenty minutes negotiating the reference questions raised, in each initial session, using a Term Paper Clinic Library Research Guide Form (see appendix A) to record pertinent information. Then, as appropriate, a follow-up appointment was made between undergraduate and MLS
student, preferably within twenty-four hours and at the convenience of each, to deliver the finished Term Paper Clinic Library Research Guide. At the conclusion of the interaction, each undergraduate student was given a Term Paper Clinic Survey (see appendix B) and asked to assess the service and return the survey form to the reference desk as soon as convenient. The MLS students were asked to photocopy all Guide forms twice (for their own and Sigmund Samuel’s records) before giving them to the undergraduate students.

Advertising costs were negligible. The TPC was advertised through flyers and posters distributed in the forty-nine campus libraries, by the student associations, and by the writing labs (see appendix C). The schedule of the TPC was mounted on the opening screen of UT-Link, the university’s online information system. Public announcements prior to the start of each time slot were made in the Sigmund Samuel Library. Librarians at all public service points were encouraged to refer students to the TPC. Announcements were also sent to the student and university papers, but none of the papers picked up the copy or chose to feature an article. One paper did, however, offer to run the public announcement as an advertisement.

TPC CLIENTS ASSESS THE SERVICE

In all, 80 students used the TPC service which was available for 36 hours over a three-week period in the middle of the spring term of 1993. This number was more than enough to keep the 11 MLS students busy. Indeed, most of them reported that each initial query resulted in an additional one to three hours of work following the reference interview. Thirty-nine of the TPC users returned their completed Term Paper Clinic Survey for a response rate of approximately 49 percent. While the response rate is less than we might have wished, it does provide impressions and patterns on which to assess the TPC, and it is on just such information that administrators base their decisions. Survey data are bolstered by the evidence submitted by the MLS students on their Library Research Guides, evaluation forms, and term papers. Predictably, the response rate for the MLS students was 100 percent. Although originally the librarians designed the TPC for first- and second-year students, others were also drawn to it once the clinic was in operation. Not surprisingly, first- and second-year students, the target audience, constituted the majority of users and respondents (56 percent). Third-year students (23 percent) also sought help as did pre-university, transitional year, and other (i.e., special) types of undergraduates (see table 1). It became clear that although first- and second-year students might need individualized help the most, other students were also in need of in-depth assistance and should not be denied help if it were available.

Although originally the librarians designed the TPC for first- and second-year students, others were also drawn to it once the clinic was in operation.

The majority (46 percent) of the respondents were regular library users who used the library five times or more a month. Most were not experienced in writing research papers with 2.59 papers per student being the average. Subject areas ranged across the breadth of the arts and social sciences, including East Asian Studies, Classics, Fine Arts, Physi-
TABLE 2
HOW RESPONDENTS LEARNED ABOUT THE TPC SERVICE

<table>
<thead>
<tr>
<th>Method of Advertisement</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posters in:</td>
<td>30</td>
<td>76.9</td>
</tr>
<tr>
<td>Writing labs</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>Libraries</td>
<td>27</td>
<td>69.2</td>
</tr>
<tr>
<td>Both of the above</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>Elsewhere on campus</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>Referrals by:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word of mouth</td>
<td>3</td>
<td>7.7</td>
</tr>
<tr>
<td>Writing lab</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>Library staff</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>UTLINK Screen</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>Public announcements</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>&quot;Bumped into it&quot;</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>No response</td>
<td>3</td>
<td>7.7</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.1</td>
</tr>
</tbody>
</table>

Just over three-quarters of the respondents (77 percent) learned about the TPC from posters advertising the service. The most effective placement of these posters was at the Sigmund Samuel Library where the TPC was located. Other ways that respondents found out about the service were through referrals by writing lab instructors and other library staff, via the UTLINK screen, through public announcements in the library and in student newspapers, and by accident or fortuitously (see table 2).

Students evaluated their TPC experience in positive terms, with most (68 percent) assessing the service as being very useful or somewhat useful (32 percent) in helping them to research their term paper. All but one respondent noted that their ability to use the library had improved. Perhaps most interesting are the user comments that describe these improvements: the TPC "helped me find the right direction"; "got me started finding information"; "showed me how to research a topic"; "introduced me to new sources"; "showed me new places to look." Some of the users even absorbed library terminology. Most acquired what bibliographic instruction librarians term "transferable skills"; that is, where and how to look for information. The skills that respondents considered to be most important were the need to focus, the importance of using different research approaches, new computer sources and skills, improved skills in locating periodical articles, and using keywords and subject headings.

The skills that respondents considered to be most important were the need to focus, the importance of using different research approaches, new computer sources and skills, improved skills in locating periodical articles, and using keywords and subject headings.

Of all respondents exposed to the TPC, only one said that she would not recommend the service to a friend. Her reason pertained more to the geography of the campus than to the quality of the TPC experience: she thought that it was too time-consuming to walk from her college to the library when she needed every moment to write her papers. Students had a variety of suggestions for improving the service—the most popular being to increase the hours and lengthen the duration. The provision of tailor-made bibliographies and the addition of subject experts were also mentioned.

MLS STUDENT IMPRESSIONS OF THE TERM PAPER CLINIC

The eleven MLS students who participated in the Term Paper Clinic were asked to summarize their experiences in a three-page report. The students described what they had gained from the practicum, any problems they may have encountered or observed, and any
recommendations they had for the coordination of future clinics. The following summary is the result of a content analysis of these papers.

Overall, the students rated the project an overwhelming success and were wholly in favor of having the program continue. Students described the program as a "rewarding experience"; "intensive, draining, but very satisfying"; and "an excellent opportunity to live the library experience, and understand what is really involved in reference work." The project was perceived to be successful, not only for the MLS students but also for their clientele. One MLS student commented that "all of [the] patrons were grateful for the service provided, interested in the suggestions offered, and were often remarkably enthusiastic about researching their papers." In fact, according to this MLS student, "if the Term Paper Clinic was ... responsible for generating some of this enthusiasm, on these grounds alone it can be deemed a success."

WHAT WAS GAINED FROM THE EXPERIENCE

The MLS students considered the practicum a worthwhile experience for a number of reasons. Many of the students thought that this practicum was by far one of their most rewarding assignments at library school because it afforded them the opportunity to gain valuable practical experience. The importance of complementing theory with practice in the learning experience was repeatedly emphasized. As one student succinctly put it: "Theory and passive viewing will not give anyone a genuine understanding of the demands of working the reference desk."

The MLS students thought that the practicum allowed them to test and develop their skills and knowledge, especially in these three areas: question negotiation, reference tools, and bibliographic instruction. Providing reference service gave the students practice at interviewing and refining queries. It also gave them an indication of their strengths and weaknesses in these areas and an idea of where they needed to improve. The MLS students noted that the experience introduced them to various reference sources previously unknown to them, and compelled them to become familiar with the materials in order to be able to tailor specific search strategies for their clients.

For most of the MLS students, this was their first attempt at providing bibliographic instruction, and for this reason alone it proved to be an enlightening and challenging experience. One MLS student noted that he quickly discovered that "as easy as it may be to learn to use a reference tool, teaching this tool to someone else is another matter entirely." For another, the experience prompted her to ponder the significance of this pedagogical aspect of librarianship: "As future librarians, is it enough to learn how to use the reference tools without learning to teach the reference tools?"

For many of the participants, this experience taught them the importance of teamwork in librarianship. The MLS students enthusiastically described the interaction between librarian and client as a team effort, "with both sides working together." As well, the cooperation between librarian and colleague "indicated the importance of teamwork in librarianship and the ability to share knowledge and experience." For another student, this experience was a chance to meet with professional librarians in the field: "The opportunity to discuss the reference process with practicing librarians was part of what made the project successful in my mind."

Clearly, the Term Paper Clinic experience enabled MLS students to gain a new and refreshing perspective on the nature and challenges of everyday reference work. As one student realized: "From the difficult questions I learned one very important thing: reference librarians are not omniscient." The Sigmund Samuel Library also gained from the TPC experience. The load on the reference desk was somewhat eased, and it was apparent that the undergraduate students appreciated the specialized service. The MLS students largely were able to provide the service independently
of the reference desk staff. On the whole, the Library Research Guides provided were useful and appropriate tools that were gratefully received.

PROBLEMS

Although the project was, in general, considered very successful, there were some minor problems and concerns. Lack of confidence on the part of the student librarians, because of inexperience and unfamiliarity with various subjects and disciplines, was perceived as a barrier to providing adequate service to clients.

Of course, delivery of the service was not always simple. Some TPC interactions were complicated because the clients came to the clinic unprepared, or with overly broad topics, or were not informed on the subject they wished to research. Other clients required very basic library instruction in the use of library tools before they could even begin to do research, or had topics that were so obscure that information and resources were difficult or impossible to locate.

One recurring problem was clients who misunderstood the purpose of the clinic. Many clients thought that the Term Paper Clinic would provide essay writing assistance rather than library research assistance. For this reason, some clients had expectations that could not be satisfied. This confusion was most likely the result of the potential ambiguity of the clinic’s name.

Finally, there were also some problems with the location of the clinic. The clinic itself consisted of a table and two chairs, and was located near the reference desk and the OPAC terminals. It became apparent that other students were not aware that the area had been designated for the Term Paper Clinic. Consequently, if the student librarian and client momentarily vacated the area to use other library resources, other students would spot the empty table and move in. Also, the close proximity of the Term Paper Clinic to the photocopiers created a noisy distraction.

These concerns, however, were not unduly troublesome and from the Sigmund Samuel Library’s perspective, the benefits of the service certainly outweighed the drawbacks. The enhanced service and the individualized library instruction were both very attractive and created positive public relations for the library.

RECOMMENDATIONS

The MLS students who participated in the clinic were able to make several suggestions for the improvement of future Term Paper Clinics. To give the students greater confidence it was suggested that there be more training in bibliographic instruction and question analysis prior to the start of the Term Paper Clinic sessions. The name of the clinic was considered problematic, because it led some clients to believe that this was an essay writing service. It was therefore recommended that a more specific name such as “Essay Research Clinic” be used. In addition, brochures and posters advertising the service could be used to inform clientele of the scope of the clinic to avoid misguided expectations.

It was also suggested that there be cooperation between the Term Paper Clinic and the writing lab staff, in several ways. The MLS students could receive training from the writing lab staff in order to help clients narrow and define the topic of their paper. Also, the Term Paper Clinic should have information available on the writing lab in order to redirect and refer students who are looking for writing rather than research assistance. And yet another suggestion was to offer both kinds of service, writing and research assistance, in tandem. Finally, it was recommended that the area set aside for the Term Paper Clinic be clearly marked, to avoid having tables used as a general work area by other library users. Large, visible signage, such as a poster on an easel next to the table could be used to designate the area. MLS students also suggested moving the clinic away from the noise of photocopiers and other diversions, to create a less distracting environment. Though commendable, this last suggestion may reflect an unrealistic image of the environment in which undergraduate reference services occur.
CONCLUSION

Was the TPC worth doing? Absolutely. It largely fulfilled the aims set for it by the instructor and the librarians. Certainly it enlivened the reference course and gave the students a taste of actual reference work. Some were confirmed in their career preference; others realized that academic librarianship was not their strength. The librarians were able to provide an in-depth, labor-intensive learning experience for their students that would have been difficult to do otherwise. Finally, everyone learned a great deal about cooperation, public relations, and team work—lessons that will undoubtedly prove valuable the next time the Term Paper Clinic is offered.

REFERENCES AND NOTES

<table>
<thead>
<tr>
<th>Name:</th>
<th>Year:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone:</td>
<td>Course:</td>
</tr>
</tbody>
</table>

Term paper topic (be as exact as possible)

Term paper due date:

Suggested reference materials:

Suggested search strategy for finding books in UTCat:

Suggested journal indexes and search strategies:

Other suggested libraries and sources:
APPENDIX B

Term Paper Clinic Survey

Please complete and leave at the Sigmund Samuel Reference Desk.

1. How did you hear about the Term Paper Clinic?
   ___ Posters in the library
   ___ Newspaper article
   ___ Library staff
   ___ Other. Please specify: ________________________________

2. (a) Are you in:
   ___ Pre-U   ___ TYP   ___ 1st year   ___ 2nd year
   ___ Other. Please specify: ________________________________

   (b) How many other research papers have you written? ________________________________

   (c) How often do you use the library?
       ___ less than 1 time/month   ___ 1-5 times/month
       ___ more than 5 times/month

   (d) Have you ever used a writing lab?   ___ Yes   ___ No

3. For which course did you use this service? (e.g., ENG 100Y) ________________________________

4. Did you receive help on the spot?   ___ And/or return for a guide?   ___

5. Has this service helped you in researching your essay topic?
   ___ Not at all   ___ Somewhat   ___ Very much
   If so, how? ________________________________

6. Has this service changed your ability to use the library?
   ___ Not at all   ___ Somewhat   ___ Very much
   If so, how? ________________________________

7. Would you recommend this service to a friend?
   ___ Yes   ___ Yes, with reservations   ___ No
   List any reservations: ________________________________

8. List the most important skill you learned from the clinic:
   ________________________________
   or, I didn’t learn a new skill   ___

9. How can we improve this service?
   ________________________________

10. Would you be willing to answer a one-page follow-up survey after you’ve written your essay? If yes, please complete:
    Name: ________________________________
    Address: ________________________________
    City: ________________________________ Postal Code: ________________________________
APPENDIX C

Term Paper Clinic

Have a paper due? Would you like help getting started with the research?

Where:
Sigmund Samuel Library
Reference Area
9 King’s College Circle

When:
First three weeks of February (see calendar)

Who:
This drop-in service is available to any pre-university, first- or second-year Arts & Science undergraduate.

Cost:
Free

<table>
<thead>
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<th></th>
<th></th>
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<td>1</td>
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<td>4</td>
<td>5</td>
<td>6</td>
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<td>2-4 p.m.</td>
<td>2-4 p.m.</td>
<td>4-6 p.m.</td>
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<td>3-5 p.m.</td>
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<tr>
<td>8</td>
<td>9</td>
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<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
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<td>16</td>
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<td>18</td>
<td>19</td>
<td>20</td>
<td>21</td>
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<tr>
<td>2-4 p.m.</td>
<td>2-4 p.m.</td>
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<td>4-6 p.m.</td>
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<td></td>
<td>3-5 p.m.</td>
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</table>

Sigmund Samuel Library
Analysis of Retrieval Performance in Four Cross-Disciplinary Databases: Article1st, Faxon Finder, UnCover, and a Locally Mounted Database
Scott Stebelman

As an increasing number of cross-disciplinary databases become accessible over the Internet, librarians are presented with the dilemma of which to choose to support patron research. Several factors, such as cost, retrospective coverage, and document delivery, are usually considered in making a decision. However, one key factor—citation retrieval performance—is often overlooked because comparative data have been unavailable. A study of four cross-disciplinary databases was undertaken to provide those data. In addition to citation frequency distribution, two other variables were examined: percentage of unique periodicals cited per search and relevancy of citations to stated search topic. An analysis of the data is provided, with its implication for database selection.

The advent of commercial cross-disciplinary databases that can be searched on the Internet has been welcomed and enthusiastically promoted by librarians. These databases are seen as important supplements to traditional printed indexes, to specialized CD-ROM databases, and to other more expensive commercial systems, such as those produced by DIALOG and BRS. In some cases searches are free, while in others the library (or user) either pays an annual subscription fee or a fee for each search statement. If databases are accessed over the Internet, telecommunication charges are negligible.

Several articles have been written about the merits and user reaction of one system versus another, but no article has been published that compares citation retrieval rates for the different systems.1 This factor, however, is important to many researchers, who often need to locate as much literature as possible germane to their topics.

To make such an assessment, three popular and extensively marketed databases were chosen: Article1st (a database on OCLC FirstSearch), UnCover, and Faxon Finder. A locally mounted consortium database, called GENL, was also included in the assessment. This database is comprised of six Wilson databases: Readers’ Guide to Periodical Literature, Business Periodicals Index, Humanities Index, Social Sciences Index, General Science Index, and Index to Legal Periodical Literature.

Scott Stebelman is a Humanities/Social Sciences Librarian at the Gelman Library, George Washington University, Washington, DC 20052; e-mail: scottlib@gwuvm.gwu.edu. The author wishes to thank the following librarians who assisted in the citation relevancy assessment: Daniel Barthell, Shmuel Ben-Gad, Deborah Bezman, W. Chris Fisterup, Elizabeth Harter, Rebecca Jackson, James Kaser, Patricia Kelley, James Kelly, Caroline Long, and Virginia MacEwen. Of course any error in data analysis is attributable to the author.
METHODOLOGY

Thirty subjects spanning a variety of disciplines were searched. These subjects were chosen because they have been discussed frequently in the media, or because they have been common research topics for students and faculty at the author's institution. The searches were conducted during a five-day period in January 1994. Because GENL and UnCover include references predating 1990, but Article1st and Faxon Finder do not, the search period was restricted to 1990-93. UnCover does not index book, motion picture, or music reviews, so these also were excluded. Newspaper articles and duplicate citations appearing in the same search were also left out. To be consistent, searches were entered in the same manner for all databases; this provided advantages for Article1st, UnCover, and Faxon Finder, which automatically "and" terms in bound phrases.

RESULTS

Table 1 indicates the citation frequencies for the thirty searches. Figure 1 illustrates the differences. The range in citation frequency distribution is considerable, with the best performing database outpacing the worst by a magnitude of 3.3 to 1.

To place the citation counts in perspective, it is necessary to indicate the approximate numbers of periodicals indexed by each database at the time searches were conducted.

<table>
<thead>
<tr>
<th>Database</th>
<th>Number of Periodicals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article1st</td>
<td>8,500</td>
</tr>
<tr>
<td>UnCover</td>
<td>14,000</td>
</tr>
<tr>
<td>Faxon Finder</td>
<td>10,000</td>
</tr>
<tr>
<td>GENL</td>
<td>2,200</td>
</tr>
</tbody>
</table>

Hence, even though Article1st retrieved only 57 percent of the number retrieved by UnCover, it indexes only 61 percent of the latter's journal number. In some cases the disparity in retrieval count can be largely explained by the disparity in numbers of journals indexed by each database; however, this correlation breaks down when GENL's figures are examined. The number of periodicals it indexes represents 6 percent of the total, yet it retrieved 45 percent of the total number of citations. Its nearest rival, UnCover, which indexes 40 percent of the total journals, retrieved only 24 percent of the total citations. The explanation for GENL's superior performance probably lies within its subject indexing, a feature lacking in the other three databases, and the frequency with which abstracts are included in citations. This last feature is also included in Article1st, and to a lesser degree in UnCover, but is totally absent in Faxon Finder. It should be noted that keyword searches in Article1st omit the journal title field; this would reduce its retrieval capacity vis-à-vis the other databases.

A chi-square analysis was made to determine whether the statistical differences among the databases were significant. When GENL is included in the analysis, $p < .01$, $df = 3$. Because GENL is a unique composite database, reflecting the idiosyncratic choices of a local consortium, and because its subject indexing provides it an intrinsic advantage over the other databases, a separate chi-square analysis was made which omitted GENL. A significance level of .05 was established, but the differences among the three databases did not meet this level. The null hypothesis—that the frequency distributions are attributable to chance—cannot be rejected.

UNIQUE PERIODICAL CITATION COUNTS

In addition to citation frequency counts, unique periodical citation counts are...
TABLE 1  
CITATION COUNT BY SEARCH TOPIC

<table>
<thead>
<tr>
<th>Subject</th>
<th>Article1st</th>
<th>Faxon</th>
<th>UnCover</th>
<th>GENL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abortion and sex education</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>AIDS and Asia</td>
<td>6</td>
<td>6</td>
<td>11</td>
<td>19</td>
</tr>
<tr>
<td>Arms control and China</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>Art and psychoanalysis</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td>Autobiography and women</td>
<td>3</td>
<td>11</td>
<td>1</td>
<td>31</td>
</tr>
<tr>
<td>Capital punishment and juveniles</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Copyright and piracy</td>
<td>9</td>
<td>6</td>
<td>8</td>
<td>56</td>
</tr>
<tr>
<td>Epic poetry</td>
<td>4</td>
<td>4</td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td>Fellini</td>
<td>14</td>
<td>18</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>France and terrorism</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Frank Lloyd Wright</td>
<td>29</td>
<td>44</td>
<td>52</td>
<td>40</td>
</tr>
<tr>
<td>Free trade, protectionism, and Mexico</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>Gene therapy and ethics</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Humor and 19th century</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Hypertext and literature</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Ishmael Reed</td>
<td>1</td>
<td>6</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Islam and fundamentalism</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>40</td>
</tr>
<tr>
<td>Jackson Pollock</td>
<td>7</td>
<td>12</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>Leadership training</td>
<td>48</td>
<td>25</td>
<td>92</td>
<td>19</td>
</tr>
<tr>
<td>New historicism</td>
<td>15</td>
<td>35</td>
<td>57</td>
<td>15</td>
</tr>
<tr>
<td>Nuclear plants and Russia</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Ontological argument</td>
<td>8</td>
<td>12</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>Ozone layer and Antarctica</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Poetry and San Francisco</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Pornography and the First Amendment</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>21</td>
</tr>
<tr>
<td>Poverty and health</td>
<td>40</td>
<td>63</td>
<td>54</td>
<td>181</td>
</tr>
<tr>
<td>Rap music and violence</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>22</td>
</tr>
<tr>
<td>Suicide and drugs</td>
<td>7</td>
<td>6</td>
<td>8</td>
<td>56</td>
</tr>
<tr>
<td>Transcendentalism</td>
<td>3</td>
<td>11</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td>Vietnam War fiction</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>219</td>
<td>293</td>
<td>386</td>
<td>724</td>
</tr>
</tbody>
</table>

provided. *Unique periodical citations* is defined as the number of individual periodicals cited in a given search; for example, on the topic of "Copyright and Piracy," Article1st retrieved nine citations, seven of which were to different periodicals. Unique periodical citation count is viewed as an important factor in the assessment, because if a database cited more magazines than its competitors, it would have an advantage (magazines are published more frequently than journals). Second, a popular, and sometimes incorrect inference, is that a database that cites a high number of references on a subject is manifestly superior. This may not be the case if the majority of citations come from a few sources. Conversely, a database that has a lower citation frequency count nonetheless may be a valuable resource to scholars because it retrieves citations from a greater variety of publications.

Table 2 displays the data. Chi-square analysis established the differences to be significant at \( p < .01 \). The anomaly previously mentioned is disclosed in these statistics. Although GENL had the highest citation frequency and the highest number of journals cited, it had the
TABLE 2
UNIQUE PERIODICAL CITATIONS

<table>
<thead>
<tr>
<th>Database</th>
<th>Total Cites</th>
<th>Unique Journals</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 1st</td>
<td>219</td>
<td>189</td>
<td>86</td>
</tr>
<tr>
<td>Faxon Finder</td>
<td>293</td>
<td>239</td>
<td>82</td>
</tr>
<tr>
<td>UnCover</td>
<td>386</td>
<td>302</td>
<td>78</td>
</tr>
<tr>
<td>GENL</td>
<td>724</td>
<td>467</td>
<td>65</td>
</tr>
</tbody>
</table>

TABLE 3
CITATION RELEVANCY FIGURES

<table>
<thead>
<tr>
<th>Database</th>
<th>Total Number of Cities</th>
<th>Total Number Relevant</th>
<th>% Relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 1st</td>
<td>219</td>
<td>136</td>
<td>62</td>
</tr>
<tr>
<td>Faxon Finder</td>
<td>293</td>
<td>199</td>
<td>68</td>
</tr>
<tr>
<td>UnCover</td>
<td>386</td>
<td>215</td>
<td>56</td>
</tr>
<tr>
<td>GENL</td>
<td>724</td>
<td>327</td>
<td>45</td>
</tr>
</tbody>
</table>

lowest percentage of unique periodicals within its searches. That means its subject descriptors are retrieving more citations but to fewer individual titles. Moreover, those databases retrieving the fewest number of citations—Article 1st and Faxon Finder—have the highest ratio of unique periodicals to total citations retrieved. Finally, if GENL is omitted in the database comparison, an inverse correlation exists between the number of journals indexed by a database and the percentage of unique periodicals cited. Article 1st, indexing 8,500 journals, has the highest percentage, while UnCover, indexing 14,000, has the lowest. What these data suggest is that the numbers of journals covered do not necessarily predict unique journal citation strength.

One might argue that this analysis is beside the point, given that the raw figures indicate that the databases indexing the highest number of journals retrieved the highest number of unique periodical citations. However, defining database superiority is not so simple: if Database A, which indexes 10,000 journals, retrieves 200 unique journal citations, and Database B, which indexes 7,000 journals, retrieves 180 unique journal citations, can one necessarily assume that Database A outperformed Database B?

Libraries may be more impressed with Database A for the sheer number of unique journals cited, but in terms of measuring the inherent tenacity of a database’s retrieval performance (expressed as a ratio between the number of unique journals covered and the number of unique periodical citations retrieved), a cogent case could be made for Database B. In spite of this perspective, however, the highest raw numbers will probably be compelling to most users, whose need for journal variety is often a paramount consideration.

Another statistic judged to be useful was the number of unique journals cited in one database search and not cited by the other databases. This was thought valuable because libraries and users might want to know how rich a particular database might be in covering periodicals not indexed by its competitors. If all four databases had the same searchable fields, such an analysis could be undertaken; unfortunately, the search field discrepancies already noted precluded this.

RELEVANCE

Although a database might be successful in retrieving high numbers of citations on a topic, it was uncertain how many of these were relevant. To make such a determination, twelve subject specialists at George Washington University evaluated the searches most closely congruent with their subject responsibilities. For example, the subject specialist in biology assessed citations retrieved from the "Gene Therapy and Ethics" search, and the subject specialist for art assessed those retrieved from the "Art and Psychoanalysis" search. As previously mentioned, those databases

Unique periodical citation count is viewed as an important factor in the assessment, because if a database cited more magazines then its competitors, it would have an advantage.

Another statistic judged to be useful was the number of unique journals cited in one database search and not cited by the other databases. This was thought valuable because libraries and users might want to know how rich a particular database might be in covering periodicals not indexed by its competitors. If all four databases had the same searchable fields, such an analysis could be undertaken; unfortunately, the search field discrepancies already noted precluded this.
including subject descriptors and abstracts have an advantage over those databases that do not. To control for these differences, subject specialists were instructed to base their decisions exclusively on the citation and to ignore additional fields. Judgments of relevancy were determined by only one criterion: Was the subject of the citation germane to the search topic?

It must be stressed that because of the large number of search topics and citations retrieved, interscorer reliability was not established for the data. Given the inherently subjective nature of these judgments, the results must be viewed as suggestive rather than conclusive.

Table 3 displays the data analysis of variance, which established the differences to be significant at $p = <.01$. The pattern of data parallels that of table 2. GENL, highest in retrieval frequencies, is also highest in the number of relevant articles retrieved. However, the differences that can be drawn from these numbers are equivocal: while a large number of relevant articles were retrieved, this number—as a ratio of the total number of citations retrieved—was lowest among the four databases. This suggests that in spite of the subject descriptors, some other field in the database is producing false drops. It might be assumed it is the abstract field: abstracts can generate higher numbers of irrelevant citations, because key words within an abstract may be separated by any number of sentences. However, Article1st has the second-highest relevancy rate; yet it also includes abstracts. More research is needed to explain this negative correlation.

CONCLUSION

The results of this study demonstrate that a database that includes subject descriptors and a large number of abstracts has the ability to retrieve more citations than a database that restricts searches to the basic citation fields. Particularly noteworthy was the fact that GENL outperformed its competitors on this measure, even though it indexed far fewer periodicals, and that the citations it retrieved yielded the highest number of unique periodicals. Although GENL retrieved the highest number of citations, the percentage of its citations that were judged relevant to the search topics was lowest among the databases. Ironically, those features that provided GENL with a retrieval advantage—descriptors and abstracts—may also have reduced precision. Statistical analysis of multiperformance measures reveals that none of these databases is clearly superior.

Although GENL retrieved the highest number of citations, the percentage of its citations that were judged relevant to the search topics was lowest among the databases.

In determining which database would be most advantageous for its patrons, libraries will probably consider other factors in addition to retrieval performance. For example, a database that yields a lower number of citations than its competitors might be more user-friendly, and this factor may be weighed more heavily than others in making a final decision. A database might also be offered as part of a package by the vendor that includes auxiliary databases critical to one’s clientele. Cost, of course, is another factor: a database that can be searched freely over the Internet, such as UnCover, and that indexes unique periodicals not covered by the others, will be inherently attractive. Finally, the document delivery features of a service will probably be an important criterion for selection: those services that provide a multitude of suppliers, or that allow orders to be transmitted directly to the interlibrary borrowing unit, will be more competitive than those that do not.

As this study indicates, the identification of a superior database is not always an easy process. Performance has many measures, yet statistics can play a large part in determining which database is an appropriate institutional choice.
REFERENCES AND NOTES


2. The GENL figure was derived by adding the periodicals listed in the Wilson paper editions. Figures for the other databases were given at the time of database logon or were indicated in the vendor's literature.


4. The increased recall and false drops that occur when the abstract field is searched has been noted by Carol Tenopir, "Searching by Controlled Vocabulary or Free Text?," Library Journal 112 (Nov. 15, 1987): 58.

IN FORTHCOMING ISSUES OF COLLEGE & RESEARCH LIBRARIES

Customer Expectations: Concepts and Reality for Academic Library Services
Christopher Millson-Martula

Reactions of Academic Librarians to Job Loss through Downsizing:
An Exploratory Study
Gloria J. Leckie

Electronic Information Technologies and Resources: Use by University Faculty
and Faculty Preferences for Related Library Services
Judith A. Adams and Sharon C. Bonk

A Strategic Analysis of the Delivery of Service in Two Library Reference Departments
Elsa Sjolander and Richard Sjolander
Book Reviews


The Office for Humanities Communication is part of Oxford University Computing Services, but is funded by the British Library Research and Development Department. Its series of *Publications*, of which these are volumes 4 and 6, aims to introduce humanities scholars to ways in which computers impact on their teaching and research. The issues that these two complementary works address also concern many librarians, either as potential creators of electronic information, or as customers for the growing number of commercially produced text and image databases.

Both books include many of the same elements: an introduction discussing why one might undertake such a project and some of the decisions it will require; brief descriptions of some existing projects, their unique problems and the solutions found; and a clear introduction to the technical issues involved. Nevertheless, the emphasis is quite different.

*Digitization of Primary Textual Sources* is concerned with producing digital images of existing materials. Although Robinson’s primary focus is on manuscripts, he also describes projects involving paintings, sculpture, and the preservation of printed materials. Much of the book is given over to a discussion of the various technical choices (e.g., resolution, file formats, compression, image capture with scanners and digital cameras, image storage) and copyright issues. His presentation of these issues will be helpful to those considering any sort of digitizing project. Robinson has clear preferences and does not shy away from specific recommendations, but he also recognizes that local needs and abilities may dictate less than ideal solutions. He is careful to point out the strengths and weaknesses of each approach and gives scaled recommendations for treatment of various types of materials.

The rather specific title of the second book, *Transcription of Primary Textual Sources Using SGML* suggests the difference in its approach. Although Robinson discusses tagging schemes that have been developed for particular materials and admits that for a given, limited project an alternative tagging scheme may provide an effective and efficient solution, this book is less concerned with choosing among alternatives than with introducing the reader to Standard Generalized Markup Language (SGML), particularly as it has been elaborated by the Text Encoding Initiative. The needs of publishers, printers, and large organizations for a standardized markup system independent of language, software, and hardware have brought standardization in this area further along than for digital images. Robinson argues that use of SGML not only saves a great deal of time and energy for scholars, but it also frees future generations from dependence on obsolete hardware and software. “Content-aware” markup of a text is a complex matter requiring many very specific decisions. Robinson’s description of markup will seem overly detailed only to those who have not yet looked at the TEI *Guidelines*. Nevertheless, Robinson offers a useful introduc-
tion to the process of markup, as always emphasizing the decisions to be made, and provides useful examples of the ways in which thoughtful markup can aid analysis of a text.

Robinson has gone to some effort to ensure that these books are up to date (e.g., working from a proof copy of the most recent revision of the TEL Guidelines), and even Digitization (completed in summer 1993) shows little sign of age a year later. A major reason for this is Robinson's success at identifying the emerging standards for treatment of electronic materials. His books are useful introductions to the issues, whatever decisions the reader may make about a particular project. They are of special importance for librarians, who have to worry about more than the needs of one project or about who will want to buy a CD-ROM this year. By urging scholars and publishers to use standardized formats, librarians can provide users with standard interfaces for many different databases, reduce their investment in hardware and software, and, perhaps most importantly, ensure that the best of today's scholarship is available tomorrow, so that we do not have to redigitize or retag hundreds of thousands of images and pages of manuscript because we can no longer interpret them.—James Campbell, University of Virginia, Charlottesville.


At first glance, Chartier's new book would seem to be of extraordinary interest to academic librarians who like to explore the theoretical underpinnings of their profession. We recognize in the author's name a historian of ideas whose chief focus is the history of books and reading. The word order in its title offers provocative layers of meaning, whether applied to individual texts, to book production, to library shelves, to bibliographies. The enticing titles of the three essays comprising the text read "Communities of Readers," "Figures of the Author," and "Libraries without Walls." The twenty-one pages of footnotes refer to a wide range of studies in various languages that one might wish to follow up.

In the essays, originally published in French in 1992, Chartier questions, elucidates, and theorizes about ideas put forth by himself and others on such subjects as the relationships between text, print, and reader; changing perceptions of the connection between author and text, literary property, and censorship; and the various meanings of library (bibliothèque) as space, compilation/condensation, or book catalog. As might be expected, many of his examples or explanations originate out of early modern French culture; for instance, in two of the essays he contrasts Bibliothèques by La Croix du Maine (published in Paris in 1584) and by Du Verdier (published in Lyons in 1585). The essays are ostensibly tied together by a preface and an epilogue, which obliquely suggest what may be the author's taking-off point: Chartier's restating of the "complex, subtle, shifting relationships" between books and their readers in earlier times as a paradigm for his uneasy coming to terms with the world of electronic texts.

In the first essay Chartier emphasizes how meanings of texts depend upon the forms in which they reach readers. Putting the French text of his own book beside the English confirms this point all too ironically. The English—printed and designed in Great Britain although published in this country—is presented with large, clumsy, poorly spaced type. The eight plates (nine in the French) have been unsettlingly resized as well. The appendix containing valuable original language versions of translations within the French text is replaced by an index in the English version. The French version includes a note on Chartier's scholarly interests and a list of his previous books, neither of which is carried over into the English.

Within the text Roger Chartier himself refers to the essays as a "few reflections" or "historian's musings" (les détours his-
toriens). They do inspire the reader to set aside the book and muse, although perhaps not come to any conclusions. If you find the content of The Order of Books elusive and its style opaque, you are not alone.—Elizabeth Swaim, Wesleyan University, Middletown, Conn.


This volume gathers together the idiosyncratic essays of Gordon Graham, a prominent figure in the Anglo-American publishing community for over four decades, having played leading roles at McGraw-Hill and Butterworths. Although no bibliography is presented, the book cover describes the essays as the “distillation and updating” of Graham’s “articles and speeches.” The author reveals in his foreword only that “some of the source material” for the collection has been previously published in venues such as Publishers Weekly and The Bookseller. He suggests that what he has done here is to reconsider his earlier writings, to engage in an “exercise in distillation” and in “third thoughts” on previously visited themes. In an admission typical of Graham’s blend of blunt honesty, irony, glibness, and often frustrating contradictions, he admits impishly that he has not sought permission to have these essays republished. Yet he never reveals whether it was necessary to seek such permission, and we are never sure if anything here had, in fact, been previously published. Given that much of this book focuses on questions of copyright and publishing practice, this minor point of confusion is a forewarning of slippery footing ahead.

The format of the collection is not conducive to a clear view into the world of publishing. The chapters are thematic, with no evident overarching organization or line of development. The themes range from broad topics such as “nationalism and publishing” and “the electronic manifestation” (electronic publishing) to elements of the book publishing system such as “librarians,” “booksellers,” and “authors,” and to practical matters such as “prices” and “missions and fairs.” The diversity does not end there. The essays and mini-essays making up each chapter are not titled; rather, they are each preceded by a location and date, which the author tells us, curiously, are there to remind the reader that the topics are “timeless and placeless, but that there are occasions when one must attempt snapshots.” Sometimes the places and dates fix an experience; sometimes they have little intrinsic relationship to what is being presented. And there is more. The chapters end with self-conscious “interludes”—set off in italics—that Graham inserts to “make sure that neither the author nor the readers take themselves or their work too seriously or too narrowly.” These range from humorous to puffy, while on the whole adding another element of disruption to a generally disjointed set of texts.

Despite the many twists and turns in As I Was Saying, one theme seems continually to underpin the author’s convictions, even if it is not always capable of linking up his essays: the notion that publishers, booksellers, librarians, and authors work in interdependent communities. A corollary that pops up in Graham’s wry observations is that many of the problems separating these communities might be solved to some degree if they recognized their common causes and communicated more often in terms of their mutual interests. Readers of College & Research Libraries will be interested in seeing this theme presented most forcefully in the chapter devoted to librarians. Indeed, the theme of this chapter is really the interdependence of publishers, booksellers, librarians, and authors within the book world, rather than librarians or librarianship. Graham’s remarks on topics such as bibliographies and bibliographic publishing in this chapter (in the essay under “Stockholm 1990”) are superficial and misleading. Librarians are advised to resist the urge to read about themselves. A more useful strategy for reading the book is to search out the many stimulating re-
marks, scattered passim, on copyright and electronic publishing.

For the academic librarian, the strength of Graham's essays lies in the insight they offer into the rationales and practices that govern management of the publishing business. He approaches these subjects with a mixture of frankness, informality, and sagacity that pushes the reader in interesting directions. Still, _As I Was Saying_ fails to lead beyond observations miscellaneously presented, and Graham neglects to link his ideas with arguments capable of clarifying and deepening our understanding of the dynamics of contemporary publishing.—Henry Lowood, Stanford University, Stanford, California.

**Vickery, Brian C., and Alina Vickery.**


Despite the promise of the title, this volume is concerned with a broad treatment of the essential scientific aspects of information science rather than its practice _per se_. In their preface the authors call it "an attempt to present and discuss a scientific understanding of the processes of information transfer . . . [as] a human, social activity. . . ." As such, it covers a wide range of topics in information science, but in the context of established research and not contemporary practice. Its ten chapters deal with three broad categories: information transfer in the wider societal context, information and the individual, and the nature of information systems. Rather than integrating disparate studies from fields such as anthropology, psychology, and computer science, the authors focus on more applied aspects of these fields in the formal study of information. This book can rightly claim to be a "core" text on information science as a distinct discipline, not an integration of information science with these disciplines.

Specifically, the authors address the nature of information from the fundamental exchange of information at the microbial level (including an amusingly disgressive discussion of the reproduction of a bacteriophage that illustrates communication in nature) to the nature of language, logic, basic forms of information, and the personal semantic experience of information retrieval. This presentation is quickly incorporated into the context of the information system, with the text as the fundamental type of information considered and traditional publication and libraries as the primary sites of dissemination. Some topics, such as the implications of linguistics, necessarily are dealt with superficially to allow larger themes to emerge. While the authors discuss electronic interfaces, systems, and databases, it is in the context of a much broader understanding of human information processing and systems.

The Vickerys artfully integrate the results of hundreds of studies into this broad sketch, providing the reader with both concise summaries of the core research in various areas as well as pointers for further reference and study. At the same time, the omission of the context of practice and of an integration of contemporary issues that are rapidly changing the nature of the field may limit the value of this otherwise excellent book. To a degree, the authors acknowledge this problem, but the work suffers nevertheless from its failure to incorporate the human experiences of recent innovations in technology and their implications for both theory and practice. They tend to rely on older examples of particular technologies, such as MYCIN, an expert system of the 1970s, rather than the many online, CD-ROM, and network-based resources that are now much more familiar.

This book is expertly written with a long-term perspective, encapsulating well-established research dating from the emergence of the modern discipline of information science in the postwar era to some developments up through the mid-80s. The erudition and experience of the Vickerys are manifest in both the selection of their topics and the formal, polished style with which they are presented. The book skillfully combines the subject areas of traditional library science
(such as file and record organization, the reference interview, and information systems databases) with the scientific study of information retrieval models drawn from other contexts.— Matthew Wall, Drexel University, Philadelphia, Pennsylvania.

SHORT NOTICES


A recent exhibition of manuscripts and early printed books from the collections of the Italian state libraries ("the places of written memory" alluded to in the title) documents their role in creating and preserving a cultural heritage. In three sections, each supported by explanatory essays, the catalog focuses on the works of early monastic libraries ("I Libri del Silenzio"); the collections of manuscripts and printed volumes of the great Renaissance libraries, such as the Medicea Laurenziana of Florence and Modena's Estense ("I Libri del Decoro"); and treasures from the libraries of Italy's cardinals ("I Libri del Porporo"). Lengthy entries for each manuscript or book exhibited give its provenance, historical significance, and place within a particular collection. Bibliographic notes lead the reader to secondary sources. A helpful index of the manuscripts in the exhibition, arranged by current library location and collection, gives some sense of the riches of each of the major state libraries represented here. The catalog is well designed and beautifully illustrated. (JB)


This booklet, the sixth in the "Collection Management and Development Guides" series, is based on Paul Mosher and Marcia Pankake's guidelines published in the October/December 1983 issue of Library Resources and Technical Services. In outline format and very sparse prose it sketches the basics of cooperation: the benefits, the "challenges," (the kinder, gentler '90s term for the "problems" of the 1983 edition), types of cooperatives, varieties of cooperative activities, planning and implementing the agreement, assessing and strengthening resources, and providing bibliographic and physical access. A directory of cooperatives, a glossary, and an extensive bibliography complete this carefully prepared publication. (SL)


Specialized journals of this kind are all but irresistible to their particular target markets, which is not to say that the need isn't real enough. This new journal was conceived to redress the perceived marginalization of college libraries and their concerns in the professional literature. It emphasizes the practical and day-to-day, with a corresponding de-emphasis on what we call "research" and "theory." Articles in the first issue cover topics such as "holistic" librarian-ship, summers off, citation analysis of freshman papers, a bar-coding project, textbooks in the collection, food in the library, library-skill workbooks (plus ça change . . .), accessing the Internet. Some, but not all of these offer a uniquely "college" perspective, but much of it, at least in this first issue, is depressingly familiar. (SL)

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