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50LRTS
FIFTIETH ANNIVERSARY

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Association for Library Collections & Technical Services
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For current news and reports on ALCTS activities, see the *ALCTS Newsletter Online* at www.ala.org/alcts/alcts_news.

Editorial

Peggy Johnson

I'm delighted to publish "A Look at Fifty Years of *Library Resources & Technical Services*," by Tschera Harkness Connell, in this issue. Connell's paper, which was commissioned in honor of the fiftieth anniversary of the Association for Library Collections & Technical Services, provides a retrospective look at 200 issues containing 1,785 articles, editorials, literature surveys, and more. She examines the journal from several perspectives, including co-authorship, gender of authors, and subject content, and how these have changed over fifty years.

The last issue in volume 51 marks a transition in the membership of the *LRTS* Editorial Board. I want to thank those members who left the board after the June 2007 Annual Conference in Washington, D.C., for their years of service. They are:

- Christina Bellinger (University of New Hampshire)—Council of Regional Groups Representative
- Carroll Nelson Davis (Library of Congress)—Intern
- Sue Kellerman (Pennsylvania State University)—Preservation and Reproduction Section Representative
- Norm Medeiros (Haverford College)—Cataloging and Classification Section Representative
- James Stickman (University of Washington)—Member at Large

New members are:

- Kristen Antelman (North Carolina State University)—Cataloging and Classification Section Representative
- Yvonne Carignan (University of Maryland)—Preservation and Reproduction Section Representative
- Ellen Coghlan (EDUCAUSE)—Member at Large
- Dawn Hale (Johns Hopkins University)—Council of Regional Groups Representative
- Judy Jeng (New Jersey City University)—Intern

I wish to recognize those who are essential to producing the issues that arrive in your mailboxes every month: Chris Keech and Angela Hanshaw, production editors, and Christine Taylor, our ALCTS staff liaison.

The *LRTS* Editorial Board members have several responsibilities, one of the most important of which is serving as reviewers of papers submitted to *LRTS*. In addition to the board members, others occasionally are asked to review papers either because of the specific expertise needed or because board members are unavailable. In the past year, Stephen Hearn (University of Minnesota) also served as a reviewer. I hope you will have an opportunity to thank your colleagues listed here for their important contributions to the success of *Library Resources & Technical Services*.

Association for Library Collections & Technical Services Annual Report 2006–2007

By Bruce Chr. Johnson, 2006–2007 ALCTS President

The Association for Library Collections & Technical Services (ALCTS) celebrated its first fifty years during 2006–2007. This celebration took the form of looking back, assessing where we are today as an association and as a profession, and considering where we would like to see our profession in the years to come. This year was punctuated by great tumult in the collections and technical services fields, and ALCTS focused much of its energies on directive change and professional advocacy. In doing so, the most tangible achievements came in the areas of education, dialog and collaboration, publication, standards creation, and organizational renewal.

Fiftieth Anniversary Events

ALCTS celebrated the fiftieth anniversary of both the association as well as its flagship scholarly publication, *Library Resources & Technical Services* (*LRTS*). The anniversary theme has been "Commemorating the Past, Celebrating the Present, Creating the Future." An exciting array of events was planned by the ALCTS Fiftieth Anniversary Celebration Committee, ably led by 2002–2003 ALCTS president Olivia M. A. Madison. The following is a synopsis of a few of the anniversary events.

Definitely Digital: An Exploration of the Future of Knowledge on the Occasion of the Fiftieth Anniversary of the Association for Library Collections & Technical Services

This symposium, held January 19, 2007, in Seattle, Washington, in conjunction with the American Library Association (ALA) Midwinter Meeting, examined significant changes in scholarly communication, library services, collections, and staffing created by the digital environment. The symposium speakers discussed scholarship in the digital age, new communication models, the future of cooperative technical services and enabling technologies, and the training and education of staff working with digital collections. Statements, intentionally controversial and intended to evoke discussion from the panelists and stimulate audience participation, are the subject of Digiblog, ALCTS' first Web log.

The speakers and topics at the symposium were:

- Keynote speaker: James Hilton (University of Virginia): "Scholarship in the Digital Age: Opportunities and Challenges";

Bruce Chr. Johnson (bjoh@loc.gov) is Assistant Chief, Cataloging Distribution Service, Library of Congress, Washington, D.C.

- Lorcan Dempsey (OCLC): "Moving to the Network Level: Networks Change Structures";
- Meg Bellinger (Yale University): "Library Collections and Technical Services in the Digital Age: Perspectives and Predictions for the Profession at the Half-Century Mark";
- Greg Tananbaum (author and consultant): "Scholarly Communication 2.Oh: New Models of Publishing and Library Services"; and
- Brian Schottlaender (University of California-San Diego), Tom Clareson (PALINET), David Nuzzo (SUNY–Buffalo Library), Oliver Pesch (EBSCO Information Services), and Robert Wolven (Columbia University Libraries).

Interactive Futures: A National Conference on the Transformation of Library Collections and Technical Services (ALCTS National Conference, June 20–21, 2007, Washington, D.C.)

This day-and-a-half-long conference engaged attendees in a thought-provoking, open, and participatory exchange on the transformation of our work and the profession. Presenters and attendees collaborated to explore the challenges we face and to develop a vision of the future roles of collections and technical services librarians. Participants were enriched and energized by this experience. After the three plenary session speakers, attendees had an opportunity to discuss how the issues and insights the speakers offered will affect the future of technical services. These sessions, led by an outstanding group of facilitators, provided a forum to explore the challenges we face and to develop a vision of the future roles of collections and technical services librarians.

The plenary session speakers and topics were:

- Richard Lanham: "The Two Markets: Libraries in an Attention Economy";
- David Lankes: "Collecting Conversations in a Massive Scale World";
- Dianne van der Reyden: "Preservation at the Library of Congress"; and
- Stephen Abram: "Social Libraries: The Librarian 2.0 Phenomenon."

Findability: Librarians, Libraries, and the Internet of Things with Peter Morville (ALCTS President's Program, June 25, 2007, Washington, D.C.)

Peter Morville is author of *Ambient Findability* and president and founder of Semantic Studios, a leading information architecture, user experience, and findability consultancy. He is widely recognized as a father of the information architecture field, and he serves as a passionate advocate for the critical role that findability plays in defining the user experience.

Forums

Many of the issues that ALCTS explored this year did not lend themselves to longer-range program planning. The association now is using the forum construct to allow for open discussion of hot issues with very short planning timelines. The following is a listing of forums from the 2007 Midwinter Meeting in Seattle. Details for forums at the 2007 Annual Conference in Washington, D.C., were not finalized at the time that this report was being written.

- "Collection Management and Development Section Forum on Collecting E-Resources Use Data: Outsource or In-house?"
- "Disaster Recovery Forum"
- "Forum on Library Education"
- "Forum on Non-English Access"
- "Forum on the Future of Cataloging"
- "Publisher Vendor Relations Open Forum: Libraries and University Presses Working Together?"
- "Resource Description and Access (RDA) Update Forum"
- "Ripped from the Headlines"

Continuing Education Events

ALCTS CE falls broadly into two categories: workshops intended to introduce practitioners to basic and intermediate skills, and workshops and events focused on emerging trends in the profession. Nineteen workshops, institutes, preconferences, and Web-based courses were successfully offered a number of times during 2006–2007. Participant feedback was consistently very positive. The CE events were:

- ALCTS National Conference (Washington, D.C., June 20–21, 2007);
- Basic Collection Development and Management Workshop (Philadelphia, March 22–23, 2007);
- Basic Creation of Name and Title Authorities Workshop (Chicago, April 30–May 1, 2007);
- Basic Subject Cataloging Using LCSH Workshop (Washington, D.C., April 4–6, 2007);
- Comprehensive Series Training (Washington, D.C., June 21, 2007);
- Definitely Digital–Midwinter Meeting Symposium (Seattle, January 19, 2007);

- Digital Project Management Basics Workshop (Chicago, December 8, 2006);
- Fundamentals of Acquisitions, a Web-based course (July 10–August 4, 2006; August 28–September 22, 2006; October 16-November 10, 2006; February 12–March 9, 2007; May 21–June 15, 2007);
- Fundamentals of Library of Congress Classification Workshop (Washington, D.C., June 21, 2007);
- Map and Geography Round Table (MAGERT) Rare, Antiquarian, or Just Plain Old: Cataloging Pre-Twentieth Century Cartographic Resources Pre-conference (Washington, D.C., June 21, 2007);
- Managing the Multigenerational Workplace: Practical Techniques Preconference (Washington, D.C., June 22, 2007);
- Metadata and Digital Library Development Workshop (Washington D.C., July 17–18, 2006; Chicago, December 11–12, 2006; Seattle, January 17–18, 2007);
- Metadata Standards and Applications Workshop (Chicago, July 24–25, 2006; Syracuse, N.Y., April 19–20, 2007);
- Principles of Controlled Vocabularies and Thesaurus Design Workshop (Washington, D.C., April 12–13, 2007);
- Rules and Tools for Cataloging Internet Resources Workshop (Chicago, April 16–17, 2007)
- A Supervisor's Academy: Essentials of Supervision for the Professional Librarian (Richmond, Va., June 7–8, 2007);
- Technical Services Management: Generational and Workflow Issues Pre-conference (Washington, D.C., June 22, 2007);
- What They Don't Teach in Library School: Competencies, Education, and Employer Expectations for a Career in Cataloging Pre-conference (Washington, D.C., June 22, 2007); and
- Workflow Analysis, Redesign, and Implementation: Integrating the Complexities of Electronic Resources in the Digital Age Pre-conference (Washington, D.C., June 22, 2007).

Additional workshops are being developed by various ALCTS groups, some in collaboration with outside groups, such as the Program for Cooperative Cataloging and the Cataloger's Learning Workshop. Although several of this year's workshops were delivered in a distance learning mode, there is considerable interest and volunteer investment in broadening additional opportunities to make them available to many more for whom face-to-face workshops are less than optimal. These efforts are being pursued concurrently with an exploration of a more curricular approach to continuing education.

Publications

The ALCTS publishing program is flourishing. A new volume on business resources appeared in the Sudden Selector Series, and several new titles in the ALCTS Papers series were issued. In addition to the new print publications, a number of new online resources became available.

New titles and series included:

- Commemorating Our Past, Celebrating Our Present, Creating Our Future: Papers in Observance of the Fiftieth Anniversary of the Association for Library Collections & Technical Services;
- Managing Electronic Resources: Contemporary Problems and Emerging Issues;
- Perspectives on Serials in the Hybrid Environment;
- The Preservation Manager's Guide to Cost Analysis;
- Salsa de Tópicos/Subjects in SALSA: Spanish and Latin American Subject Access; and
- Sudden Selector's Guide to Business Resources (Sudden Selectors Series/Collection Management and Development Section).

Forthcoming titles and series include:

- Bound Right: A Librarians Guide to Managing Commercial Binding Activities;
- Copy Cataloging Done Smarter: Using PCC Records in Non-PCC Libraries; and
- Guide to the ANSI/NISO/LBI Standard for Library Binding.

Web publications included:

- Guidelines for Cataloging Record Sets: Reproductions (Microform and Electronic) and Original Sets.

In addition, *ALCTS Newsletter Online* (*ANO*) Editor Mary Beth Weber has done an outstanding job this year in enhancing both the content and format of our online newsletter. Initiatives included:

- The format was expanded to enable readers to read or print an entire issue in one continuous display.
- Author guidelines are included with the masthead and editorial policy.

- A listing of all submission deadlines for the year now is included in each issue of *ANO*. This includes regular features, such as Sage Support Staff Travel Grant reports, International Federation of Library Associations and Organizations (IFLA) reports, and conference announcements and post-conference reports.
- The "Looking Ahead" feature (a calendar of upcoming conferences and events) now includes a note that reports from that events listed in the calendar are welcome, as are additions to the calendar.

Organization

Budget and Finance Committee

During the 2004–2005 year, ALCTS raised its personal and institutional membership dues by $10 per year. This increase was intended to fully fund the association's ongoing operation. We have had two years to assess this change's impact, and membership levels have held steady while ALCTS has essentially achieved a balanced budget for the first time in several years.

Organization and Bylaws Committee

The Organization and Bylaws Committee this past year proposed the removal of section names and objectives from the ALCTS Bylaws, a change that was subsequently ratified by an ALCTS membership vote. This is a significant move, because it now gives section leaders the ability to more easily and efficiently revise and update their names and mission statements to reflect current goals, emphases, and values. In a time when rapidly changing technologies play such a pivotal role in shaping the environment in which we work, our organization and all its parts must be empowered to move forward at a similar pace in defining ourselves and our purpose.

Advocacy and Changes to Bibliographic Control

The Library of Congress's (LC) spring 2006 series authorities announcement triggered discussion about what role LC should play in the cataloging world as well as what role ALCTS and ALA should play in shaping the future of cataloging. It was clear in analyzing 2006's events that ALCTS was unprepared for the dynamics of cataloging change.

In response to this reality, the ALCTS board commissioned the Cataloging and Classification Section (CCS) Executive Committee to analyze change in the profession, particularly with an eye toward what the association should be doing about it. The resulting studies, "ALCTS and the Future of Bibliographic Control: Challenges, Actions, and Values" and "Overview of the Next Steps Documents Developed by the Association for Library Collections and Technical Services (ALCTS) Sections (Acquisitions, Cataloging and Classification, Collection Management and Development, Preservation and Reformatting, and Serials) and the ALCTS Council of Regional Groups," came to be known generically as the "Next Steps" documents.[1] They served as catalysts for an association-wide discussion of professional advocacy and what steps ALCTS must take to exert a more proactive leadership role in driving professional change. Although many more questions than answers were raised in the course of this discussion, many of the conclusions are being incorporated into the ALCTS strategic plan as tactical initiatives.

Closely related to this analysis of ALCTS leadership roles, the association actively engaged in the work of LC's Working Group on the Future of Bibliographic Control.[2] Two of the working group's three ALA members are ALCTS members (ALCTS councilor Diane Dates Casey and 1997–98 ALCTS president Janet Swan Hill), and the association is providing written testimony for each of the working groups' public hearings.

The revision of the *Anglo-American Cataloguing Rules*, 2nd edition (*AACR2*) has now ceased, and development of an entirely new descriptive analysis and access code, *Resource Description and Access* (*RDA*), has taken its place. This change has come in part in response to a heightened awareness that traditional cataloging codes must be relevant in the rapidly evolving metadata world. In addition to on-going standards development work, ALCTS held two forums to allow membership to keep pace with changes and provide feedback and input. The Cataloging and Classification Section also has taken steps to establish an *RDA* Implementation Task Force.

The Task Force on Non-English Access finished its work and reported its conclusions to the membership. Public comment was received and incorporated into the task force's final report, with eleven recommendations for further action.[3] The task force and its chair, Beth Picknally Camden, are to be commended for their diligent work and their extraordinary, clearly presented call for practical solutions that can be implemented.

Preservation and Digitization

Digital preservation and curation issues now are being actively explored in ALCTS. The new electronic discussion list, DIGIPRES, was launched in February and, as of this writing (May 2007), has nearly one thousand participants around the globe. The list's announcement read in part:

PARS' new discussion list, DIGIPRES, is dedicated to digital preservation and invites you to join. For purposes of clarity, a working definition of digital preservation is included in this invitation: "Digital preservation combines policies, strategies and actions that ensure access to information in digital formats over time." Subscribe to the new list at http://lists.ala.org/wws/info/digipres by clicking on the Subscribe button in the left-hand column.

Serials Section

The Serials Section (SS) voted to change its name to the Serials and E-Resources Section at the 2007 ALA Annual Conference. The Union List of Serials Committee changed its name to "Committee on Holdings Information." It also developed a new charge:

> To address and study matters relating to holding information, with special attention to standards, use, and functionality in the exchange and use of holdings information in and among systems. The committee is further charged with recommending and participating in the development of standards and best practices and with communication and promoting the application and use of these. The Committee's interests include the application of holdings information wherever it appears, including local, group, and union catalogs, and union lists.

2007 Award Recipients

The following awards were presented at the 2007 ALA Annual Conference:

- ALCTS Outstanding Collaboration Citation: CLOCKSS.
- Banks/Harris Preservation Award: Walter Henry (Stanford University Libraries).
- Best of *LRTS*: Jim Stemper (University of Minnesota Libraries) and Susan Barribeau (University of Wisconsin Libraries in Madison).
- Blackwell's Scholarship Award: the late Ross Atkinson.
- CSA/Ulrich's Serials Librarianship Award: Julia Blixrud (Association of Research Libraries).
- Esther J. Piercy Award: Robert L. Bothmann (Minnesota State University, Mankato).
- First Step Award: Paula Webb (Delta State University).
- Leadership in Library Acquisitions: Nancy Gibbs (Duke University).
- Margaret Mann Citation: Robert Wolven (Columbia University).
- Ross Atkinson Lifetime Achievement Award: Brian Schottlaender (University of California, San Diego Libraries).
- Sage Support Staff Travel Grants: Monica Claassen-Wilson (Kansas University), Julia Merkel (James Madison University), Audrey Pryce (Bank Street College of Education), Nancy Slate (Mamie Doud Eisenhower Public Library), LaShawn Wilson (Auburn University), and Siu Min Yu (Rice University).

Looking Ahead

As ALCTS enters its second fifty years, its members find the profession in a period of rapid and dynamic change. ALCTS is committed to exerting leadership through education, dialog and collaboration, publication, standards creation, professional advocacy, and organizational renewal. Our greatest strength lies with our members' creativity and dedication. The future has never been brighter . . . or more uncertain. That said, together we will prevail and flourish.

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1. ALCTS Cataloging and Classification Section Executive Committee, "ALCTS and the Future of Bibliographic Control: Challenges, Actions, and Values" (Oct. 3, 2006), www.ala.org/ala/alctscontent/alctspubsbucket/bibcontrol/NextSteps2006.pdf (accessed May 25, 2007); "Overview of the Next Steps Documents Developed by the Association for Library Collections and Technical Services (ALCTS) Sections (Acquisitions, Cataloging and Classification, Collection Management and Development, Preservation and Reformatting, and Serials) and the ALCTS Council of Regional Groups" (Apr. 12, 2007), www.ala.org/ala/alctscontent/alctspubsbucket/bibcontrol/NextSteps2007.pdf (access May 25, 2007).
2. Library of Congress Task Force on the Future of Bibliographic Control, www.loc.gov/bibliographic-future (accessed May 25, 2007).
3. Task Force on Non-English Access: Report (Sept. 18, 2006, revised March 16, 2007), www.ala.org/ala/alcts/newslinks/currentissues/nonenglishaccess/Non-EnglishReport07.pdf (accessed May 25, 2007).

A Look at Fifty Years of *Library Resources & Technical Services*

By Tschera Harkness Connell

This year, *Library Resources & Technical Services (LRTS)* celebrates fifty years of publication as the official journal representing the collections and technical services interests of American Library Association (ALA) members. During its fifty years, *LRTS* has been highly regarded by the library and information science profession as a scholarly voice for the field.[1] Such an achievement encourages reflection—reflection on who we are, where we have been, and even, perhaps, where we see ourselves going.

LRTS comes from a long tradition, going back even farther than its official beginning. ALA's Resources and Technical Services Division (RTSD) had been formed as a merger in 1956 of ALA's Cataloging and Classification Section and Serials Round Table. Between 1956 and 1957, a section of acquisitions and resources and the Reproduction of Library Materials Section were added to the division.[2] In 1957, the *Journal of Cataloging and Classification,* which had been the official organ of the Division of Cataloging and Classification since 1948, merged with *Serials Slants* to form *LRTS.* The scope of the new journal was defined to reflect the expanded scope of RTSD. Over the years, other changes in scope have occurred as new sections have developed within RTSD: the Resources Section, formed in 1973; and the Preservation of Library Materials, in 1979. In 1991, both the Acquisition Section and the Collection Management and Development Section were founded within the organization.[3] A major change in focus occurred in 1976, when the *RTSD Newsletter* was created to disseminate the news of the division. This action freed the *LRTS* editors to concentrate on advancing scholarship in the field. In 1989, RTSD changed its name to the Association for Library Collections and Technical Services (ALCTS) and the *RTSD Newsletter* became the *ALCTS Newsletter.* In 1991, "a new editorial policy was approved, explicitly stating that research reports were to be included in *LRTS* and that news items were not."[4] Also in 1991, an online version of the newsletter, *ALCTS Newsletter Online (ANO)*, was launched.

Besides this fiftieth anniversary, other milestones in the life of *LRTS* have also spurred analysis. In 1981, on the occasion of *LRTS*'s silver anniversary, Tate, who was editor at the time, looked at gender patterns of authorship, the occupations of authors (for example, academic librarians, public librarians), and the geographic distribution of all papers in terms of their source (for example, the Northeast, Southeast). She also looked at the distribution of papers submitted to *LRTS* over a twelve-month period during 1979 and 1980.[5]

Predicting the future is another way that *LRTS* has celebrated milestones. Williamson wrote an article in 1982, "Is there a catalog in your future? Access to information in the year 2006."[6] The statement from this article that "information seekers may be much more finely tuned to the possibilities available in accessing information . . . a factor to which libraries and information agencies of the future must inevitably respond" accurately predicts our current environment.[7]

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The author gratefully acknowledges the Ohio State University Libraries for their financial support of this project, and Ashley Jones for her assistance in gathering citation data. The author also thanks Fred J. Connell for reading drafts and verifying data during the writing of the paper, and Peggy Johnson, editor of *LRTS,* for her support and patience during its development. The raw data for this paper is deposited in the Knowledge Bank of the Ohio State University (http://hdl.handle.net/1811/28923).

This paper was commissioned in honor of the fiftieth anniversary of the Association for Library Collection and Technical Services.

Williamson's observations are timely for librarians today and were echoed across numerous programs about Google, institutional repositories, digital collections, and possible moves from local catalogs that occurred during the 2007 ALA Midwinter Meeting in Seattle. In 1982, Williamson concluded that:

> I see a catalog in our future, but a catalog which will not be the major focal point in gaining access to information. . . . [L]ibrarians must consider ways and means of developing information services as opposed to providing access to specific collections or particular databases.[8]

Another prediction, Horny's paper, "New Turns for a New Century," was selected for publication in the "Best of 1986 Conference" issue—an issue marking thirty years of *LRTS*.[9] It is interesting to see how on-target some of these twenty-year-old predictions have been. In particular, Horny anticipated the concepts of integrating resources when she stated that "there may be no such thing as a true or fixed edition since the content of time-sensitive texts can be updated continuously."[10] She anticipated purchased bibliographic records from publishers when she predicted that "cataloging . . . may not take place entirely within libraries" and that publishers may provide descriptive and subject cataloging for the materials they publish.[11] She foresaw libraries' collections would increasingly be accessed but not owned.[12]

The most extensive study of *LRTS* was performed by Smiraglia and Leazer on the occasion of its thirty-fifth anniversary. The study was "an attempt to define *LRTS* content over its lifetime and to see whether *LRTS* displays the characteristics of a formal, scholarly communication venue."[13] Based on their literature review of other studies that examined the growth and maturation of professions, Smiraglia and Leazer identified and examined ten indicators of the "scholarliness of material" in *LRTS*.[14] They looked at descriptive measures, such as number of news items, page length, and the number of articles. They examined the proportion of articles that reported research results, the number of citations per article, self-citation rates, and the types of sources cited (for example, books or journals). They also looked at the proportion of articles produced through the collaboration of one or more authors and whether the proportion increased over time. Based on their analysis they concluded that "*LRTS* . . . reflects the growth of a maturing, scholarly discipline surrounding the orientation paradigms that ALCTS exists to serve."[15]

Other journals also have marked milestones by examining the content of a particular journal. Lipetz's 1999 examination of fifty years of the *Journal of the American Society for Information Science (JASIS)* is one example.[16] Using a sample, Lipetz's study concentrated on authorship. He looked at author addresses (United States versus residences in other countries), collaboration, productivity, gender, and affiliation. Of the several conclusions that Lipetz makes, two have particular relevance to the present study. He concludes that "information science . . . is a developing discipline . . . with an expanding body of authors" and notes that representation of female authors is growing.[17]

In this paper I have taken a broad view of the historical development of *LRTS*, leaving the crystal ball gazing to others. The entire fifty years were examined in terms of trends in content and authorships over the years. What are the types of documents appearing in *LRTS*, and have the proportions of these types changed over time? What are the subjects discussed by the authors of *LRTS*? Has the emphasis on different topics changed over time? From what perspective have these topics been discussed? For example, have the topics been discussed in terms of theory, administration and practice, budgeting, education? Which journals have been most cited by *LRTS* authors? (Or, stated differently, to which journals do *LRTS* authors owe an intellectual debt?) Which journals cite *LRTS*?

Patterns of authorship also were examined. How many authors have contributed to the content of *LRTS*? What percentage wrote multiple articles? What percentage of articles is written in collaboration with one or more authors? Does this percentage change over time? Have there been differences in the proportion of contributions by gender, and has this changed over time? And finally, are authors grateful for the assistance and support they receive from others? Or, at least, do they express their gratitude in the form of explicit acknowledgements?

Method

LRTS has been published quarterly since its inception. All issues from volume 1, number 1 (1957) to volume 50, number 4 (2006) were examined. For each issue, the date and editor were noted. For each document (defined as any titled content unit) within the issue, the author(s), the document title, and the titles of all journals cited, and the number of citations to each of those journals were recorded. Also recorded was whether the author(s) acknowledged the contributions of others. Many forms of acknowledgement—including, for example, joint authorship—are possible. For this study, explicit statements of gratitude are the indicators of acknowledgment. For articles, literature surveys, and papers, the gender of the first author was noted. (The distinction—for the purposes of this study—between an article and a paper is that a paper was given first as a presentation prior to its publication in *LRTS*.)

Content was characterized by type of document: announcement, article, biography or tribute, bibliography, column, correction, editorial, guide, introductory comments, letters to the editor, literature surveys, list of refer-

ees, necrology, news brief, poem, paper, report (of a unit of RTSD/ALCTS or of an external organization), or review.

Each document also was assigned one or more subject headings based on an ALCTS section, committee, or interest group. These subject headings were derived from the 2006 *ALA Handbook of Organization*.[18] If the content warranted it, documents may have been assigned subject headings matching multiple ALCTS units. For example, if the topic of an article was working with serials vendors, the article would be assigned the subject headings "Acquisitions—Vendors" and "Serials—Acquisition." Some of the subjects covered in documents were broader than the scope of the sections of ALCTS. For these, three additional subject headings were defined: Library Services (for articles about library services in general, not just technical services); Technical Services (for articles addressing the technical services broadly); and Publishers/Publishing (for articles focusing on publisher and publishing issues). In addition, entries may have been assigned subheadings indicating a particular perspective on the topic (e.g., administration and management, education, standards), type of library, or type of resource (e.g., archival materials, scores, sound recordings). Figures 1 and 2 provide a complete list of subject headings used.

A large part of this study is an analysis of citation data. As a way of noting sources of *LRTS*'s intellectual debt, the journals cited and the number of citations to each was recorded for each article, paper, and literature review. In addition, citations to *LRTS* as reported in the ISI World of Science were analyzed to show the breadth of *LRTS* contributions. These citations were gathered on January 1, 2006, and covered citations to *LRTS* from 1980 through 2005. For citations appearing in *LRTS* and citations to *LRTS*, journals were grouped by the latest name of the journal. For example, if an author cited *Serials Slants* once, *Journal of Cataloging and Classification* once, and *LRTS* once, the data would be reported as citing *LRTS* three times, as *Serials Slants* and *Journal of Cataloging and Classification* merged in 1957 to form *LRTS*. See appendix A for a list of journals that have been grouped by latest title.

Note that for citations, only citations appearing at the end of articles were counted. This eliminated citations from volume 1, which were recorded in the text of articles and papers.

Analysis

For the purpose of analysis, the fifty years of data were broken into five equal time periods based on the volume numbering of *LRTS*. These time periods will be referred to as decades for ease of discussion: the first decade, 1957–1966 (volumes 1–10), the second decade, 1967–1976 (volumes 11–20), and so forth.

Overview of Types of Documents Appearing in *LRTS*

Over the full span of fifty years there were 1,182 articles, 186 literature surveys, and 197 papers published in *LRTS*. For the first two decades, the average number of articles and papers per issue was 36 and 31 respectively. By the fourth and fifth decades, the average had dropped to 25 and 20 respectively.

Columns (excluding columns for book reviews, which are counted separately) have never been a big part of *LRTS*. Only five regular columns have been identified, and all appear for short periods of time during the first thirty-five years. During the first decade, two columns appeared briefly: Marian Sanner's column "Studies and Surveys in Progress" appeared in eight issues between 1959 and 1961, and Hubbard Ballou wrote a column, "Copying Method Notes," that appeared for three issues in 1964. "ERIC/CLIS (Education Resources Information Center Clearing House on Library and Information Science) Abstracts" appeared in four issues during 1973 and 1974. The most recent column to appear was the column by Verna Urbanski titled "Resources and Technical Services News," which ran for seven issues in 1988 and 1989. This column addressed a broad range of topics, including "CD-ROMs Take Center Stage," "The Library As Publisher," and "New Developments in the Preservation World." The longest-running column was the news from the Council of Regional Groups, which ran for fourteen years (1957–1970).

Reviews have appeared in 167 of the 200 issues of *LRTS*. In the first ten to fifteen years, reviews included individual article, equipment and processes, and vendor and services reviews as well as the annual literature surveys and book reviews. An example of an early equipment and processes review is Peter Scott's 1959 review, "The Miraculous Bubble: A Look at Kalfax Microfilm." In the early years, there also were review articles comparing books, equipment, or vendors. An example is Samuel T. Walter's 1958 evaluation, "The Red and the Green," which reviewed two 1949 cataloging codes, *ALA Rules for Author and Title Entry* (red book) and *LC Rules for Description* (green book). The data in table 1 show the types of reviews that have appeared. The numbers represent the number of issues having a particular type of review. The first decade is the only decade that book reviews appeared in every issue. Twelve issues in the first decade had reviews for individual articles. This service was unique to the first editor of *LRTS*, Esther J. Piercy. From time to time, she wrote a column, "Editor Recommends," in which she reviewed an article or articles from other journals that she judged worthy of further discussion.

The presence of editorials is an indicator of an editor's style. The early editors wrote few editorials. Esther Piercy wrote only five during her eleven years of tenure as editor of *LRTS*. Together Paul S. Duncan, Robert Wedgeworth, and Wesley Simonton wrote eight editorials during their

combined eleven-year tenure (volumes 12–23, number 3). The last three decades have shown an increase in editorials (twelve, seventeen, and eighteen respectively), but in no decade do editorials appear in even 50 percent of the issues.

Using the number of issues containing letters to the editor as the measure, *LRTS* has been a vibrant journal over the years. In all but the last decade, more than 50 percent of the issues have contained letters to the editor. The second decade shows the most active readership, with 39 of the 40 issues (97.5 percent) containing letters to the editor. Twenty-one issues (52.5 percent) had letters to the editor during the first decade. The third and fourth decade had reader letters in 25 (62.5 percent) and 26 (65 percent) issues, respectively. The fifth decade had the fewest instances of reader letters, with only 10 (25 percent) issues containing letters to the editor.

Announcements and reports were numerous in the earlier years of *LRTS* before the *RTSD Newsletter* was created in 1976 to cover division news. The 1989 change in policy to make *LRTS* less of an organ of the institution and more of a scholarly journal is reflected in the makeup of the contents. Ninety-three percent (440 of 474) of all the announcements and 86 percent (287 of 332) of all the reports that have been published in *LRTS* were published in the first three decades prior to the policy change.

The number of necrologies has been fairly consistent, with approximately ten appearing every decade. Again, the fewest number (four) appeared in the last decade. Whether this is a result of editorial policy or a drop in the number of "notable" deaths has not been determined!

Subject Content: Fifty-Year View

As previously described, documents were assigned one or more top-level topical subject headings matching the names of ALCTS sections, committees, or interest groups, or, if appropriate, one or more broader headings—or both (see figure 1). In addition, subheadings reflecting a particular perspective (for example, administration and management, costs, standards, or use), type of library, or type of resource were assigned as appropriate (see figure 2). Topical subject headings were assigned primarily to articles, literature surveys, and papers. Subject headings were assigned to announcements and reports only if the documents were not

ALCTS Sections	Section Committees/ Interest Groups	Section-Specific Headings
Acquisitions	Gifts and Exchange	
	Materials (by audience)	
	Materials (by geography)	
	Vendors	
Cataloging and Classification	Authority control	Bibliographic records
	Classification	Catalogs (Book, Card, Classified, Computerized, Divided, Online)
	Copy cataloging	Codes
	Description and Access	Filing
	Materials (by audience)	Indexing
	Materials (by geography)	Production
	Subject Analysis	Shelving
		Standards development
		Subject headings
Collections	Collection Development	
	Evaluation	Circulation
		Interlibrary loan
		Use
Preservation/Reformatting	Binding	
	Conservation	
	Micropublishers	
	Treatment of materials	
	Metadata	
	Recording and Photographic Media	
	Reformatting, Analog	
	Reformatting, Digital	
Serials	Acquisition	Accompanying materials
	Union Lists	Holdings
	Journal costs	

Broad Subject Headings

Library Services (general, not limited to technical services)

Publishers/Publishing

Technical Services

*Except for three broad headings, headings are based on the ALCTS organizational structure

Figure 1. Top level subject headings* assigned

focused on the administrative concerns of RTSD or ALCTS. For example, "Preservation/Reformatting—Standards" was assigned to a 1974 ANSI Subcommittee 35 report on the *Draft Standard for the Advertising of Micropublications,* but no heading was assigned to the Reproduction of Library Materials Section report that appeared the same year. Letters to the editor addressing issues raised in a particular article were assigned the same subject headings(s) as the article. Other types of documents, such as announcements of grants received, editorials, most letters to the editor, necrologies, and book review sections covering books on a variety of topics, were not assigned subject headings.

Overall, there were 2,024 subject heading strings assigned to 1,785 documents. The data in table 2 show that in the cases of subject headings assignment, a little more than half (1046 or 51.7 percent) of the topical content of *LRTS* has been about cataloging and classification. This is a little less than the 54.8 percent reported by Smiraglia and Leazer's analysis of thirty-five years of *LRTS*.[19] The subject headings matching the other four sections of ALCTS represent only a total of 36.8 percent (744 of 2024) of the content of the 1,785 documents. The three broad subject headings were assigned 11.6 percent (234) of the time.

Because of the size and complexity of the administrative structure of the Cataloging and Classification Section, the subject headings also were complex. The breakdown of the cataloging and classification literature is presented separately in table 3. Note that this table does not have all the subheadings representing section committees and interest groups, specific topics, and perspectives shown in figure 1 and 2. In table 3 a subject heading is shown with subheadings if the number of documents assigned to the top-level heading was large enough that further breakdown seemed beneficial to understanding the data.

"Classification" and "Description and Access" were the most frequent cataloging and classification topics addressed, together accounting for 43.9 percent (459 of 1,046) of all the articles on cataloging. Most of the articles discussing classification concentrated on the Dewey Decimal Classification (DDC) and the Library of Congress Classification System (LCCS), but there also were articles on the Bliss, Colon (Ranganathan), Expansive (Cutter), International (Rider), and Universal Decimal (UDC) classifications. A pervasive subtopic of description and access is description and access of specific types of materials, such as archival materials, court materials, e-resources, non-English language materials, nonbook materials, scores, screenplays, and serials. During the development of *AACR* and *AACR2* (roughly the first three decades of *LRTS*), many of the articles that focused on description and access dealt with codes and code revision. Theoretical, practical, and political aspects of the new codes were discussed.

Similarly, catalogs have been a frequent topic during the first three decades of *LRTS*. Book catalogs have received the most press, but other forms, such as Computer Output Microform (COM) and card and online catalogs, have been discussed. Not unlike today's discussions on screen design, librarians wrestled with issues of data arrangement in the analog world. There are articles proposing, evaluating, and testifying for dictionary, divided, and classified catalog arrangements.

Returning to table 2, nearly half of the documents about collections (117 of 241, or 48.5 percent) focused on collection development. Of these, about a third (41 of 117) focused on the administration of

Perspective	Subheadings Assigned
General	Administration/Management, Budget, Cooperative Programs, Costs, Education, Employment, Equipment/Services, Evaluation, Governance, Implementation, Leadership, Policy, Research/Statistics, Standards, Technology, Use
Types of libraries (used as main heading only if focus is not technical services)	Two-year academic, Four-year academic, Archives/Manuscript collections, Public libraries, Research libraries, School libraries/media centers, Special libraries
Types of resources	Archival materials, Exhibition catalogs, Foreign materials, Government documents, Maps, Manuscripts, Scores, Serials, Sound recordings, Special collections

Figure 2. Subject subheadings representing perspective assigned

Table 1. Number of *LRTS* issues containing one or more types of reviews

	Reviews				
	Literature Surveys	Individual Articles	Books	Equipment/ Processes	Vendors/ Services
vols. 1–10	11	12	40	5	1
vols. 11–20	11	0	32	0	0
vols. 21–30	14	1	5	0	0
vols. 31–40	10	0	36	0	0
vols. 41–50	7	0	35	0	0
Total	53	13	148	5	1

collection development. Collecting specific types of materials accounted for 23.1 percent (27 of 117) of collections articles. Specific types of materials addressed included adult fiction, business resources, folk songs, Internet resources, Near Eastern resources, and audio-visual.

Other collections topics included issues related to the use and management of the collections themselves. Management topics, including budgeting, cooperative programs, evaluation, and technology, accounted for nearly a third (30.2 percent or 73 of 241) of all collections topics. The management of specific types of collections (for example, art collections, music libraries, and children's collections) made up 11.6 percent (28 of 241) of the collections documents. Collection use, circulation, and interlibrary loan accounted for 9.5 percent (23 of 241) of the collections documents.

Many of the acquisitions documents (83 of 198 or 41.9 percent) have dealt with the challenges of acquiring foreign materials and nonbook formats. Documents discussed acquiring materials from Canada, East Germany, Mexico, Nigeria, and Russia. Exchange programs as a means of obtaining hard-to-acquire materials were an important topic of the early decades of articles on acquisition. Documents addressing the issues of obtaining formats included art, ephemera, government documents, musical scores, software, and technical reports. Other acquisitions topics included vendor evaluation and general administration and management topics.

The focus of preservation and reformatting topics primarily was analog reformatting; specifically, microforms. These documents accounted for 54.1 percent (93 of 172) of all the documents on preservation and reformatting. General topics, such as administration, coopera-

Table 2. Distribution of subject headings assigned to 1,785 documents

Descriptors	No. of Times Descriptor Assigned	% of Times Descriptor Assigned
Cataloging and Classification*	1046	51.7
Collections*	241	11.9
Acquisitions*	198	9.8
Preservation/Reformatting*	172	8.5
Technical Services	147	7.3
Serials*	133	6.6
Library Services	60	3.0
Publishers/Publishing	27	1.3
Total	2,024	100.0

*Headings correspond to sections of ALCTS

Table 3. Distribution of specific "Cataloging and Classification" descriptors assigned (*N*=1,046)

ALCTS Section	Committee/interest Group	Specific Topic	No.	% of Total
Cataloging and Classification	General		211	20.2
	Authority Control		42	4.0
	Bibliographic records		89	8.5
	Catalogs	General	40	
		Book	32	
		Card	5	
		Online	25	
		Other (e.g., COM)	5	
		Dictionary/Divided/ Classified	25	
	Total—Catalogs		132	12.6
	Classification	General	69	
		DDC	78	
		LCC	31	
		Other (e.g., Bliss)	21	
		Shelving	12	
	Total—Classification		211	20.2
	Description and Access	General	173	
		Codes	75	
	Total—Description and Access		248	23.7
	Subject analysis	General	27	
		Indexing	8	
		Subject headings	78	
	Total—Subject analysis		113	10.8
Total—Cataloging and Classification			1,046	100.0

tive programs, and education for preservation and reformatting professionals, accounted for another 36.1 percent (62 of 172). Other topics have included binding and the treatment of materials for preservation.

Over the years, there have been 133 documents on serials. The greatest discussion of serials appeared in the first decade, with nearly 34 percent (45 of 133 articles) on this topic. Forty-two (31.6 percent) of serials articles appeared in the fourth decade (volumes 31–40). In the both of these decades, the emphasis of serials documents was on administration and management, particularly issues dealing with technology. An example of an early serials technology article is a 1966 article by William McGrath titled "A Simple, Mechanized, Non-Computerized System for Serials Control in Small Academic Libraries: A Primer." The more sophisticated technology of the fourth decade is shown in the 1990 article "Serials, Links, and Technology: An Overview" by Tom Delsey.

Subject Content—Shifts across Decades

Figure 3 shows the proportion of each of the five ALCTS section topics and three broad subjects (combined and treated as one) for each of the five decades. Cataloging and classification has always been the most prevalent topic, averaging 52 percent of the content. During the first three decades, 60 percent or more of the content was cataloging and classification. In the last two decades, however, cataloging content has dropped to around 50 percent. In contrast, the percentage of content addressing collections issues is increasing. During the first two decades, collection topics made up 7 percent (34 of 459) and 8 percent (33 of 433), respectively, of *LRTS*. During the third and fourth decades, collections topics made up 17 percent of *LRTS*. By the last decade, collections made up 26 percent (65 of 252) of *LRTS*.

The largest proportion of acquisitions topics occurred during the second and third decades, with 14 percent (64 of 459) and 15 percent (64 of 433), respectively. The second decade (1967–1976) was a time of relative prosperity in libraries; librarians were looking for ways to build collections. The third decade (1977–1986) was a time of extensive automation development; many of the articles dealt with requirements and shared experiences for automating acquisitions.

Preservation reached a high of 15 percent (47 of 315) during the third decade, with discussions of photocopying, microform preservation standards, and equipment. Serials reached a high of 13 percent (42 of 331) during the fourth decade, with articles discussing holdings, linking standards, and serials automation. The lowest proportions for any ALCTS section topic during any decade occurred in the third decade, when serials accounted for only 3 percent (10 of 315) and acquisitions accounted for only 5 percent (16 of 315) of the content.

An analysis of two of the three broad topics, "Library Services (Public and Technical)" and "Publishers/Publishing"

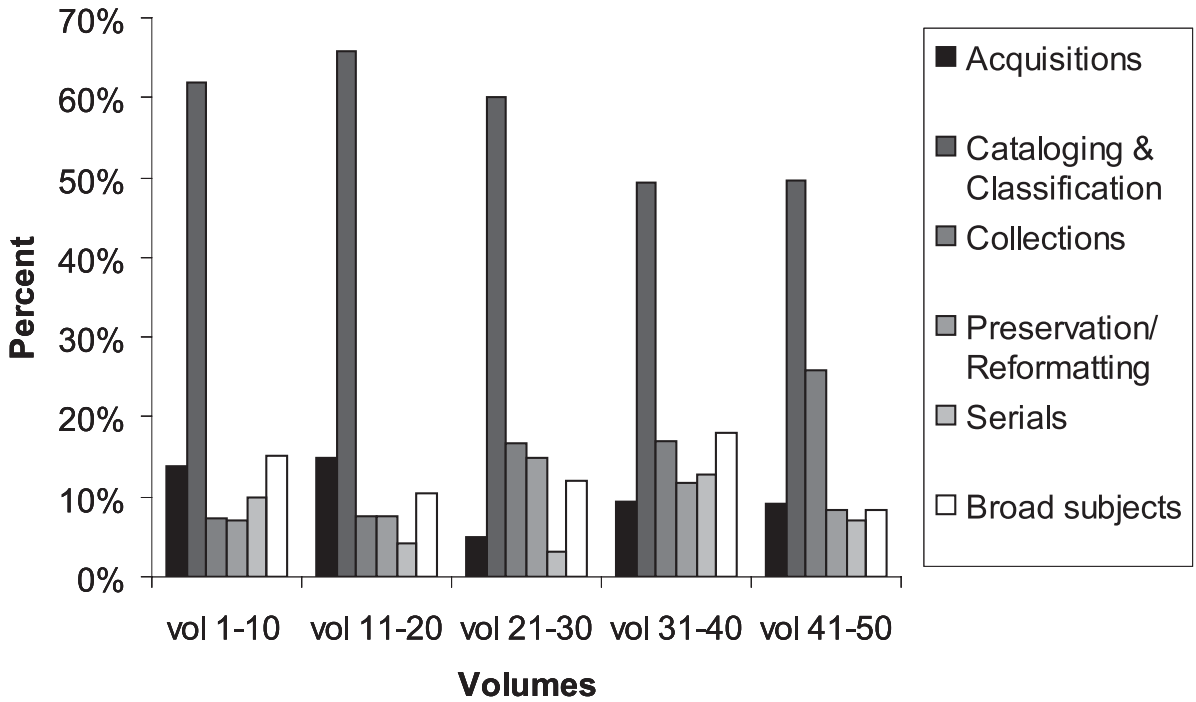

Figure 3. Topics by decade with percent of content

shows little variation over the decades. Publishers/Publishing documents hovered around 2 percent for four of the five decades. The exception is in the first decade (1957–1966), when only 0.8 percent of the documents addressed issues of publishing. Documents addressing library services range from a low of 0.9 percent during the first decade to 5.4 percent in the fourth decade, with the average at 1.5 percent. As one would expect given the focus of ALCTS, the largest number of broad topic documents addressed general technical services. The high was during the first decade, with 11.5 percent of the documents on technical services in general; the low was during the fifth decade, with 1.8 percent; the average, 6.6 percent.

Citations from *LRTS* to Other Journals

Beginning with this section, the discussion will be limited to three types of documents: articles, literature surveys, and papers. During the first fifty years, the authors of these three types of documents have cited 958 journals. (A reminder: In this study, a journal that has changed title over the years is counted as a single title.) During the fifty years, 1,554 articles, literature surveys, and papers have yielded 15,631 citations, for an average of 10.1 citations per article, literature survey, or paper.

The averages are 6.2 citations per article (7,303 citations in 1,182 articles), 42.8 citations per literature survey (7,870 in 184), and 2.4 citations per paper (458 in 188). For all of these types of contributions, the average number of citations steadily increased with each decade. Articles published in the first decade averaged only 2.0 citations per article; the articles published in the fourth and fifth decades averaged 9.4 and 9.5 citations respectively. Literature surveys averaged 7.9 citations in the first decade; by the fourth and fifth decades the average was 89.3 and 85.4 respectively. In comparison, papers have relatively few citations. The average in the first decade was 2.4 per paper; for the fifth decade the average was 5.6 per paper.

Citations from *LRTS* were examined in two groups. The first group is the citations for literature surveys. The second group is citations for articles and papers. Literature surveys were grouped separately because, by definition, the literature surveys are intended to examine all the literature related to a particular topic over a specific time period. As will be seen, the citing behavior of authors of literature surveys differs from the citing behavior of authors of articles and papers.

Journals for both groups were listed in descending order by number of times they were cited. The twenty-five most cited journals for the fifty years overall and for each decade are shown in appendix B. Fourteen titles appear in the top twenty-five for both groups. The eight most cited titles in literature surveys appear in the top twenty-five for articles and papers. The nine most cited journals in articles and papers appear in the top twenty-five for literature surveys. *LRTS* and *College & Research Libraries* are at the top two in both groups, but in different order.

LRTS is the most cited journal by the authors of articles and papers for the last four decades. *Kentucky Libraries* is the most cited journal by authors of articles and papers for the first decade. Interestingly, during the first decade, *LRTS* is ranked fifth, with about one-third of the number of citations received by *Kentucky Libraries. College & Research Libraries,* the *Journal of the American Society for Information Science and Technology,* and *Know* were the other journals ranking higher than *LRTS.* The fact that *LRTS* ranks fifth is not due to the fact that *LRTS* was a "new" journal during its first decade—*LRTS* was formed by a merger of *Serials Slants* and the *Journal of Cataloging and Classification*. However, in considering these data, it is worth restating that in-text citations were not counted. This methodological decision affects only data from the first decade. Articles in several early issues of *LRTS* used footnotes or full in-text citations instead of a list of citations at the end of an article, as is common practice today. Without going back and counting the in-text citations, one cannot know if the rank order of titles cited would change were they counted. However, there is no reason to believe that in-text citations would change the ranking of any title over another.

The data in tables 4 and 5 show journals that have appeared for three or more decades in the list of twenty-five most frequently cited by *LRTS* authors. Table 4 shows the most consistently cited journals by authors of literature reviews. Table 5 shows the most consistently cited journals by authors of articles and papers. Eleven journals appear on both lists. Table 4 contains three journals that are missing from table 5: *Inform, Microform and Imaging Review,* and *International Cataloguing and Bibliographic Control.* Interestingly, *Inform* never appears higher than 44th in rank for articles and papers, and *Microform and Imaging Review* never appears higher than 35th. Table 5 contains five journals that are missing from table 4: *Journal of Documentation, ALCTS Newsletter, Library Quarterly, Library Trends,* and *Wilson Library Bulletin.* The highest proportional rank that *Journal of Documentation* obtains for surveys is 43rd; the highest for the *ALCTS Newsletter* by *LRTS* authors is 53rd, and the highest for *Wilson Library Bulletin* is 167th. These results seem to indicate that the journals cited frequently for articles and papers also are cited frequently for literature surveys, although a few specific titles are more frequently cited by one group of authors than by the other.

Journals Citing *LRTS*

A list of journals whose authors cited *LRTS* between 1980 and 2005 was compiled from the ISI Web of Science. This

Table 4. Literature surveys: journals appearing in top 25 most frequently cited journals by *LRTS* authors for three or more decades

Journal Title	No. Decades Ranked in Top	vols. 1–10	vols. 11–20	vols. 21–30	vols. 31–40	vols. 41–50
College & Research Libraries	5	x	x	x	x	x
LRTS	5	x	x	x	x	x
American Libraries	4		x	x	x	x
Inform	4	x	x	x	x	
Information Technology and Libraries	4		x	x	x	x
Library Journal	4	x	x	x	x	
Microform and Imaging Review	4		x	x	x	x
Collection Management	3			x	x	x
International Cataloguing and Bibliographic Control	3		x	x		x
Journal of Academic Librarianship	3			x	x	x
Journal of the American Society for Information Science and Technology	3	x	x	x		
Library Collections, Acquisitions & Technical Services	3			x	x	x
Library of Congress Information Bulletin	3		x	x	x	
Serials Librarian	3			x	x	x

Table 5. Articles and papers: journals appearing in top 25 most frequently cited journals by *LRTS* authors for three or more decades

Journal Title	No. Decades Ranked in Top	vols. 1–10	vols. 11–20	vols. 21–30	vols. 31–40	vols. 41–50
American Libraries	5	x	x	x	x	x
College & Research Libraries	5	x	x	x	x	x
Journal of the American Society for Information Science and Technology	5	x	x	x	x	x
LRTS	5	x	x	x	x	x
Information Technology and Libraries	4		x	x	x	x
Journal of Documentation	4	x	x	x		x
Library Journal	4		x	x	x	x
ALCTS Newsletter	3			x	x	x
Collection Management	3			x	x	x
Journal of Academic Librarianship	3			x	x	x
Library Collections, Acquisitions & Technical Services	3			x	x	x
Library of Congress Information Bulletin	3		x	x	x	
Library Quarterly	3		x	x	x	
Library Trends	3		x	x		x
Serials Librarian	3			x	x	x
Wilson Library Bulletin	3		x		x	x

list was compared with the list of journal titles cited by *LRTS* authors for the third through fifth decades (1977–2006). These three decades were chosen for comparison because they most align with the years of data available from the Web of Science. Comparative lists of the top twenty-five journals from both groups are shown in table 6.

The rank order of titles on the Web of Science list confirms the earlier analysis that *LRTS* authors cite *LRTS* more than any other source (that is, *LRTS* is number one on both lists). Other than that similarity, however, the two lists have very little in common. Only nine titles appear in the top twenty-five for both. Thirty-two titles are unique. Other than self-citation (that is, *LRTS* citing *LRTS*), the journals to which *LRTS* authors look as sources of information appear not to be the same journals that rely on *LRTS*.

Authorship

In the analysis of the authorship data, no attempt was made to collocate documents under one name for people whose names had changed. With that caveat stated, 1,350 different authors contributed 1554 articles, papers, and literature surveys during the fifty years.

Approximately 79 percent of the authors (1,064 of 1,350) have contributed one document (article, literature survey, or paper) during the fifty years.

Nearly 13 percent (172 of 1350) contributed two. Only 0.4 percent contributed more than ten documents. This group is comprised of two authors with thirteen contributions (Lois Mai Chan and Paul S. Dunkin), one author with twelve (Allen B. Veaner), and three with ten (Ross W. Atkinson, Richard M. Dougherty, and Phyllis A. Richmond). Others have made notable contributions to *LRTS* in addition to the contributions of articles, literature surveys, and papers. Edward Swanson has indexed *LRTS* for twenty-seven of its fifty years—that is twenty-seven contributions, not counting cumulative indexes that also have been prepared.

No author attribution was provided for 16 of the 1,182 articles appearing in *LRTS*. Of the remaining 1,166, 910 were authored by one person and 256 were authored by two or more. A comparison of single and multiple authorship over the years shows a steady increase in the proportion of multiple authors. Figure 4 illustrates this trend.

The effort to determine the gender of the first author of the 1,554 articles, literature surveys, and papers identified 797 men and 655 women. Twenty documents had no author attribution, and the gender of eighty-two first authors was not determined. The contributions of men and women are fairly equal during the entire fifty years. Of the 1,452 documents for which gender of first author was determined, men contributed 55 percent (797 of 1,452), and women 45 percent (655 of 1,492). However, breaking down the data by decade and by type of document reveals some differences in the number of contributions by gender. Grouping all types of documents, men contributed in greater proportion for the first two decades, women for the last two. In the third decade (volumes 21–30, 1977–1986), the number of contributions for men and women is similar (males 149; females 132).

Figure 5 shows that the pattern is nearly identical to the overall pattern when articles are considered alone. Men predominated in the first two decades, women in the last two, and the contributions are fairly equal during the third (53 articles by men; 47 by women).

Figure 6 shows that literature surveys were written more frequently by men in the first two decades. However, literature surveys by women are greater in number for the last thirty years. Note that the last decade has only six literature surveys total, one contributed by a men and five by women.

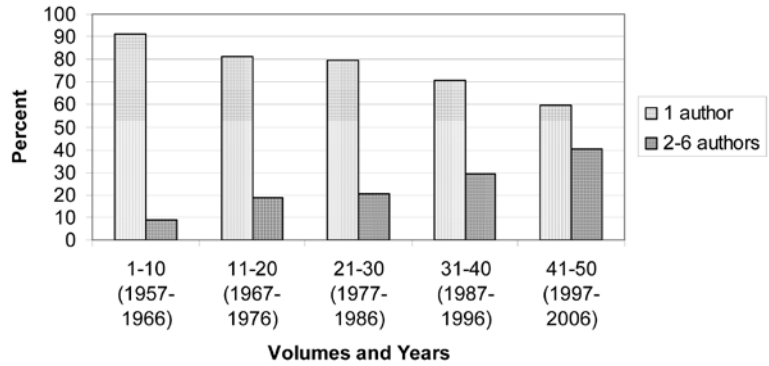

Figure 4. Article authorship comparison: percentage contribution by single and multiple authors

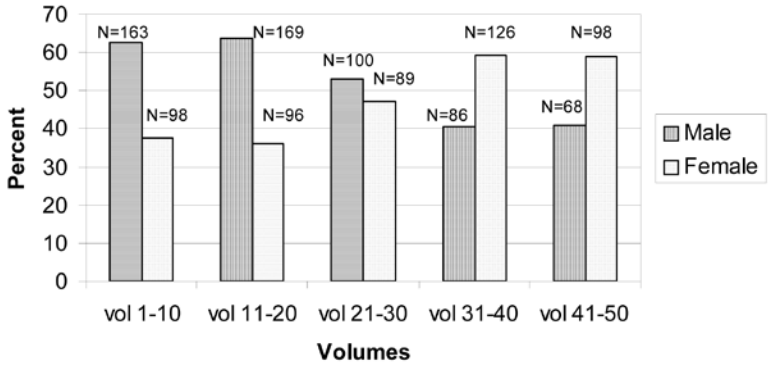

Figure 5. Articles: contributions by gender over time

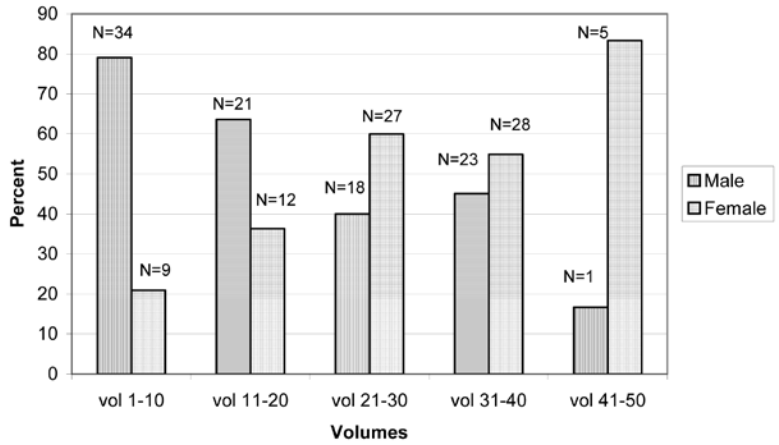

Figure 6. Literature surveys: contributions by gender over time

Figure 7 shows that men published the most papers in all decades except the fourth (1987–1996), when women first-author papers numbered fourteen and male first-author papers numbered ten.

One additional observation about *LRTS* authors. Are we grateful for the assistance and support we receive from others? Or do we at least express our gratitude in the form of explicit acknowledgements? The answer is, not really. In fifty years, only 14 percent (161 of 1,182) of the articles include acknowledgements. An examination of the data may indicate, however, a cultural shift toward acknowledging others. In the first decade, only 1 percent (6 of 289) of the articles

Table 6. Comparison of the 25 journals that most frequently cited *LRTS* and the 25 journals most frequently cited by *LRTS*

Journals Citing *LRTS* 1980–2005 (Data from ISI Web of Science)	No. Citations	Journals Cited by *LRTS* 1977–2005 (Includes citations from all articles, literature surveys, and papers)	No. Citations
1 *Library Resources & Technical Services*	647	**1** *Library Resources & Technical Services*	1,272
2 *College and Research Libraries*	127	**2** *Library Collections, Acquisitions & Technical Services*	667
3 *Library Collections, Acquisitions & Technical Services*	118	**3** *College & Research Libraries*	594
4 *Journal of the American Society for Information Science and Technology*	100	**4** *Serials Librarian*	566
5 *Library Trends*	94	**5** *Library Journal*	552
6 *Journal of Academic Librarianship*	91	**6** *Cataloging & Classification Quarterly*	515
7 *Information Technology and Libraries*	59	**7** *Journal of Academic Librarianship*	410
8 *Serials Librarian*	51	**8** *Information Technology and Libraries*	382
9 *Journal of Documentation*	41	**9** *American Libraries*	368
10 *Library and Information Science Research*	37	**10** *Serials Review*	362
11 *Library Quarterly*	35	**11** *Library of Congress Information Bulletin*	301
12 *Libri*	35	**12** *Journal of the American Society for Information Science and Technology*	289
13 *Journal of the Medical Library Association*	32	**13** *Collection Management*	243
14 *Knowledge Organization: KO*	28	**14** *Microform and Imaging Review*	238
15 *Information Processing and Management*	26	**15** *Inform*	103
16 *Electronic Library*	22	**16** *ALCTS Newsletter*	198
17 *Journal of Librarianship and Information Science*	19	**17** *Collection Management*	172
18 *Canadian Journal of Information and Library Science*	18	**18** *Library Quarterly*	162
19 *Interlending and Document Supply: The Journal of the British Library Lending Division*	16	**19** *International Cataloguing and Bibliographic Control*	153
20 *American Archivist*	14	**19** *Library Trends*	153
20 *Portal: Libraries and the Academy*	14	**21** *Abbey Newsletter*	150
22 *Science and Technology Libraries*	12	**21** *Technical Services Quarterly*	150
22 *Zeitschrift Für Bibliothekswesen Und Bibliographie*	12	**23** *Conservation Administration News*	149
24 *Journal of Education for Library and Information Science*	10	**24** *Cataloging Service Bulletin*	147
24 *Law Library Journal*	10	**25** *College & Research Libraries News*	144
24 *Notes*	10		
24 *RQ*	10		

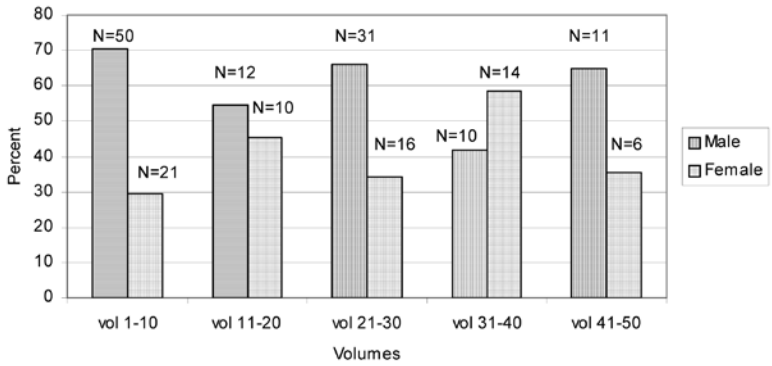

Figure 7. Papers: contributions by gender over time

included acknowledgments. The numbers have generally increased since then. During the second decade, 5 percent (16 of 289) included acknowledgements; the third decade, 14 percent (35 of 200); the fourth decade, 31 percent (74 of 226); and for the fifth decade, 25 percent (49 of 178).

Summary and Conclusions

This analysis of *LRTS* content over time has provided a mirror of librarianship over the last fifty years. Early on, *LRTS* was used as a communication tool for association news, reports, and participation opportunities as well as a venue for advances in practice and scholarship. During the second half of its history, *LRTS* has increasingly become a vehicle for the dissemination of new knowledge and scholarship about librarianship. The content of the first three decades was primarily focused on cataloging and classification issues, specifically code revision and library catalogs. During the migration from card, book, and microform catalogs to integrated online systems, this content is not surprising. Much of our efforts during the 1960s and 1970s were directed toward that migration. As well, the philosophical and theoretical shift from case-based cataloging to the Anglo-American cataloging codes is reflected in the pages of *LRTS*. Once the decision was made to adopt the new approach, librarians were faced with the practical question of how. Cataloging and classification articles still make up the majority on the content, but the proportion is decreasing. Slightly more than half (51.7 percent) of the content during the last decade has been devoted to cataloging and classification. Documents addressing issues related to collections, collection development, management, budgeting, automation, and standards are increasing. Collections topics have steadily grown, from 7 percent of the *LRTS* content during the first decade, to 26 percent during the fifth.

Citations from *LRTS* to other journals were examined as a way of understanding our intellectual debt to other scholarly sources. The citation patterns of *LRTS* articles and papers to other journals were different from the citation patterns of literature reviews. There was quite a bit of overlap; however, some journals cited in literature surveys are not cited in articles and papers and vice versa.

Comparing Web of Science data of citations to *LRTS* with citations from *LRTS* to other journals revealed that the journals cited by *LRTS* are not the same journals citing *LRTS*: only nine titles appeared in the most frequently cited journals in both lists.

These data suggest evidence that patterns of authorship are changing. Seventy-eight percent of the articles, literature surveys, and papers were written by a single author, but multiple authorship is increasing. Overall, the contributions of men and women have been fairly equal. However, looking at the data decade by decade shows a changing pattern. Men have contributed more during the first twenty years, women the last twenty years. The third decade contributions are relatively equal. The frequency with which authors explicitly acknowledge the contributions of others in the creation of the article is increasing—we are becoming more openly grateful.

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Appendix A. List of Journals that Grouped under a Single Title: Includes Journals that Changed Names and Journals Cited by Variant Names
(older names or variations appear in parentheses)

AB Bookman's Weekly (Antiquarian Bookman)
Academe: Bulletin of the AAUP (AAUP Bulletin)
Advances in Serials Management (Serials Management)
Agricultural Libraries Information Notes (Agricultural Libraries)
ALA Washington Newsletter (Washington Newsletter)
ALCTS Newsletter
American Libraries (ALA Bulletin; Bulletin of the American Library Association; Public Libraries)
Annual Review of Information Science and Technology (ARIST)
Annual Review of OCLC Research (OCLC Research Review)
ARL: A Bimonthly Newsletter of Research Library Issues and Actions (ARL Libraries)
ARMA Records Management Quarterly (ARMA Management Quarterly; ARMA Quarterly)
Art Documentation: Bulletin of the Art Libraries Society of North America (ARLIS/NA Newsletter)
Aslib Information (Aslib)
ASLP (Bulletin [Association of Special Libraries of Philippines Bulletin])
Assistant Librarian (Library Assistant)
Audiovisual Librarian (Audio Visual Librarian)
Australian Library Journal (Riverina Library Review)
Biblioteka (Moscow, Russia) (Bibliotekar' [USSR])
Book Production Industry and Magazine Production (Book Production; Book Binding and Book Production)
Bulletin—Association for Asian Studies, Inc., Committee on East Asian Libraries (CEAL Bulletin)
Bulletin des bibliothèques de France (Bulletin d'Informations de l'Association des Bibliothécaires Français)
Bulletin of the American Society for Information Science (ASIS Bulletin; Bulletin of the ASIS)
California School Libraries (School Library Association of California Bulletin)
Canadian Journal of Information and Library Science = La Revue canadienne des sciences de l'information et de bibliothéconomie (Bulletin [Canadian Library Association]; Canadian Journal of Information and Library Science; Canadian Library; Canadian Library Association Bulletin; Canadian Library Journal)
Cataloging Service Bulletin (LC Cataloging Service Bulletin)
CD-ROM Librarian (Videodisc and Optical Disc)
CD-ROM Professional (Laserdisk Professional)
College & Research Libraries News (C&RL News; CRL News)
Computers in Libraries (Small Computers in Libraries)
Conservation Administration News (CAN [Conservation Administration News])
Dewey Decimal Classification Additions, Notes, and Decisions (Decimal Classification Additions, Notes, and Decisions)
Document Image Automation (Optical Information Systems)
Econtent (Database)
Electronic and Optical Publishing Review (Electronic Publishing Review)
Electronic Library: The International Journal for Minicomputer, Microcomputer, and Software Applications in Libraries (Library Software Review)
FID News Bulletin (FID Informations; Informations FID)
Foreign Acquisitions Newsletter (Farmington Plan Newsletter; Foreign Acquisitions News)
Georgia Library Quarterly (Georgia Librarian; Georgia Library)
Government Information Quarterly (Government Publications Review)
Graphic Communications Weekly (Micrographic Weekly)
HCL Cataloging Bulletin (Cataloging Bulletin [Hennepin County Library. Cataloging Section])
Health Information and Libraries Journal (Health Information and Libraries; Health Libraries Review)
HLA Journal (Hawaii Library Association Journal)
IEEE Spectrum (Electrical Engineering)
IFLA Journal (IFLA News)
Inform (National Micrographics Association News; National Micro-News; NMA Journal [National Microfilm Association]; Journal of Information and Image Management; Journal of Micrographics)
Information Bulletin/Western Association of Map Libraries (Western Association of Map Libraries Information Bulletin)
Information Media and Technology: The Journal of the NRCD (NRCD Bulletin; Reprographics Quarterly)
Information Outlook: The Monthly Magazine of the Special Libraries Association (Special Libraries)
Information Processing and Management (Processing Management)
In-plant Printer (In-plant Printer and Electronic Publisher)
Interlending and Document Supply: The Journal of the British Library Lending Division (BLL Review; Interlending Review; NLL Review)

International Cataloguing and Bibliographic Control (International Cataloguing; Internet Cataloguing and Bibliographic Control
International Journal of Information Management (Social Sciences Information Studies)
International Journal of Micrographics and Optical Technology (International Journal of Micrographics and Video Technology; Microdoc)
Internet Reference Services Quarterly (Internet Reference Quarterly)
Internet World (Research and Education Networking: The Newsletter for Education, Information, and Research Networks)
JAMA: The Journal of the American Medical Association (Journal of the American Medical Association)
Journal of Chemical Information and Computer Sciences (Journal of Chemical Documentation)
Journal of Documentation (CRG Bulletin [Classification Research Group Bulletin])
Journal of Education for Library and Information Science (Journal of Education for Librarianship)
Journal of Imaging Science and Technology (Photographic Science and Engineering; Journal of Applied Photographic Engineering; Journal of Imaging Science; Journal of Imaging Technology)
Journal of Interlibrary Loan, Document Delivery, and Information Supply (Journal of Interlibrary Loan and Information Supply)
Journal of Librarianship and Information Science (Journal of Librarianship)
Journal of Scholarly Publishing (Scholarly Publishing)
Journal of the American Society for Information Science and Technology (Journal of Documentary Reproduction; Journal of the American Society for Information Science)
Journal of Youth Services In Libraries (Top of the News)
Kentucky Libraries (Kentucky Library Association Bulletin)
LA Record (Library Association Record)
LASIE: Information Bulletin of the Library Automated Systems Information Exchange (LASIE)
Librarian and Book World (Librarian)
Libraries and Culture (Journal of Library History; Journal of Library History, Philosophy, and Comparative Librarianship)
Library (Transactions of the Bibliographic Society)
Library and Archival Security (Library Security Newsletter)
Library Collections, Acquisitions & Technical Services (Library Acquisitions: Practice and Theory)
Library Journal (American Library Journal)
Library Resources and Technical Services (Serials Slants; Journal of Cataloging and Classification)
Louisiana Library Association Bulletin (LLA Bulletin)
Machine Design (Automation)
Microform and Imaging Review (Microform Review)
Micrographics and Optical Storage Equipment Review (Micrographics and Optical Equipment Review; Micrographics Equipment Review)
Mississippi Libraries (Mississippi Library News)
Multicultural Review (Online Newsletter: Library Services to Multicultural Populations)
New Library Scene (Library Scene)
New Library World (Asian Libraries; Library World)
News Bulletin/University of Chicago
Newsletter—Commission on Preservation and Access (Commission of Preservation and Access Newsletter)
Newsletter/British Library. Bibliographic Services Division (British Library Bibliographic Services Division Newsletter)
Notes (Music Library Association Notes)
OCLC Newsletter (Ohio College Library Center Newsletter; OCLC: A Quarterly)
OLAC Newsletter (On-Line Audiovisual Catalogers' Newsletter)
Optical Data Systems (Data Processing and Microfilm Systems)
Perpustakaan Malaysia (Singapore Library Journal)
PLA Bulletin (Bulletin (Pennsylvania Library Association) Pennsylvania Library Association Bulletin)
Plan and Print (Reproduction Engineer)
Popular Photography (Modern Photo)
Proceedings of the . . . ASIS Annual Meeting (Proceedings of the American Society for Information Science)
Publishing Research Quarterly (Book Research Quarterly)
Quarterly Bulletin of the International Association of Agricultural Information Specialists (Quarterly Bulletin of the International Association of Agricultural Librarians and Documentalists)
RBM: A Journal of Rare Books, Manuscripts, and Cultural Heritage (Rare Books and Manuscripts Librarianship)
Reference and User Services Quarterly (Reference Quarterly; RQ)
Reproductions Review and Methods (Reproductions Methods; Reproductions Review; RM, for Business and Industry)
Research Libraries Group News (BALLOTS Newsletter; RLG Newsletter; RLIN Newsletter)
Revue Internationale de la Documentation (FID Communications; Revue de la Documentation)
Scandinavian Public Library Quarterly (Scandinavian Library Quarterly)
School Library Journal: SLJ (Jr Libs; School LJ)
Science News (Science Newsletter)
Sci-Tech News (SLA Sci-Tech News)
Sightlines (Film Library Quarterly)
Studies in Conservation = Études de Conservation (Studies in Library Conservation)
T and E Center Newsletter (GARC Newsletter)
Texas Library Journal (News Notes Texas)
UNESCO Journal of Information Science, Librarianship, and Archives Administration (Journal of Information Science, Librarianship, and Archives Administration; UNESCO Bulletin; UNESCO JIS, Librarianship, and Archives Administration)
Zeitschrift für Bibliothekswesen und Bibliographie (Centralblatt für Bibliothekswesen;Zeitschrift für Bibliothekswesen; Zentralblatt für Bibliothekswesen)

Appendix B. Top Twenty-five Cited Journals Overall (Volumes 1–50) and Decade by Decade for Literature Surveys, and Articles and Papers Combined

Volumes 1–50

Literature Surveys	No.
1 *College & Research Libraries*	822
2 *Library Resources & Technical Services*	673
3 *Library Collections, Acquisitions & Technical Services*	512
4 *Serials Librarian*	458
5 *Library Journal*	399
6 *American Libraries*	333
7 *Serials Review*	301
8 *Library of Congress Information Bulletin*	285
9 *Microform and Imaging Review*	266
10 *Information Technology and Libraries*	263
11 *Cataloging & Classification Quarterly*	257
12 *Journal of Academic Librarianship*	243
13 *Inform*	232
14 *Collection Management*	174
15 *Publishers Weekly*	155
16 *College & Research Libraries News*	147
17 *International Cataloguing and Bibliographic Control*	142
18 *Journal of the American Society for Information Science and Technology*	128
19 *Information Media and Technology: the Journal of the NRCD*	124
20 *ALCTS Newsletter*	107
21 *Abbey Newsletter*	106
22 *Information Outlook: The Monthly Magazine of the Special Libraries Association*	105
23 *Library Trends*	94
24 *Traveler*	90
25 *Micrographics Newsletter*	89

Articles and Papers	No.
1 *Library Resources & Technical Services*	1,033
2 *College & Research Libraries*	519
3 *Library Journal*	308
4 *Journal of the American Society for Information Science and Technology*	282
5 *Cataloging & Classification Quarterly*	258
6 *Information Technology and Libraries*	204
7 *American Libraries*	193
8 *Journal of Academic Librarianship*	167
9 *Library Collections, Acquisitions & Technical Services*	159
10 *Library Quarterly*	118
11 *Journal of Documentation*	114
12 *Kentucky Libraries*	112
13 *Library Trends*	109
13 *Serials Librarian*	109
15 *Cataloging Service Bulletin*	103
16 *Library of Congress Information Bulletin*	90
17 *Collection Management*	69
18 *Conservation Administration News*	68
19 *Wilson Library Bulletin*	68
20 *Technical Services Quarterly*	67
21 *ALCTS Newsletter*	66
22 *Serials Review*	62
23 *Library Hi Tech*	60
24 *Technicalities*	56
25 *Libri*	54

Volumes 1–10

Literature Surveys	No.
1 *College & Research Libraries*	91
2 *Kentucky Libraries*	24
3 *Office*	23
4 *Inform*	22
5 *American Libraries*	15
5 *Reproductions Review and Methods*	15
7 *UCLA Librarian*	12
8 *Bulletin/Special Libraries Association, Geography and Map Division*	11
9 *Panorama/Eastman Kodak Company*	10
10 *AB Bookman's Weekly*	9
11 *Journal of the American Society for Information Science and Technology*	7
11 *Publishing Research Quarterly*	7
11 *Yale Journal of Biology and Medicine*	7
14 *Library Journal*	6
14 *Library Resources & Technical Services*	6
16 *California Librarian*	5
16 *Catalogers' and Classifiers' Yearbook*	5
16 *Electronics*	5
16 *Journal of Imaging Science and Technology*	5
16 *Know*	5
16 *Office Management*	5
16 *Oklahoma Librarian*	5
23 *Knowledge Industry Report*	4
23 *Photographic Trade News*	4
23 *Public Administration Review*	4

Articles and Papers	No.
1 *Kentucky Libraries*	110
2 *College & Research Libraries*	67
3 *Journal of the American Society for Information Science and Technology*	64
4 *Know*	46
5 *Library Resources and Technical Services*	37
6 *Panorama/Eastman Kodak Company*	33
6 *Journal of Documentation*	33
8 *Journal of Marketing*	24
9 *American Libraries*	23
10 *ALIB Information*	22
11 *Inform*	19
11 *Bulletin/Special Libraries Association, Geography and Map Division*	19
13 *Show-Me Libraries*	17
14 *Judaica Book News*	16
14 *American Archivist*	16
16 *Bibliotekar*	15
17 *Yale Journal of Biology and Medicine*	14
18 *UCLA Librarian*	13
19 *Nachrichten Für Wissenschaftliche Bibliothe*	10
20 *Scientific Information Notes*	9
21 *Indian Librarian*	9
21 *Publishing Research Quarterly*	9
21 *Letter To Libraries/Oregon State Library*	9
24 *Journal of Education for Library and Information Science*	8
24 *Bulletin/Association of Medical Librarians*	8
24 *News Notes of California Libraries*	8

Volumes 11–20

Literature Surveys	No.
1 *College & Research Libraries*	138
2 *Library Resources & Technical Services*	132
3 *American Libraries*	85
4 *Publishers Weekly*	66
5 *Library Occurrent*	63
6 *Microform and Imaging Review*	50
7 *Library Journal*	47
7 *LC Classification, Additions, and Changes*	47
9 *Information Technology and Libraries*	39
10 *Information Outlook: The Monthly Magazine of the Special Libraries Association*	37
11 *Library of Congress Information Bulletin*	34
12 *Information Media and Technology: The Journal of the NRCD*	28
13 *Microfilm Newsletter*	26
13 *Micrographic News and Views*	26
15 *Inform*	21
15 *Journal of the American Society for Information Science and Technology*	21
15 *Graphic Communications Weekly*	21
15 *Journal of Political Science*	21
15 *Micro-News Bulletin*	21
16 *New York Times*	19
16 *Advanced Technology Libraries*	19
22 *UNESCO Journal of Information Science, Librarianship, and Archives Administration*	18
22 *International Cataloguing and Bibliographic Control*	18
22 *Library Trends*	18
25 *Wilson Library Bulletin*	17

Articles and Papers	No.
1 *Library Resources & Technical Services*	259
2 *Library Journal*	100
3 *College & Research Libraries*	86
4 *Zeitschrift für Bibliothekswesen und Bibliographie*	50
5 *Information Technology and Libraries*	42
6 *Library of Congress Information Bulletin*	36
7 *American Libraries*	35
8 *Information Outlook: The Monthly Magazine of the Special Libraries Association*	34
9 *Journal of the American Society for Information Science and Technology*	29
9 *Library Trends*	29
11 *LC Classification, Additions, and Changes*	27
12 *Journal of Documentation*	23
12 *Library Occurrent*	23
14 *Library Quarterly*	20
15 *New Library World*	19
16 *International Cataloguing and Bibliographic Control*	18
17 *Journal of Economic Perspectives: A Journal of the American Economic Association*	14
17 *LA Record*	14
19 *Litho-Printer*	16
20 *Micro-News Bulletin*	12
20 *UNESCO Journal of Information Science, Librarianship, and Archives Administration*	12
20 *Wilson Library Bulletin*	12
23 *Publishers Weekly*	10
24 *LEEP Newsletter*	9
24 *Journal of Political Science*	9

Volumes 21–30

Literature Surveys	No.
1 *Library Journal*	232
2 *Library of Congress Information Bulletin*	200
3 *Library Resources & Technical Services*	198
4 *College & Research Libraries*	172
5 *American Libraries*	169
6 *Library Collections, Acquisitions & Technical Services*	129
7 *Microform and Imaging Review*	100
8 *Information Technology and Libraries*	95
9 *Inform*	92
10 *Serials Librarian*	82
11 *Information Media and Technology: The Journal of the NRCD*	79
11 *Micrographics Newsletter*	79
13 *Publishers Weekly*	70
14 *Journals of Academic Librarianship*	69
15 *College & Research Libraries News*	60
16 *International Cataloguing and Bibliographic Control*	57
17 *Information Outlook: The Monthly Magazine of the Special Libraries Association*	56
18 *Collection Management*	50
19 *International Journal of Micrographics and Optical Technology*	49
20 *ALCTS Newsletter*	48
20 *Knowledge Organization: KO*	48
22 *Journal of the American Society for Information Science and Technology*	47
23 *Library Quarterly*	41
24 *Information and Records Management*	39
25 *ARL: A Bimonthly Newsletter of Research Library Issues and Actions*	34

Articles and Papers	No.
1 *Library Resources & Technical Services*	230
2 *College & Research Libraries*	77
3 *Library Journal*	71
4 *Cataloging Service Bulletin*	60
5 *Journal of the American Society for Information Science and Technology*	49
6 *American Libraries*	47
7 *Information Technology and Libraries*	42
8 *Library Quarterly*	42
9 *Library Trends*	33
10 *Journal of Academic Librarianship*	27
10 *Library of Congress Information Bulletin*	27
12 *New Library Scene*	25
13 *Journal of Documentation*	21
14 *Libri*	19
15 *Serials Librarian*	17
15 *Library Technology Reports*	17
17 *Library Occurrent*	16
18 *UNESCO Journal of Information Science, Librarianship, and Archives Administration*	13
18 *LA Record*	13
20 *ALCTS Newsletter*	11
20 *Advances In Librarianship*	11
20 *Publishers Weekly*	11
23 *Journal of Economic Perspectives: A Journal of the American Economic Association*	10
24 *Library Collections, Acquisitions & Technical Services*	9
24 *Collection Management*	9
24 *Information Outlook: The Monthly Magazine of the Special Libraries Association*	9

Volumes 31–40

Literature Surveys	No.
1 *Library Collections, Acquisitions & Technical Services*	365
2 *Serials Librarian*	328
3 *College and Research Libraries*	281
4 *Library Resources & Technical Services*	274
5 *Serials Review*	254
6 *Cataloging & Classification Quarterly*	201
7 *Journal of Academic Librarianship*	163
8 *Information Technology and Libraries*	120
9 *Collection Management*	110
10 *Library Journal*	109
11 *Microform and Imaging Review*	101
12 *Inform*	97
13 *Abbey Newsletter*	90
13 *Traveler*	90
15 *College & Research Libraries News*	84
16 *Acquisitions Librarian*	73
17 *Variety*	72
18 *ALCTS Newsletter*	59
18 *American Libraries*	59
20 *Yale Journal of Biology and Medicine*	59
21 *Conservation Administration News*	58
22 *Collection Building*	50
22 *Technicalities*	50
24 *Microlist*	49
25 *Library of Congress Information Bulletin*	48

Articles and Papers	No.
1 *Library Resources & Technical Services*	280
2 *College and Research Libraries*	166
3 *Cataloging & Classification Quarterly*	105
4 *Journal of Academic Librarianship*	93
5 *Library Journal*	89
6 *Journal of the American Society for Information Science and Technology*	86
7 *Library Collections, Acquisitions & Technical Services*	80
8 *Information Technology and Libraries*	70
9 *Conservation Administration News*	67
10 *American Libraries*	59
11 *Library Quarterly*	53
12 *Serials Librarian*	46
13 *Abbey Newsletter*	41
13 *Collection Management*	41
15 *ALCTS Newsletter*	39
16 *Cataloging Service Bulletin*	37
16 *International Preservation News*	37
16 *National Preservation News*	37
19 *Technical Services Quarterly*	33
20 *Journal of Education for Library and Information Science*	29
20 *Serials Review*	29
22 *Technicalities*	26
23 *Library Hi Tech*	25
24 *Library of Congress Information Bulletin*	23
24 *Information Processing and Management*	22
24 *Library and Information Science Research*	22
24 *Wilson Library Bulletin*	22

Volumes 41–50

Literature Surveys	No.
1 *College & Research Libraries*	140
2 *Library Resources & Technical Services*	63
3 *Serials Librarian*	47
4 *Cataloging & Classification Quarterly*	36
4 *Technical Services Quarterly*	36
6 *International Cataloguing and Bibliographic Control*	27
7 *Serials Review*	24
8 *Journal of Internet Cataloging*	20
9 *New Library Scene*	19
10 *Book Collector*	16
11 *Library Collections, Acquisitions & Technical Services*	15
11 *Microform and Imaging Review*	15
13 *Against the Grain*	14
14 *Collection Management*	14
15 *RBM: A Journal of Rare Books, Manuscripts, and Cultural Heritage*	13
16 *Technological Review*	12
17 *D-Lib Magazine*	11
17 *Journal of Academic Librarianship*	11
17 *Journal of Library Administration*	11
17 *Library Trends*	11
21 *Collection Building*	10
22 *Information Technology and Libraries*	9
22 *International Preservation News*	9
22 *Science*	9
22 *Wyoming Library Roundup*	9

Articles and Papers	No.
1 *Library Resources & Technical Services*	227
2 *Cataloging & Classification Quarterly*	146
3 *College & Research Libraries*	123
4 *Library Collections, Acquisitions & Technical Services*	69
5 *Journal of the American Society for Information Science and Technology*	54
6 *Journal of Academic Librarianship*	47
7 *Information Technology and Libraries*	46
7 *Library Journal*	46
7 *Serials Librarian*	46
10 *Iowa Library Quarterly*	42
11 *Technical Services Quarterly*	33
12 *Library Hi Tech*	32
13 *American Libraries*	29
13 *Serials Review*	29
15 *Technicalities*	26
16 *Information Processing and Management*	23
16 *Library Trends*	23
18 *Wilson Library Bulletin*	22
19 *Libri*	21
20 *Against the Grain*	20
21 *Collection Management*	19
21 *Journal of Documentation*	19
21 *Journal of Library Administration*	19
24 *Restaurator*	17
25 *ALCTS Newsletter*	15

Family Names and the Cataloger

By Laurence S. Creider

The Joint Steering Committee for the Revision of the Anglo-American Cataloguing Rules has indicated that the replacement for the Anglo-American Cataloguing Rules, 2nd ed.*, to be known as* Resource Description and Access*, will allow the use of family names as authors and will provide rules for their formation. This paper discusses what a family name describes; examines how information seekers look for family names and what they expect to find; describes the ways in which family names have been established in Anglo-American cataloging and archival traditions; asks how adequately the headings established under these rules help users find such information; and suggests how revised cataloging rules might better enable users to identify resources that meet their needs.*

Descriptive catalogers have devoted a great deal of time over the last century to deciding how to establish personal names and corporate names, but they have largely ignored family names. Anglo-American cataloging codes have been based on the notion that authorship is the best basis for organizing access to works, and many library catalogers have not considered the possibility that families can be capable of authorship. One looks in vain for a discussion of families as points of entry or as headings in the comparative studies of cataloging codes written by Pettee, Hanson, or Ranganathan.[1] The Paris Principles adopted in 1961 do not even mention the word family.[2] This state of affairs has persisted from the days of Cutter through the various Anglo-American cataloging codes, as a glance at the indices and tables of contents of such works reveals.[3] For example, the index of the second edition of the *Anglo-American Cataloging Rules* (*AACR2*), refers the user from "Family names" to "Surnames," which are used only for individual persons in chapter 24.[4] The closest such codes come to considering family names is identifying surnames for individual persons and indicating that firms bearing the name of a person need to be entered under surname.[5]

Nonetheless, catalogers currently use family names when cataloging books about families, and archivists have a tradition of entering family papers under the name of the family responsible for the collection.[6] This paper will discuss how families act as agents and create collections of papers, including objects, letters, records of real estate transaction, or photographs. Traditional cataloging rules are unable to deal with materials such as these except through makeshift means, such as title main entry with an added subject entry for the family involved. Such means result in the inability of catalogers to describe such materials properly, and users encounter difficulties in accessing those materials. The neglect of this area by descriptive catalogers appears likely to change with the revision of *AACR2*, as the rules devised for part three of the intended replacement, *Resource Description and Access* (*RDA*) are supposed to contain rules for establishing names of families.[7]

This plan is in accordance with the draft *Statement of International Cataloguing Principles* issued by the International Federation of Library

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I wish to thank Robert Maxwell of Brigham Young University for comments and suggestions on an earlier draft. That earlier draft was completed before the Library of Congress issued its proposal for treating family names, and some of examples used in that draft appeared in the Committee on Cataloging: Description and Access response to the LC proposal. This paper mentions the Library of Congress proposal in passing but was submitted prior to the consideration of family names by the Joint Steering Committee for Revision of Anglo-American Cataloguing Rules scheduled for March 2007.

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Associations and Organizations (IFLA) Meeting of Experts on an International Cataloguing Codes that "If a person, family, or a corporate body uses variant names or variant forms of names, one name or one form of name should be chosen as the authorized heading for each distinct persona."[8] Unfortunately, the few statements in the International Cataloging Principles that concern the formation of family names (5.1.2.1.1.1-2) and the choice of entry elements (5.3) are much too vague to provide aid to the cataloger. The Library of Congress has proposed rule revisions to *AACR2* for the formulation of family names.[9] A fresh look at the problem is necessary.

Such an examination involves several steps. The first is to determine what a family name describes. This is not quite the same as the question of what constitutes a family, but both questions involve some of the same elements. The next step involves asking how information seekers look for family names and what they expect to find. The third step is an investigation of how family names have been regarded and established in the Anglo-American cataloging and archival traditions. The fourth step asks the question how adequately the headings established in accord with these traditions help users find information via family names. The last step is to suggest how *RDA* might formulate rules that better enable users to identify resources that might fulfill their needs.

What Is a Family Name?

The first question is best answered by examining what the semantic area covered by a family name is; that is, what does the name name? Without getting into the current political quagmire of what constitutes a family, the cataloger needs to understand what constitutes a family in the work(s) being cataloged, whether or not a family is capable of action, and how family names are formed. Loosely defined, a family is a group of individuals related by ties of kinship and or affiliation, generally living in a household. Relevant portions of the definition for "Family" in the *Merriam-Webster Online Dictionary* are:

> **1 :** a group of individuals living under one roof and usually under one head : HOUSEHOLD 2 a : a group of persons of common ancestry : CLAN b : a people or group of peoples regarded as deriving from a common stock : RACE 3 a : a group of people united by certain convictions or a common affiliation : FELLOWSHIP b : the staff of a high official (as the President) . . . . 5 a : the basic unit in society traditionally consisting of two parents rearing their children; *also* **:** any of various social units differing from but regarded as equivalent to the traditional family <a single-parent *family*>
> b **:** spouse and children <want to spend more time with my *family*>.[10]

In western societies, the most common notion is that such ties are biological, but they may be ties of affiliation, such as marriage. Familial ties also may be formed by a story of common descent, whether or not genetic relations are involved, by formal or informal adoption, by formal or informal association, or by spiritual kinship. As an example of association, a woman might raise the stepchild of her sister's son. While no biological or formal relationship is involved, the parties may consider themselves a family. As for spiritual kinship, during much of the middle ages baptism was held to create kinship ties that meant a godparent could not marry the surviving birth parent if one of the birth parents died.[11] In many societies, children may not marry their stepparents; that is, they already constitute a family.

Next is the question of extent. How big is a family, and how far does it extend in kinship, space, or time? Because answers to this question have varied, a description of the parameters answers might take would be more useful. A family group may be bounded by period, place, descent, or some combination thereof. Sometimes families self-identify as the descendants of a particular individual; this may or may not include descent through female lines. Klapisch-Zuber, for example, describes how medieval Tuscan families traced their lineage and family names from a common ancestor who might not have been the most distant ancestor who could be traced, and omitted lines that left no issue.[12]

Family may be nuclear or extended; it may consist of one generation or many generations. In what ways does a family differ from a clan, and a clan from a tribe? This last problem is not limited to non-western peoples; it arises also in relation to the Roman *gens*. The size of the group that the word indicates can range from nuclear family to clan to nations.[13] Many of the Germanic-speaking and other barbarian groups entering the Roman Empire during the fourth through sixth centuries regarded their members, or their elites, as sharing a common ancestor. The literature concerning ethnic identity in the wake of the Roman Empire has become immense, but archaeologists and historians have come to recognize that these were probably groups formed by individuals adhering to the group and adopting common social identifiers.[14]

Native American kin groups consist of tribes with moieties and clans, and sometimes the boundary between these and what are called families is unclear. The matter becomes particularly complex when the patterns of indigenous peoples are overlaid with the patterns required by a modern nation state.[15] Under what conditions do families become tribes or ethnic groups? For the cataloger, a family name might refer to groups in any of these categories. Is a family "co-extensive" with its name? This seems unlikely. To take an obvious

example, a family may have changed its name when individuals changed country, language, or religion. Sometimes name changes have been dictated or encouraged by states.[16]

While many of these groups have names in the sense of a common name element, be it a surname or the *gens* of classical Rome, others do not. Sometimes a family is known from the location of its major place of residence (Babenburg), sometimes it is deemed a dynasty taking its name from a founder (Capetians of France), and sometimes the family name refers to the holders of a title, even though descent may not be direct at all (Dukes of Devonshire). Surnames taken from the place of residence are not limited to noble families. Rural Finnish households took a surname from the place in which they lived; if they moved, they took the name of the new residence.[17]

Many families have never had names in any formal sense, particularly in pre-modern Europe and portions of Asia and Africa.[18] When such groups need to be described, they are given some sort of name or denomination, usually put in the terms of the individuals (judges, journalists, historians, anthropologists) who assign the names. The cataloger will be safest to consider a family name as a denomination, describing a group of individuals sharing bonds that the members feel make them a family. The larger society may or may not agree with that assessment.

What Do Users Want to Know about Families and How Do They Look?

A literature search in several databases uncovered few studies concerning the types of information users of family information are seeking and how they look for it. The studies that were found discussed variant forms of names and the difficulties they pose to researchers.[19] Therefore, answers to this question can be little more than suggestions drawn from examples of research involving family names. Many users of library and archival information can be said to seek information about a family to better understand their own identity. The specific purpose may be genealogical or historical, or both. A researcher might ask, "Who was my great-grandfather and what did he do? Where did my name come from? Who are the other members of my family and where might I find them?" Such questions may have political, social, legal, financial, and other ramifications, ranging from the opportunity to throw dirt on a political candidate by means of controversial family members, to wanting to join a society such as the Daughters of the American Revolution, to finding the holders of a copyright or a mining claim.

Historians may investigate the history of one or more families as a way of studying historical processes on a more detailed scale. Biographers may be interested in the context provided by an individual's family, or they may be interested in the lives of several members of a family, such as the Roosevelts. Users may be interested in contemporary people who share a family name, or those of a period past. The sources users want access to include the traditional books, journals, or newspaper articles; records such as correspondence, census schedules, marriage licenses, real estate, legal files, and medieval charters; and family papers. These sources can be collected or authored by a family or its members, or might even be government documents. The materials can be in manuscript, online, visual (still and in motion), audio, or other format.

Users may try to find material about or by a family group. They can be very specific in their needs, such as wanting to learn about the descendants of Jacob Hostetter (1791–1859) of Lancaster County, Pennsylvania, as opposed to the descendants of any of several other Jacob Hostetters.[20] Sometimes the need is very broad, as when an individual wants to find information about all the Millers of Ohio. Other users may want to find information about the individual members of the group, about the family as a totality, or both, as one finds in histories of great mercantile firms such as the Rothschilds or the Morgans. Some researchers may be interested in studying the different families of a particular place in a particular period, such as Renaissance Ferrara, in order to find out more about a specific topic or even the general history of that place.

The question of the methods users employ to find this information is complicated by their adaptation to systems that exclude certain approaches, such as the possibility that a family itself might be an author. A collection of family photographs or the names and dates recorded in a family Bible are information documented *by* families as opposed to information *about* the families. The researcher in official records needs to worry about variant spellings because the indexes used do not distinguish between family as author or as subject. The searcher using an online catalog, however, does need to know that distinction. Because the distinction between the use of a family name as an author and as a subject is not intuitive, searchers in catalogs are likely to be frustrated until they interact with an information professional or an experienced researcher.

Research remains to be done about the information seeking needs and behavior of users studying family names. One constant is that those researchers find themselves examining variant spellings of family names and changes of family names. As they become more sophisticated and as archival materials appear more regularly in catalogs, researchers will need to be aware of families as authors.

How Do Catalogers and Archivists Meet Those Needs?

The third question is how family names have been regarded and established in the Anglo-American cataloging and

archival traditions. Hitherto, descriptive catalogers seem to have considered families as entities incapable of authorship, or perhaps collections of persons who act independently of one another. The only way that *AACR2* would consider families to be authors would be to regard them as multiple authors who may or may not share a name and may or may not work together. Any work or collection to which more than three members of a family have contributed would be entered under title (or given a work identifier as a title main entry), with at most one family member given an access point.[21] Because descriptive catalogers have bowed out of the process of establishing family names, they have been established in library catalogs primarily as subject headings.

In the Library of Congress Subject Headings (LCSH), such names are established according to instructions in the *Subject Cataloging Manual*.[22] The names of families are established as personal name headings from evidence of their usage and from reference sources, with particular emphasis given to telephone books. The *Subject Cataloging Manual* treats families and family names as rather fuzzy entities, and a family name may be established with a number of variants that become "see" references to the chosen heading, with no attention paid to the question of common descent (e.g., Lee family).[23] The question of the relationship of the family to the family name also is not described in the instructions for LCSH. Why some names are established as separate headings and some become variant references to an established family name is unclear. Sometimes a family name that seems to be a variant of another is unrelated to it, and mistaken reference structures can be highly annoying to patrons.[24]

Why are some names that would appear to be related or variant orthographic forms not connected by references? For example, why is "Li family" established as a separate heading with no connection to "Lee family," when "Lie family" and "Yi family" are both connected to the "Lee family" by "see also" references?[25] Families whose surnames are translations of names in different languages (e.g., Smith and Schmidt, Faber and Favre) are connected by "see also" references, even if they share a common descent. When a family name has "changed substantially as a result of emigration," the names also are connected by "see also" references. The *Subject Cataloging Manual* also provides instructions for the formulation of the family names of ruling families, such as dynasties, noble or royal houses, or the possessors of a hereditary title, such as the Dukes of York.[26] Apparently, no way exists to identify a non-ruling family in a society that has no surnames, a condition that was the case for many families of Asia and Africa until recently, and that is still true for some societies (e.g., Iceland and portions of Malaysia).[27] Even in societies that have adopted surnames, people may not be identified by those surnames. In Turkey, telephone books listed individuals by given name long after surnames were adopted in the 1920s.[28]

In contrast to the descriptive cataloging tradition, the archival tradition in the United States has traditionally entered papers under the name of the family, as used by the family.[29] Variant names become separate names, perhaps unconnected by references (e.g., Clark, Clarke, Clerk, LeClercq). The reasoning here is that people looking for their own family names are upset to find that the spelling they use is a "see" reference to what they consider a "wrong" spelling of their name.[30] In the archival tradition, archivists choose the form of the name that is most commonly used in the collection, but recent archival rules are unclear about whether other forms are treated as variants with "see" references.

At this point, the most detailed rule in the United States context is in the Society of American Archivists' *Describing Archives: A Content Standard* (*DACS*).[31] Rule 12.29 covers family names and states as a basic principle that "The heading for a family consists of the family surname followed by the term 'family.'" The entry element should be the name by which the family is "commonly known" (12.29B); the sources for the name are based in descending order on the most frequent name in published works about the family, the name appearing most frequently in the archival materials being described, the latest name, and finally, the name appearing in references sources (12.29C). The British National Council on Archives gives more guidance, breaking family names down into "family name," epithet "family," title or occupation, and territorial designation allowing for qualification of families by those elements; e.g., Smith family of Lowestoft or Clerk family, chandlers.[32] Such a solution is impractical for the United States, where geographical and occupational mobility is so frequent.

The *International Standard Archival Authority Record for Corporate Bodies, Persons, and Families*, issued by the Ad Hoc Commission on Descriptive Standards of the International Council on Archives in 1996, prescribes what elements may be included in the name for an authority record but not how to decide how to construct a particular name.[33] The second edition, published in 2004, provides examples of such records.[34] Another international document, the *Statement of International Cataloging Principles*, does provide some guidelines on the formation of family names, but these are too brief to be of any help to the cataloger.[35]

How Well Do Catalogers Help Users Find What They Need?

The advantage of the LCSH method of using one heading for all families sharing a common surname (together with some variants of the surname) is that it provides collocation of different family groups. This advantage becomes a disadvantage to the researcher who is looking for one par-

ticular family group of Smiths, Garcias, or Hashimotos. The archivists' solution suffers from the reverse problem. The researcher finds it easier to locate documents by and about a specific family grouping, but different families sharing the same name or variants of that name are not collocated.[36]

Libraries and archives that have catalogs that integrate records for both published and archival materials are faced with a serious problem. If they use LCSH and the Library of Congress Name Authority File (NAF), librarians find that when they try to match headings in their archival descriptions, some names will be treated as variants to another form (and sometimes that variant form will be the most important in the context of the local community). Family name authority records will be coded to indicate that the names are not to be used as authors or added entries. If the online catalog requires separate searches for a term used as an author and as a subject, the user may be hindered in accessing materials. Libraries and archives have employed different solutions. Some libraries enter collections of family papers under title, include the name of the family in that title, and then use the LCSH form in the subject headings for the collection. Others use the particular form of the family name that appears in the record for both main and subject entries and either create local authority records or ignore the question of the LCSH headings and references. Some libraries use the name that is predominantly listed in the collection as the main entry and then use the LCSH form for subject access. All of these are half-measures to cope with an unsatisfactory situation.[37]

Other problems are posed by the existing rules for establishing family names. For example, the LCSH instructions for formulating family name subject headings provide no guidelines about what constitutes a family, or, more importantly, what distinguishes one family grouping from another. If subject catalogers were consistent in following the instructions contained in the *Subject Cataloging Manual*, things would be complicated enough. Unfortunately, as a few examples will show, catalogers face considerable difficulty in being consistent. How "see" references such as Botfield family, Bouteville family, and Botervile family can be considered variants of the Butterfield family or family name is unclear.[38] Why was the Newcomb family changed to the Newcomer family with the Newcom, Newcome, and Newcombe references retained and considered to be the same family?[39]

As mentioned previously, one of the weaknesses of the LCSH system is that it provides no way to distinguish specific family groups from larger family groups. How does one distinguish between the Creider family descended from Simeon Creider (who had eleven children) and the family composed of the descendants of one of those children? Could one treat the latter as a subheading of the main family? When do variant spellings become separate names? The fact that a given family name may or may not overlap with the family in question is also problematical. Does a "new" or different family come into existence when a member or several members of a family or families change their surname through emigration or through legal means? For example, a number of families in New York changed their surname from Hitler to other names during World War II.[40] Did these become new families?

The literature on changing surnames is considerable. Although most of this literature is concerned with the reasons why people change names or legal niceties, perusal of the articles provides the cataloger (and family historian) with an idea of the immense problems these changes pose to those who wish to provide access to families and family names.[41] Finally, LCSH and other current instructions for formulating family names are very Eurocentric, rooted in the modern state.[42] None of the current instructions account for the fact that families are conceptualized very differently in different cultures and that this fact has an effect on what is signified by the name. For example, siblings in the Sudan could, and did, adopt different surnames.[43] Scott, Tehranian, and Matthias describe the cultural presuppositions of officials who tried to assign family names to indigenous peoples in the United States and Canada, and the administrative chaos resulting from the clash of western family structures with the family naming pattern of those indigenous peoples.[44]

Some Modest Proposals

Family names are traditionally treated as a form of personal name. The MARC21 format codes them in the X00 fields, rather than in the 650 (topical subject heading) or the X10 fields used for corporate headings.[45] Nonetheless, corporate bodies might well be considered a better analogy for families than personal names. This position was taken by the American, British, and Australian responses to the Library of Congress proposal for formulating family names. Only the Canadian response stated that personal names provide an adequate model for the formulation of family names.[46]

Strictly speaking, a family is a type of corporate body, in that it consists of a group of people and not one individual. More convincingly, families take actions as a group, even when one individual is primarily or legally responsible (moving, buying a house, entertaining). One such action is the creation of family records, which are quite analogous to category 1 in the current *AACR2* (21.1B). Native American clans and similar groups of indigenous peoples in other continents own not only land, but also creative intellectual products, such as songs, dances, and stories.[47] For example, native Alaskan artists working with the Sealaska Heritage Institute sign a statement saying, "I agree to comply with

Southeast Alaska Native Traditional laws in respecting clan ownership of crests, names, songs, and other such cultural and intellectual property of clans."[48] Even if an individual "authored" the song in such cases, the clan relationship is not simply that of subject.

As with other corporate bodies (e.g., college faculties, ecclesiastical chapters, and municipal governments), a family can take action over a long period of time. Different family members take actions (updating a family tree, selling property) on behalf of a family or affecting a family, just as the different members of a corporation may take individual actions (approving budgets, creating directives) on behalf of or affecting the corporation as a whole. A given individual may belong to and act as a member of different families simultaneously or sequentially, just as individuals may be members of different corporate bodies (companies, societies, religious groups, governments). Individuals may affiliate with a family in different ways (birth, adoption, marriage, free association), just as individuals may become a member of a corporate body in different ways (birth, adhesion through an oath or subscription, employment, fee, baptism, and so on). Families may or may not have a name designating them as a family, just as corporate bodies may or may not be named, although such groups would be generally designated somewhere in the material cataloged and then named by the cataloger.

The sources for the choice of a family name as given in *DACS* (12.29C) are analogous to those for a corporate body: "Determine the name by which a family is commonly known from the following sources and in the order of preference given: a) the name that appears most frequently in the published works about the family (if any); b) the name that appears most frequently in the archival materials being described; c) the latest name; d) the name that appears in reference sources."[49] That is, a cataloger rarely has access to works issued by a family, just as a cataloger frequently does not have access to a work emanating from a corporate body when cataloging an item about that body. Reference works assume a greater importance for establishing family and corporate names than for persons (other than individuals best known for activities other than created works). In contrast to the situation with personal names, a cataloger sometimes finds determining whether a particular name is a family name difficult, just as determining whether a specific group has a corporate name is not always possible. This problem grows even worse when dealing with different cultures and languages.

Problems as well as advantages exist with the corporate body model for family names. Families change their names, often when crossing national borders. For example, when a German family settled in Baltimore in an Irish enclave, the family name of Bräutigam became Brantigan.[50] Individuals were given new names at Ellis Island that they passed on to their descendants, although some accounts are probably apocryphal.[51] Some families have changed names within a country. During World War I in this country, some German-American families anglicized their names. Are these different families? Are they earlier and later forms of the name? Or are they something else? When does a spelling variation become a new family name? For example, one of my ancestors, born in 1811, was listed as John Kreider in the 1830 and 1840 census records, and as John Greider in tax lists; that is clearly a variation. Somewhere in the 1850s or 1860s, he settled on the spelling Creider. Since then, his descendants have, for the most part, used that form. Does that make these descendants a separate family from other Kreiders or Greiders?

The corporate name model breaks down in the form in which headings are established. Personal name headings are constructed with the surname first, when one is available. Corporate names are established in direct order, at least since the older pattern of Wilson, (H.W.) firm was abandoned by AACR in a change from earlier cataloging codes.[52] Following the current pattern, one would have names such as Smith family, John W. Smith family, Paul Smith family, or Isabella Smith family. Without the support of an extensive reference apparatus, such patterns would be very hard on users who would have to guess how a particular name might be established, or researchers who wished to find works by or about different families sharing the same surname.

Corporate names are differentiated by the use of qualifiers of place or date. Application of this pattern to family names could result in headings such as John W. Smith Family (1753–1905), John H. Smith Family (1883–), Smith Family (Wooton Major, England), or Smith Family (John W., d. 1803). Inverting the names so that surname came first could result in forms such as Smith, John W., d. 1803 (Family); Smith, John W. (Family), d. 1803; Smith, John W., d. 1803, family; Smith Family (John W. Smith, d. 1803), or Smith Family (Wooton Major, England). None of these forms is particularly elegant.

Using the inverted form would preserve the analogy with personal names, but is hardly intuitive. The direct forms likely would involve less complicated encoding in MARC21 or similar standards, but would suffer from the problem of deciding which names need what qualifiers. Perhaps the last two examples, which use the surname plus the word "family" or a suitable equivalent and treat forenames as qualifiers along with place and date, might be the most useful for researchers. Whatever format is adopted will need extensive references from variant and related forms. However, the principle that the family name should be established on the basis of the work(s) referring to that family as author or subject will solve most of the problems, even if it also might result in a number of heading that would be connected by authority records.

The problem with adopting a rigid categorization for what constitutes a family name is that invariably alternatives are both conceivable and likely to occur to others. Social reality is infinitely more complex than any theories seem to be able to describe. The cataloger might be more effective describing families using their own terms instead of establishing firm conceptual boundaries that will be altered by historical developments or changes in social theory. This will involve abandoning LCSH's approach and adapting the pattern used by archivists. Basically, a family would be a group that called itself a family. Each specific family group would need to be differentiated from other groups with the same name, preferably one using that family's own terminology. This would allow the cataloger to identify families by using the terminology used by themselves or by others in writing about them without, for example, having to decide whether all Lee families include all Lea families. Differentiation between otherwise identical family names could be made by use of the qualifiers used by the source(s) of information for the heading.

Whatever approach the cataloging communities adopt to the formulation of family name headings, any solution will have to accommodate several needs. Family names will need to be used as named access points to materials described by catalogers. The same form of name for a specific family should be used in both name and subject headings.[53] In order to meet international cataloging standards, the form of name will need to be specific to the family group involved and will need to be differentiable from other families with the same or similar surname.[54] Family names may need to be connected to and distinguished from related groups by "see" and "see also" reference structures. In some cases, providing "see also" references between the names of individuals and the names of specific families analogously to performing groups may be useful. Headings will need to be constructed for unnamed family groups, if only for subject access. This last group will include family groups in cultures with no surnames. In such instances, catalogers will need to decide whether such unnamed groups can be authors.

The preceding paragraphs have suggested ways to meet these needs. Further study is necessary, particularly of cultural variations in the understanding of families and family names, the overlap and distinctiveness of families and family name both in general terms and in regards to specific families and family names (with its related question of change of name), and to family extent. The solutions to the formulations of family names as access points may become clearer

after such study. The solutions catalogers adopt should be those that stem from cataloging principles applicable to other headings with the fewest special rules.

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A Regression-based Approach to Library Fund Allocation

By William H. Walters

While nearly half of all academic libraries use formulas to allocate firm order funds on behalf of particular departments or subject areas, few have adopted systematic methods of selecting or weighting the variables. This paper reviews the literature on library fund allocation, then presents a statistically informed method of weighting and combining the variables in a fund allocation formula. The regression-based method of fund allocation uses current, historical, or hypothetical allocations to generate a formula that excludes the influence of non-relevant variables as well as the influence of arbitrary or non-systematic variations in funding. The resulting fund allocations are based on the principle of equity—the idea that departments with the same characteristics should receive the same allocations.

Methods of allocating book funds among academic programs have been discussed in the library literature since 1931, when Randall proposed that each department's allocation should account for the number of titles published in the discipline as well as the cost per title.[1] Subsequent studies have presented a wide range of fund allocation methods, including some of great sophistication. This paper reviews the literature on library fund allocation, then presents a systematic, statistically informed method of weighting and combining the variables in a fund allocation formula.

The approach described here is most useful for identifying the relationships that underlie a set of previously established allocations—for revealing the formula that best matches the allocation levels set in previous years. It is therefore especially appropriate for institutions that already allocate funds based on historical precedent but without an explicit formula. Other libraries may find the method helpful as a means of evaluating and refining the formulas already in place. Specifically, the regression-based approach to library fund allocation can be used in at least three ways: to generate an allocation formula based on previous years' allocations (in those cases where funds have been allocated based on historical precedent without the use of a formula); to generate an allocation formula based on subjectively established allocations (in those cases where funds have not been allocated among departments); and to evaluate and refine the formulas already in use (in those cases where the current formulas are unsatisfactory or otherwise in need of modification).

Rational, well-documented methods of fund allocation have several advantages over informal or ad hoc approaches. According to the Association of Research Libraries, allocation formulas and similar techniques promote transparency and the explicit recognition of underlying assumptions, encourage funding practices that are consistent with the library's goals and priorities, ensure that adequate fund monitoring mechanisms are in place, and help the library demonstrate to the university community how its funds are being spent.[2] Fund allocation formulas also are likely to promote budgetary stability over time (i.e., to reduce the

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likelihood that funding levels will vary unexpectedly from year to year) and to allow departments to predict how changes in curriculum, enrollment, and staffing will influence their library allocations.

Allocation formulas can even be used to influence the behavior of faculty and students. For instance, the formula developed at Washburn University includes a variable representing the use of the library for course-related instruction—a variable that results in higher allocations for those departments that make greater use of the library.[3] Perhaps most important, however, is the principle of equity—the idea that departments or programs with the same characteristics should get the same amount of money.[4] The equitable distribution of funds requires the careful selection of funding determinants (variables) that correspond to the goals of the library, an understanding that some determinants should be weighted more heavily than others, and an acknowledgement that changing conditions may require the revision or refinement of the initial allocation formula.[5]

The Fund Allocation Literature

Past and Current Practices

Although simple funding formulas have been in use since the 1930s, most libraries have relied on subjective allocation methods until recently.[6] In the 1920s, departmental library allocations often were set by the college president, sometimes in consultation with the faculty and occasionally with the assistance of the library director. Many institutions simply allocated the same amount of money to each department.[7] From the 1930s through the 1970s, approximately 70 percent of academic libraries reserved at least some of their book funds for the use of particular departments or programs.[8]

Not all departmental allocations were based on systematic procedures or criteria, however. Even today, many libraries simply set each year's departmental allocation equal to the previous year's allocation, perhaps with across-the-board adjustments for inflation or for changes in the overall library budget. Another common practice is to reduce the allocations of those departments that did not spend all their funds in the previous year. This can lead to rush buying and a possible decline in selection standards at the end of the year. Still other libraries set departmental allocations based on the total funding received by each department from the university.[9]

A review of relevant studies suggests that formula-based allocations first came into prominence in the 1970s. Only eleven significant scholarly papers dealing with fund allocation formulas were published from 1930 to 1969, but thirteen appeared in the 1970s, ten in the 1980s, and sixteen in the 1990s. In recent decades, roughly 40 percent of academic libraries have used formulas to allocate funds. This proportion is likely to be somewhat higher among undergraduate colleges and somewhat lower among research universities.[10] Of the ten university libraries described in a 1977 Association of Research Libraries report, only one used a formula with a weight for each variable.[11]

While allocation formulas can be applied to all kinds of library materials, relatively few institutions use formulas when allocating budgets for subscriptions or continuing resources.[12] Formulas are used more often in the allocation of book budgets or other firm order funds. Moreover, many libraries reserve part of the firm order budget for interdisciplinary or nondepartmental acquisitions. The portion of the firm order budget allocated for the use of particular departments is typically around 65 percent, with values ranging from 26 to 89 percent among a set of approximately 200 institutions.[13]

For the most part, librarians who have used fund allocation formulas are satisfied with them. Of the college librarians who reported using allocation formulas in a 1995 survey, 77 percent felt that the formulas they used were equitable.[14] Another large-scale survey revealed widespread satisfaction among librarians who expressed either positive or negative views of their libraries' fund allocation formulas.[15] Unfortunately, no published evidence shows librarians' satisfaction with other methods of fund allocation or with book budgets that are not allocated along departmental lines.

Critiques of Formula-Based Fund Allocation

Several authors have argued that allocation formulas leave no room for the kinds of scholarly judgments that have traditionally been made by subject librarians. For example, Brownson asserts that when an allocation formula is adopted, "the role of expert judgment has thus been withdrawn to the administrator, whose judgment is managing and political rather than scholarly."[16] In reality, nothing about the formula-building process privileges administrative authority or excludes scholarly expertise. If anything, fund allocation formulas reduce the likelihood that allocations will be assigned on arbitrary or purely political grounds. While Brownson carefully avoids expressing his own allocation method in algebraic terms, it is nonetheless a formula.

Likewise, Freeman argues that "College librarians should replace formulas with good judgment achieved through (1) continuous discussions with every faculty member; (2) thorough analysis of course syllabi; (3) feedback from librarians conducting bibliographic instruction and from reference librarians handling reference questions; (4) systematic evaluation of faculty publications and research in progress; and (5) information about new courses, majors, and programs."[17] Interestingly, every one of these assessment activities can be used as a means of gathering precise, quantitative information for use in an allocation formula.

Moreover, the development of an allocation formula often provides both the opportunity and the incentives needed for exactly the kinds of evaluative tasks that Freeman mentions. The process of developing an allocation formula lends itself to a project-based framework in which goals, objectives, and expectations are made explicit—a framework that may be especially useful at those institutions where collection assessment activities have not been conducted systematically or rigorously over the years.

A second criticism is that fund allocation formulas lack objectivity—that they give the appearance of scientific rigor without removing the need for subjective decision making.[18] Strictly speaking, this assertion is correct with regard to regression-based formulas. Although regression analysis is used widely in the sciences, the technique is not inherently scientific. In the context of fund allocation, regression is used primarily to specify the relationships among the variables and only secondarily to discover the true determinants of past or current funding levels. Like conventional fund allocation formulas, regression-based formulas rely on subjective judgment at several stages of the process: in the selection of variables, the compilation or construction of those variables, and the specification of the regression model. The merit of funding formulas is not that they are objective (they are not), but that they are systematic and unbiased—that departments with the same relevant characteristics will receive the same allocations, and that non-relevant characteristics will have no bearing on the results. The ultimate goal, an equitable distribution of funds, requires both the careful selection of funding determinants and the use of a formula-building procedure that results in a systematic and unbiased outcome.

Variables Used in Fund Allocation Formulas

The development of a fund allocation formula can be viewed as a two-stage process that involves (1) selecting the determinants of funding (the variables to be used in the equation), and (2) deciding how to combine and weight the variables so that the most important factors have a greater role in determining the outcome of the formula.

At least nine papers have described the variables that are potentially useful as determinants of departmental funding levels.[19] Together, the nine papers present more than sixty distinct variables representing a wide range of departmental, subject-based, and library-specific attributes. Fortunately, several methods can be used to arrive at a more manageable list of potentially relevant variables. One method is to solicit librarians' rankings of the various indicators. For example, Greaves asked librarians at fifty-four colleges and universities to rate the importance of twenty-four variables that might be included in a hypothetical allocation formula.[20] The variables considered most important, in order, were the adequacy of the library collection within the subject area, the number of new courses offered by the department, the number of students associated with the department as majors or graduate students, the number of recognized disciplines included within the department, the number of undergraduate majors, and total enrollment (credit hours).

A second method of identifying potentially relevant variables is to determine which ones have been used most often in actual fund allocation formulas. Table 1 presents the results of three major surveys of academic libraries along with a content analysis of the variables that appear in fifty-five published allocation formulas. (See appendix A for details.) Together, the values shown in table 1 represent the allocation formulas used at several hundred colleges and universities. The three surveys and the content analysis yield similar results, revealing that certain variables have been used far more often than others. The eight most frequently used variables measure two external factors—the number and cost of the titles published within each discipline—along with various aspects of the departments' courses (course offerings, course enrollment), personnel (number of faculty, number of students), and library use (circulation, course-related use).

Several authors have presented classifications of the variables that are typically used as determinants of departmental funding levels.[21] These classifications can be used to help ensure that all relevant factors are included within a fund allocation formula. The most conceptually useful classification groups the variables into three categories: supply (number of new titles published), demand (departmental enrollment, faculty, course offerings, and so on), and cost (average price per title).[22]

Supply, often represented by the number of titles published or reviewed in the previous year, is important because it accounts for the fact that far more books appear in certain subject areas than in others—far more in history than in chemistry, for example. An equitable fund allocation formula might be defined as one that allows each department to acquire a roughly equal percentage of the relevant titles published each year.

Demand variables, such as the number of students, faculty, or courses, are significant because they represent the relative importance of each department or program within the university—not in an educational sense, but in the competition for students and institutional resources. A department offering more courses, serving more students, or supporting more faculty research will presumably require a greater share of the book budget. Most allocation formulas include several demand variables, partly to represent the various dimensions of demand (courses, personnel, library use), and partly because demand-related data are often readily available.

Table 1. Variables most often used in fund allocation formulas

Variable	Greaves (%)	Data source: Budd and Adams (%)	Tuten and Jones (%)	Content analysis (%)
Course enrollment (students or credit hours)	56	84	53	87
Cost of library materials in subject area	33	61	62	76
Number of faculty	31	50	54	55
Number of majors, minors, graduate students	–	24	41	36
Circulation of materials within subject area	19	40	51	33
Number of courses offered	31	32	33	29
Number of titles published in subject area	–	13	26	20
Extent to which courses require library use	–	–	–	18
Type or level of programs offered	–	< 5	43	13
Number and level of degrees awarded	–	< 5	–	11
Scholarly activity of faculty	6	–	–	9
Previous years' allocations or expenditures	20	8	–	9
Interlibrary loan activity	–	< 5	–	5
Adequacy of library collection	20	< 5	–	4

Note: Numbers indicate the percentage of formulas that incorporate each variable. See appendix A for further information.

Some authors feel that demand is of primary importance—that library use or circulation should be the sole or chief determinant of departmental library allocations.[23] For instance, Carrigan argues that "only through use are benefits from investment in library collections realized."[24] This assertion is contrary to economic evidence, which demonstrates that several components of value are independent of use or only indirectly related to it.[25] User value (the value derived from actual use) can be contrasted with option value (the value associated with potential future use), existence value (the value assigned to the existence of a resource even by those who never intend to use it), and bequest value (the value associated with the maintenance or preservation of a resource for use by others). Moreover, low circulation can represent several factors other than low demand: the unmet need associated with weak or outdated subject collections, the presence of specialized research programs in certain fields, inexpert book selection by library patrons, or subject-specific publishing practices that encourage photocopying rather than borrowing—the publication of edited collections rather than single-authored monographs, for example.

Finally, the inclusion of a cost variable acknowledges the fact that library materials in some disciplines (art and chemistry, for instance) are more expensive than those in others. The cost variable can therefore help ensure equity in the number of titles purchased.

The most effective fund allocation formula will include not just the best variables, but the best *set* of variables. The goal is to represent all the appropriate determinants of funding while avoiding the use of multiple variables to represent a single concept. For example, enrollment might be expressed in terms of either students or credit hours, but normally not both. At least one study has shown how factor analysis can be used to select those variables that best represent the underlying characteristics found within a set of many potentially relevant variables. Using data for the South Dakota School of Mines and Technology, McGrath and associates constructed three factors that accounted for 85 percent of the variation within a set of twenty-two variables.[26] The three factors—course-related demand, research-related demand, and size of the user population—were closely associated with three of the original variables: the total number of credit hours taught within the department, the number of works cited in the graduate theses accepted over a two-year period, and the total number of undergraduate majors and graduate students registered with the department. While not all institutions will benefit from the use of such a sophisticated procedure, the

technique developed by McGrath and associates is the best way to identify the most representative variables for use in an allocation formula. Four authors provide especially good introductions to factor analysis.[27]

Regardless of the method used to arrive at a set of variables, the choice of variables is ultimately subjective and prescriptive rather than descriptive—not "Which variables are most closely related to current funding levels?" but "Which variables ought to determine how much money is allocated to each department?"

Methods of Weighting and Combining the Variables

Every fund allocation formula must weight the variables and combine them. Even the simplest approach—listing the variables and adding up their values—implicitly incorporates a system of weights (each variable weighted equally), and a combination method (additive).

Approximately two-thirds of the institutions that use allocation formulas specify unequal weights for the variables.[28] The weights do matter. Applying the formulas in use at seven different colleges to a single data set representing one particular library, Young found substantial variation in the resulting allocations.[29] For example, the proportion of the total book budget allocated to Biology varied from 27 to 47 percent when different weights were used. The proportion allocated to geology varied from 4 to 26 percent. Unfortunately, few colleges and universities have systematic procedures for weighting the variables in their allocation formulas. As noted in the guidelines published by the Association of Research Libraries:

> There is no generally recognized standard for weighting the [variables]. The weight given to a particular factor in a library will be determined by the goals and resources of the library, and will be tailored to the individual library. Many institutions determine their own weightings; e.g., enrollment in upper division units is worth two of lower division units. Others simply weight all factors in a formula equally.[30]

Many librarians realize the importance of devising a formula consistent with the institution's collection development policy as well as the need to solicit input from stakeholders both inside and outside the library.[31] Beyond that, however, most appear to use subjective or even arbitrary weights. Of the fifty-four institutions that have published their allocation formulas (appendix A), none provide an explicit rationale for the assignment of weights.

Most fund allocation formulas combine just a few variables. For example, a typical formula might express each department's share (percentage) of the total allocated budget as

$$(0.4 * e/E) + (0.3 * m/M) + (0.2 * p/P) + (0.1 * g/G)$$

where

- e is the total enrollment in courses offered by the department or program
- E is the sum of the e values, all departments combined
- m is the number of undergraduate majors in the department
- M is the sum of the m values, all departments combined
- p is the estimated price per title in the relevant subject area
- P is the sum of the p values, all departments combined
- g is a variable coded 1 if the department offers graduate courses and 0 otherwise
- G is the sum of the g values, all departments combined.

In this example, undergraduate enrollment, number of majors, average book price, and the presence or absence of graduate programs are weighted 40 percent, 30 percent, 20 percent, and 10 percent, respectively. This formula also illustrates the most common method of combining the variables. Each department's share (of students, courses, library funds, and so on) is expressed as a percentage of the total for the university as a whole.[32] The equation, a simple additive model, incorporates the assumption that no special relationships exist among the variables—that each contributes directly and proportionally (although not necessarily equally) to the outcome.

While most of the fifty-four libraries listed in appendix A have adopted very simple allocation formulas, at least three modifications to the basic formula can be found in the literature. The first modification is to include one or more variables as negative (undesirable) factors when determining the level of funding each department ought to receive. For instance, the formula

$$(0.4 * e/E) + (0.4 * m/M) + (0.2 * p/P) + (0.1 * g/G) - (0.1 * x/X)$$

specifies that departments with higher levels of x should receive less money than the others. (The x variable can be anything: new books that never circulate, unspent library funds, faculty who receive poor evaluations, and so on.)

A second possible modification is to express one or more of the variables in square root or logarithmic form. For instance, modifying the basic formula so that e (course enrollment) equals the square root of undergraduate enrollment produces a formula in which differences in enrollment at the lower end of the scale count much more than differences in enrollment at the higher end of the scale. This approach is especially useful when one or two departments are far larger than the others—when the largest departments ought to get more money, but not in direct proportion to their size. As Lowry states:

> A strong case can be made that as the number of credit hours generated increases, particularly in large classes of service courses with many sections, there is a diminishing need to provide book funds to support credit-hour production. Put another way, in the allocation of acquisitions funds, the credit hours produced by the first student . . . should count far more than [those produced by] the 251st student.[33]

A third possible modification is to treat the cost variable separately, as in

$$[(0.5 * e/E) + (0.4 * m/M) + (0.1 * g/G)] * p/P$$

where P is the average price of a book, all disciplines combined. By introducing the price multiplier outside the rest of the equation, this formula ensures that departments with the same characteristics will be able to purchase the same number of books.

Although the library literature reveals no cases in which institutions have adopted methods of fund allocation based on the principle of resource optimization, several such techniques have been proposed. For example, Goyal describes a fund allocation method based on linear programming, a mathematical technique used to determine the optimal allocation of resources under specified conditions.[34] Unfortunately, Goyal's method does not provide clear guidance for the construction or weighting of the variables. It requires the subjective determination of "the importance which society attaches to the work of the department" and "the importance which the university gives to the work of the department"—judgments that must be made outside the linear programming framework.[35] Likewise, the economic model developed by Gold relies on the subjective assessment of the extent to which students' library use benefits the university.[36] Gold's method also has been criticized for its emphasis on economic efficiency rather than equity among departments.[37] More recent applications of linear goal programming avoid the use of weights but do require the specification and ranking of the library's goals and priorities before the analysis is performed.[38]

A Regression-based Approach

Multiple regression, a standard statistical technique, can be used to assign weights to a set of variables so that the resulting formula produces results consistent with a set of predetermined values. For instance, regression can be used to assign weights to a set of supply, demand, and cost variables so that the resulting allocations are consistent with previous years' fund allocations. Within this context, regression analysis can be used in at least three ways:

- to construct an allocation formula based on previous years' allocations; this is appropriate for libraries that already assign funds to departments, but without the use of an explicit formula,
- to construct an allocation formula based on subjectively established allocations; this is appropriate for libraries that have never allocated funds to particular departments but that have nonetheless determined (at least in general terms) the amount that each department should receive, and
- to evaluate or refine existing allocation formulas or procedures.

The refinement of existing formulas or procedures can take several forms. For instance, regression can be used to modify a set of allocations so that they reflect the influence of only those variables that have been explicitly selected. This procedure removes the unique influence of any other variables—those excluded from the equation—as well as any random or non-systematic variations in funding. Likewise, regression can be used to create a new formula that maintains allocations similar to those used in previous years, but based on a new set of variables—variables that are more appropriate or more readily operationalized than those that were used in the past.

Regression analysis has been used in at least three previous fund allocation studies. More than thirty years ago, Pierce used stepwise log-linear regression to create an innovative book use variable incorporating only those components of circulation that could not be attributed to collection size or previous years' acquisitions.[39] Pierce did not use regression to weight or combine the variables in his formula, however. Similarly, Brownson constructed a conventional allocation formula, then used regression to examine the relationships among the variables.[40] He found, among other things, that past years' expenditures are closely related to current research activity but not closely related to perceived collection strength.

Finally, at least one university has used regression in the construction of a fund allocation formula.[41] The formula, incorporating seven variables (undergraduate majors, graduate students, faculty, courses taught, library circulation, current collection size, and average book price), is presented

only briefly, however. The university is not identified, and just one sentence of commentary is provided: "The formula was derived from a regression analysis using over ten years of historical data."[42]

The process used to arrive at a regression-based allocation formula is the same regardless of the reasons for undertaking the analysis. The regression-based approach to fund allocation has five essential steps:

1. Select a dependent variable that represents current, past, or hypothetical funding levels.
2. Identify a set of potential explanatory variables—factors that ought to influence the amount of money spent on behalf of each department.
3. Select the final set of variables for use in the regression analysis. (Compile and prepare the data, then examine the correlations among the explanatory variables. Decide which ones to include.)
4. Perform the regression analysis using a statistical package, such as SPSS, MINITAB, or SAS.
5. Interpret the results.

This approach will result in a fund allocation formula that is a weighted combination of the variables included in the analysis.

Step 1: Select a Dependent Variable

The regression-based approach requires not only a set of variables for inclusion in the allocation formula, but a separate variable (called a dependent variable) that represents current, past, or hypothetical funding levels. For libraries that have previously allocated funds for the use of particular departments, this variable can be the most recent set of allocations or the average of several years' allocations. For libraries with no history of departmental fund allocation, this variable must be developed outside the regression framework based on the professional expertise of the librarians, faculty, and staff.

Although the initial assignment of subjectively determined allocations is no more systematic than the ad hoc development of a fund allocation formula, the regression-based approach is appropriate whenever the individuals who allocate funds have more confidence in their ability to assign allocations to departments than in their ability to develop a new formula from scratch. Even though the initial allocations are assigned on subjective grounds before the analysis is undertaken, the regression procedure results in a new set of allocations that incorporate only the influence of those variables included in the equation. Any arbitrary or non-systematic variation in the original allocations will be excluded from the final allocations that emerge from the regression-based procedure.

Step 2: Identify a Set of Potential Explanatory Variables

For the explanatory variables—those that will be included in the fund allocation formula—several methods of selection can be used. As discussed earlier, most libraries' allocation formulas include variables representing external factors (the number and cost of the titles published within each discipline) as well as internal, institutional characteristics, such as courses (course enrollment, course offerings), personnel (number of faculty, number of students), and library use (circulation, course-related use). While previous research and practice provide guidance in the selection of variables, the decision to include or exclude a particular variable is subjective and likely to depend on local conditions.

Ideally, the explanatory variables will reflect the situation that ought to prevail rather than the historical conditions that are most likely to have resulted in the current fund allocations. Because practical considerations cannot be ignored, most allocation formulas include variables that are "resistant to deliberate local manipulation" and that can be represented adequately by data compiled within the library or elsewhere on campus.[43] Data for at least ten of the fourteen variables shown in table 1 are available at most universities from the registrar's office, the office of institutional research, or the library's own acquisitions, circulation, and interlibrary loan systems. The number of titles published, cataloged, or reviewed in each subject area can be estimated from data presented in the *American Book Publishing Record*, *Books in Print*, the *Bowker Annual Library and Book Trade Almanac*, *Choice*, *Publishers Weekly*, or *WorldCat*, or from vendors' approval plan records. One advantage of using *Choice* or approval plan records is that they cover only those titles that are appropriate for academic libraries. The cost of library materials can be estimated from many of the same sources, or calculated from internal library records. Shreeves lists ten sources of price data.[44]

Not every potentially relevant variable should be included in the regression analysis, however. There are at least three reasons to limit the number of variables: to avoid specification error (the exclusion of important variables or the inclusion of irrelevant variables), to avoid unnecessary work in compiling the data, and to achieve more robust results—results that are less likely to vary as a result of minor changes in the model specification or the data. With regard to robustness, many statisticians recommend using no more than one-tenth as many variables as cases. In practice, however, a less stringent standard is often applied. For a set of thirty or thirty-five departments, the use of five or six variables is a reasonable compromise between the need to include all the important determinants of funding and the need to limit the number of variables relative to the number of cases.

Figure 1 describes the explanatory variables that might be considered for inclusion in the fund allocation formula

Variable	Definition
t	Estimated number of relevant titles published in the subject area each year. Equal to twice the number of approval plan books and slips received over a 26-week period (May 14 to November 5, 2003). Includes items not kept or purchased. Excludes interdisciplinary and multidisciplinary titles.
c	Number of distinct courses offered in the Fall 2004 semester plus the number of distinct courses offered in the Spring 2005 semester. Excludes non-credit courses and courses without scheduled meeting times.
e	Total enrollment in courses offered by the department or program, 2004-05 academic year; the sum of individual course enrollments. Courses formally sponsored by more than one department are attributed partly (equally) to each sponsoring department.
h	Number of senior projects and master's theses submitted in the 2002-03, 2003-04, and 2004-05 academic years.
f	Number of regular faculty positions plus one-fourth the number of adjunct instructors and other part-time academic staff not on the faculty list, 2004-05 academic year.
m	Number of undergraduate majors and graduate students in the department, Fall 2004. Students with more than one major are counted more than once. Students registered for joint majors (Economics & Mathematics, Environmental Studies & Biology, etc.) are counted partly (equally) for each department.
p	Estimated price per title in the relevant subject area, 2004-05 academic year. Based on approval plan data for May 2003 to November 2003, inflated by 3 percent.

Figure 1. Variables considered for inclusion in a regression-based fund allocation formula

of a typical college library. They include six of the seven variables most often used in actual fund allocation formulas (table 1) as well as an indicator of student research activity—the number of senior projects and master's theses completed. Each variable represents a particular aspect of the external or internal environment. Specifically, the seven variables correspond to the three categories identified by Sweetman and Wiedemann:

- supply: t (number of titles published);
- demand: c (number of courses offered), e (course enrollment), h (number of projects and theses completed), f (number of faculty), and m (number of majors and graduate students); and
- cost: p (price per title).[45]

Step 3: Select the Final Set of Variables

The example analysis presented in this paper is based on data for St. Lawrence University, a small liberal arts college in Canton, New York. Data for the seven variables shown in figure 1 are presented in appendix B. If the procedures described in this paper are carried out properly using those data, the results should be identical to those reported here.

While a regression analysis might be undertaken with all seven variables, a more reliable technique is to first identify and exclude those explanatory variables that are closely related to the other variables in the set. The use of closely related variables can result in two related problems: specification error and multicollinearity.[46] Broadly speaking, the unique impact of a particular variable (and the importance of that variable as a determinant of fund allocation levels) is more difficult to ascertain when the variable is closely related to the others in the equation. No absolute standard exists for identifying closely related variables, although any explanatory variable correlated with two or more others at the 0.80 level or higher is likely to warrant further examination. The correlations among the explanatory variables can be assessed using Excel (the CORREL function), SPSS (Analyze—Correlate—Bivariate), MINITAB (Stat—Basic Statistics—Correlation), or another statistical package.

In the example analysis, variables m (majors), e (course enrollment), f (faculty), and h (projects and theses) are all interrelated (see table 2). Closer examination reveals that all the correlations with absolute values greater than 0.80 can be eliminated through the exclusion of two variables: m and either e or f.

The m (majors) variable should be excluded for two reasons. First, it is closely related to at least three other explanatory variables: e (course enrollment), h (projects and theses), and f (faculty). Second, data on the number of majors are especially likely to be adversely affected by measurement error. Many students change their majors, others have no declared major despite their strong interest in a particular field, and at least some intend to graduate with a major different than the one for which they are officially enrolled.

Although neither e (course enrollment) nor f (faculty) must be excluded due to the correlations shown in table 2, variable e should probably be excluded due to the characteristics of the particular institution represented by these data. Specifically, St. Lawrence University is a small college

Table 2. Correlations among the variables considered for inclusion in the fund allocation formula

	t	c	e	h	f	m	p
t	–	0.67	0.66	0.46	0.70	0.66	-0.12
c	0.67	–	0.71	0.29	0.73	0.53	-0.02
e	0.66	0.71	–	0.70	**0.91**	**0.89**	0.08
h	0.46	0.29	0.70	–	0.66	**0.85**	0.18
f	0.70	0.73	**0.91**	0.66	–	**0.84**	0.06
m	0.66	0.53	**0.89**	**0.85**	**0.84**	–	0.15
p	-0.12	-0.02	0.08	0.18	0.06	0.15	–

Note: Correlations with absolute values greater than 0.80 are shown in bold.

where many of the stronger or more distinctive departments do not have high course enrollments. On the other hand, variable f (faculty) ought to be included in the equation, as the number of faculty tends to correspond to the number of distinct teaching or research areas represented within each department. At St. Lawrence, faculty often are hired to cover specific disciplinary areas that are likely to require unique library resources.

Variables t (number of titles published), c (number of courses offered), and p (price per title) are only weakly related to the other explanatory variables (see table 2). This is not unexpected, as variables t and p represent supply and cost rather than demand. The absence of strong relationships between variable c and the other demand variables indicates that the number of courses represents a component of demand that is essentially unrelated to the number of students, faculty, or research projects.

Step 4: Perform the Regression Analysis

Regression analysis reveals the relationships between a single dependent variable and a set of explanatory variables (also called independent or predictor variables). In this example, the dependent variable is the amount allocated for monographic firm orders in a recent year (variable a) and the explanatory variables are those that will be included in the fund allocation formula: t (number of titles published), c (number of courses offered), h (number of projects and theses completed), f (number of faculty), and p (price per title) (see figure 1 for details). The regression equation can be expressed in the form

$$a = (w_t * t) + (w_c * c) + (w_h * h) + (w_f * f) + (w_p * p) + b$$

where the w values are the weights associated with each variable. The b term at the end of the equation is a constant—a specific, fixed value to be added to each department's allocation. The constant, also called a y-intercept, emerges from the regression analysis; it is not specified in advance. While most statistical software packages will let the user specify a y-intercept of zero, the inclusion of a non-zero constant will produce a regression equation that better fits the data.

The regression procedure can be understood best through an example involving a single explanatory variable. Figure 2 shows the regression line corresponding to the equation

$$a = (0.00166 * t) + 1.84347$$

where a is the allocation for each department and t is the number of titles published in each corresponding subject area. If the number of titles published were the only factor influencing the departmental allocations, then one would expect each dot (each department) to fall somewhere along the regression line. The allocation for any particular department could then be determined by finding the number of titles on the horizontal axis, finding the same place on the regression line, and reading off the allocation on the vertical axis. In fact, however, the allocation for each department is influenced by several factors other than the number of titles published. Consequently, most of the dots are above or below the regression line rather than right on it.

Nonetheless, the regression line and the corresponding equation have been calculated to most effectively represent the linear relationship between the two variables. The regression line is the line that most closely conforms to the pattern of dots. Specifically, it is the line that minimizes the sum of the squared vertical distances between the dots (which represent the actual situation) and the line itself (which represents the situation that would exist if the number of titles published were the only determinant of fund allocation levels). Figure 2 is a relatively simple example

showing just two variables—one dependent variable and one explanatory variable. With three variables, the graph would need to be represented in three dimensions, and the line would become a plane. With six variables, the graph would need six dimensions. While the six-variable regression cannot be shown geometrically, the corresponding equation can be solved algebraically.

The data for the example regression appear in appendix B. When regression is used to construct an allocation formula, one does not need to express each variable as a percentage of the total for the university as a whole. The inclusion of one or more variables in square root or logarithmic form may sometimes be appropriate, however. As noted earlier, such transformations can be used to specify a non-linear relationship between a particular variable (enrollment, for example) and fund allocation levels. In most applications of regression, the goal is to identify the model that best fits the observed data; the best-fitting model (linear or otherwise) is selected. When regression is used to construct a fund allocation formula, however, the goal is to produce an acceptable model that is consistent with the library's objectives. If there is good reason to believe that the largest departments should not receive allocations in proportion to their size, then it is appropriate to incorporate that stipulation into the regression equation through a transformation of the relevant variable—even if the resulting model does not provide the best possible fit. The assumptions underlying regression, and the effects of intentionally or unintentionally violating those assumptions, are described most clearly by Achen, Berry, Kahane, and Lewis-Beck.[47]

To conduct the regression analysis, first enter data for all the relevant variables into SPSS, MINITAB, or another statistical package. (Appendix B shows how the data should be arranged.) Next, choose the type of analysis and specify the variables. In SPSS, select Analyze—Regression—Linear; in MINITAB, select Stat—Regression—Regression. The fund allocation variable is the dependent or response variable; the other variables are independent or predictor variables. The default analysis options will not need to be altered.

Step 5: Interpret the Results

In the fund allocation context, the most important statistics to emerge from the analysis are the unstandardized regression coefficients. These can be found near the end of the SPSS output (in the Coefficients table—the column labeled B) or near the top of the MINITAB output (the column labeled Coef). In SPSS, click on each value in the Coefficients table to see additional decimal places. Because each coefficient is a weight in the fund allocation formula, the coefficients can simply be inserted into the standard regression equation. For the data shown in appendix B, the regression equation is

$$a = (0.00154 * t) + (0.00602 * c) + (0.01561 * h) + (0.00518 * f) + (0.06251 * p) - 1.56631.$$

This formula can be used to calculate an allocation for each department. It also can be used to show how a change in the number of course offerings, senior projects, or faculty would affect each department's library allocation. For example, each senior project or master's thesis (h) brings in an additional 0.01561 percent of the allocated firm order budget. With a total allocated budget of $200,000, each senior project or thesis represents an additional $31.22 in departmental library funding. Under the same assumptions:

- Each new title published in the relevant subject area (t) brings an additional $3.08.
- Each new departmental course (c) brings an additional $12.04.
- Each new faculty position (f) brings an additional $10.36.
- An increase of $1 in average cost per title (p) brings an additional $125.02.

In comparison with most fund allocation formulas, this particular formula emphasizes external factors (the number and cost of the books available for purchase) rather than internal factors, such as the number of courses and faculty associated with each department. The formula is "correct" because it accurately represents the implicit and previously

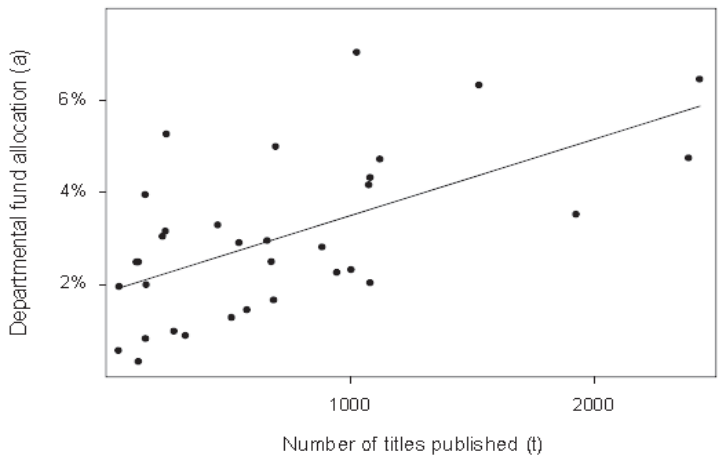

Figure 2. Regression line showing the relationship between the number of titles published and the departmental fund allocation

unspecified variables and weights on which earlier allocations were based. Many librarians would argue that the number of courses and faculty should have a greater impact on departmental allocations, and an adjustment to reflect that view would be entirely legitimate. However, any such adjustment would represent an intentional modification of the procedure (the implicit formula) on which earlier allocations were based—a fact that may be important when justifying the change to constituents outside the library.

A second important statistic to emerge from the regression analysis is the adjusted R^2 value. This value ranges from 0 to 1, but is typically within the 0.3 to 0.7 range. A high R^2 value indicates that the regression equation fits the data well—that the allocation levels that emerge from the regression analysis are similar to the previous or hypothetical allocations (those represented by the dependent variable). In contrast, a low R^2 value indicates a relatively poor fit—that the new allocations are substantially different from the previous or hypothetical allocations.

A low R^2 value does not mean that the regression-based formula is deficient or unreliable, however. In fact, it indicates only that the original fund allocations were established through a non-systematic process, or a process based on factors that are no longer relevant and therefore not found in the regression equation. That is, a low R^2 value shows that the original fund allocations were inequitable (in the sense that departments with similar characteristics could receive different allocations) and that a more systematic method of fund allocation—the regression-based method, for instance—is likely to be an improvement over past practices. For St. Lawrence University, the adjusted R^2 value is 0.44. This indicates that 44 percent of the interdepartmental variation in the original fund allocation levels can be attributed to the explanatory variables included in the regression equation.

Guides to regression analysis often emphasize significance tests, which are used to make generalizations about a population based on data for a sample. Significance tests are not especially meaningful in the fund allocation context, as the entire population of interest (the set of all the departments at a particular institution) is included within the data used in the analysis.

Commentary

Regression removes the influence of non-systematic variations in funding as well as the influence of variables not included in the equation. Consequently, the allocations that result from a regression-based formula may be appreciably different from those used in the past. This is most likely to occur among the smaller academic departments, especially when the R^2 value is low. In an analytical sense, this is not a problem; it represents the natural result of an approach that treats similar departments similarly. Realistically, however, reductions in funding are not likely to be greeted enthusiastically by the departments affected.

One method of dealing with the problem is to set aside a portion of the allocated budget for distribution in accordance with the earlier allocation procedure, gradually increasing the proportion of the budget that is allocated in accordance with the new formula. Another approach is to ask for special short-term funding to ensure that no department experiences a sudden reduction in its library allocation. These approaches to implementation are not specific to regression-based fund allocation methods. For example, the conventional formula adopted in the mid-1980s by Ohio University was put into place gradually so that no department's allocation was reduced.[48]

Two strategies might be used to encourage the acceptance of a regression-based approach to fund allocation. The first is to introduce regression strictly as an analytical technique—as a means of evaluating the extent to which each variable influences current funding levels and as a means of identifying those departments with actual allocations substantially higher or lower than the calculated values. This strategy, which can be adopted without external support or collaboration, is especially appropriate when stakeholders outside the library are unlikely to accept the procedure on its own merits—when they are likely to evaluate its acceptability primarily in terms of its impact on their own departments. This strategy also is appropriate when the regression analysis is based not on actual allocations, but on a set of hypothetical allocations established subjectively by the librarians. When regression is used primarily for analytical purposes, the resulting formula (with or without subsequent adjustments) can be presented to faculty and administrators without reference to the means by which it was developed.

A second strategy is to introduce regression right from the start as a method of allocating funds—to gain support for the procedure before the analysis is conducted so that the results will be less subject to criticism afterward. This approach is especially useful when a high proportion of faculty and administrators are familiar with regression analysis and willing to participate in the most important part of the process—the selection of relevant variables. Because the regression-based formula still may require modification, the interested parties may want to agree beforehand about the appropriate procedure for adjusting the formula. In particular, the legitimate reasons for adjustment (disciplinary accreditation requirements, for example) should be specified in advance.

If the regression-based approach to fund allocation proves acceptable, subsequent years' allocations can be set by using the same proportional allocation of funds each year, or by using the same formula with new (current) data. If the

second approach is adopted, the new departmental allocations will not necessarily total 100 percent, so they may need to be increased or decreased proportionally (multiplied or divided by a constant). With either approach, the formula itself should be re-evaluated after several years.

The regression-based method of fund allocation relies on a statistical technique that has been in use for several decades. At the same time, the particular application of regression presented in this paper has not been tested through implementation and practice. Further investigation is needed to assess the effectiveness of the method at various types of institutions and to determine the usual range of variation in the formulas developed at particular colleges and universities.

The same regression-based approach can be used for strictly analytical purposes—to examine the broader relationships underlying various fund allocation strategies. Several questions might be considered. For example, are the fund allocation strategies adopted by major research universities more strongly affected by external factors than those adopted by liberal arts colleges? Does the regression-based method of fund allocation produce systematically high or low allocations for certain fields of study or certain kinds of academic departments? One advantage of the regression-based approach is that it can be used to evaluate the determinants of funding even at those institutions that do not use explicit fund allocation formulas.

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Appendix A. Data Sources for Table 1

Table 1 presents the results of three major surveys of academic libraries (Budd and Adams 1989; Greaves 1974; Tuten and Jones 1995) along with a content analysis of the variables that appear in fifty-five published allocation formulas. The fifty-five published formulas represent fifty-four colleges and universities.

Institution	Source
Arizona State University	Brownson (1991)
Arkansas Technical University	Tuten and Jones (1995)
Augusta College	Tuten and Jones (1995)
Aurora University	Tuten and Jones (1995)
Baker University	Tuten and Jones (1995)
Berry College	Tuten and Jones (1995)
California University of Pennsylvania	Tuten and Jones (1995)
Carleton College	Richards (1953)
Catawba College	Tuten and Jones (1995)
Central Missouri State University	Brookshier and Littlejohn (1990); Niemeyer et al. (1993)
Colorado State University	Association of Research Libraries (1977)
Columbia Union College	Tuten and Jones (1995)
Curtin Institute of Technology	Allen and Tat (1987)
Davidson College	Tuten and Jones (1995)
Elon College	Jones and Keller (1993)
Florida Gulf Coast University	Donlan (2006)
Fort Valley State College	Tuten and Jones (1995)
George Mason University	Rein et al. (1993)
Georgia College	Tuten and Jones (1995)
Goucher College	Falley (1939)
Illinois Wesleyan University	Tuten and Jones (1995)
Keuka College	Tuten and Jones (1995)
Lander College	Tuten and Jones (1995)
Lynchburg College	Scudder (1987)
Lyndon State College	Tuten and Jones (1995)
Manchester College	Willmert (1984)
Methodist College	Tuten and Jones (1995)
Mount St. Mary's College and Seminary	Tuten and Jones (1995)
Notre Dame University of Nelson	Welwood (1977)
Ohio University	Mulliner (1986)
Olivet Nazarene University	Tuten and Jones (1995)
Shepherd College	Tuten and Jones (1995)
Simon Fraser University	Copeland and Mundle (2002)
South Dakota School of Mines and Technology	McGrath (1967)
Southern Arkansas University	Tuten and Jones (1995)
Southwest Texas State University	Bourgeois et al. (1998)
Southwestern Oklahoma State University	Tuten and Jones (1995)
St. John Fisher College	Tuten and Jones (1995)
St. Mary's University	Tuten and Jones (1995)
St. Norbert College	Tuten and Jones (1995)
Stetson University	Tuten and Jones (1995)
SUNY College at Potsdam	Tuten and Jones (1995)
Transylvania University	Tuten and Jones (1995)
Union University	Tuten and Jones (1995)
University of Colorado	Ellsworth (1942)
University of Constance	Schmitz-Veltin (1984)
University of South Carolina at Aiken	Tuten and Jones (1995)
University of Southwestern Louisiana	McGrath (1975)

Institution	Source
University of Stellenbosch	Graf Eckbrecht von Dürckheim-Montmartin et al. (1995)
University of Texas	Coney (1942)
University of Wichita	Hekhuis (1936)
Washburn University	Tuten and Jones (1995)
Western Washington University	Packer (1988)
Youngstown State University	Genaway (1986)

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Appendix B. Data Used in the Example Analyses

	Variable							
Department	**a**	**t**	**c**	**e**	**h**	**f**	**m**	**p**
African Studies	3.05	232	9	85	0	0	0	54.02
Anthropology	2.50	678	23	415	3	4	11	50.18
Asian Studies	2.33	1004	24	0	1	0	0	49.72
Biology	4.73	1122	34	603	29	11	91	50.43
Canadian Studies	3.17	244	10	77	0	3	1	39.80
Chemistry	5.28	248	19	412	3	6	15	68.64
Economics	4.33	1082	29	1045	10	9	95	56.91
Education	2.27	946	88	1169	1	13	48	34.86
English	6.47	2432	62	1270	15	21	118	50.52
Environmental Studies	2.82	886	36	430	3	5	40	47.35
Fine Arts	7.04	1028	41	653	1	7	43	72.02
French	2.50	130	10	213	1	4	1	43.82
Gender Studies	2.96	662	27	164	0	1	0	39.60
Geology	3.96	160	22	241	6	5	24	76.43
German	2.00	164	8	76	0	2	2	38.02
Global Studies	5.00	694	56	344	3	5	16	62.69
Government	6.33	1528	33	1035	26	10	99	52.90
History of Science	1.00	280	0	0	0	0	0	50.86
History	4.75	2388	54	794	3	10	75	45.63
Italian	0.58	50	2	52	0	1	0	42.98
Japanese	1.96	54	2	35	0	1	0	47.64
Latin American Studies	0.90	326	25	63	0	0	0	58.61
Mathematics	2.04	1082	43	1321	20	12	71	55.93
Music	3.30	458	30	294	1	3	8	48.10
Philosophy	1.67	688	24	377	3	4	5	49.32
Physics	1.29	514	17	231	1	5	11	50.60
Psychology	2.92	546	27	1302	26	12	146	57.83
Religious Studies	4.17	1076	17	403	1	4	12	34.36
Russian	0.34	132	0	0	0	0	0	49.13
Sociology	3.54	1926	32	686	11	9	48	49.15
Spanish	2.50	124	11	267	3	4	15	75.97
Speech and Theatre	1.46	576	37	452	1	7	23	50.19
Sports and Athletics	0.83	162	21	442	0	8	0	48.53

Notes: Each row represents a particular academic department. Variable a is the previous year's fund allocation—the percentage of the firm order budget allocated for materials acquired in support of each department or program during the 2004–05 academic year. See table 1 for descriptions of the other variables.

The Roles of the Metadata Librarian in a Research Library

By John W. Chapman

The position of metadata librarian recently has been a popular addition to the staff of research libraries. The position often is created in response to the opportunities and challenges of metadata management within libraries with significant digital initiatives. Treating specifically the institutions that place such a position within a traditional cataloging or technical services department, the author examines the distinctive combination of skills and responsibilities in these positions. He identifies four roles (collaboration, research, education, and development) that define the position and its mandate in the library, and also discusses the crucial factor of librarianship in pursuing these roles.

Research libraries seeking to build or strengthen digital library programs have often created positions that focus on metadata management and creation. These positions can be found in a variety of administrative units. Libraries with a strong digital production or research focus may place a metadata specialist in the unit given responsibility for digital collection maintenance and development.[1] Other library operations may put metadata professionals in close alignment with particular initiatives, such as institutional repositories or special collections digitization. Metadata librarians also exist outside of traditional research libraries.[2] These positions are outside the scope of this discussion.

Many institutions have placed the position of a metadata librarian within a traditional cataloging or technical services department. Such a department has as its major focus acquiring, describing, and cataloging monographs and serials, working primarily within a paradigm of producing MARC records that are loaded and managed in an integrated library system (ILS). Johns Hopkins University, Pennsylvania State University, University of Minnesota, Yale University, University of Colorado at Boulder, University of Tennessee, and Cornell University have (at one time or another) placed a metadata librarian in this structure. This alignment, here termed the "technical services model," will be the primary topic of this paper. The heterogeneity of other alignments makes additional generalizations difficult.

Within the technical services model, similarities emerge. While specific details vary, position descriptions show some points of commonality.[3] Beacom summarized the Yale approach to creating a metadata librarian position in a 2005 presentation, in which he laid out three areas of responsibility for the metadata librarian: standards development and documentation, metadata production, and collaboration on digital tools.[4]

Institutions that place metadata positions within technical services departments are seeking to leverage the metadata skills of their catalogers, expressed largely in MARC and displayed within MARC-centric workflows. Such departments are using the metadata librarian as a fulcrum. For example, the job description for the metadata librarian position at the University of Minnesota states that the metadata librarian will be involved in "facilitation of the integration of new types of data description into the traditional technical services workflow."[5] The

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technical services model assumes that the library has assigned the primary responsibility for digitizing and serving library resources online (for example, providing access) to a digital library unit or information technology–aligned units. Thus, functionally, the metadata librarian is positioned between the unit (technical services) primarily charged with description and the unit charged with providing access and delivery.

In most digital collections projects, a third player is involved: the collection manager or curator. The specific expertise required for description of unique content may fall beyond the abilities of technical services professionals, requiring the collection manager (or his or her designees) with subject expertise to create plans for description. This situation may result in a large portion of the description occurring outside of the cataloging or technical service department. An example of such a system is the IMAGES system at the University of Minnesota. IMAGES (Image Metadata AGgregation for Enhanced Searching) provides a Web-based entry form for university units and departments to create metadata for images scanned by the libraries' Digital Collections Unit.[6] The number of players within even a simple project gives rise to many complex relationships between them.

The metadata librarian ends up playing a variety of roles in order to work effectively with the different participants in each project. This paper will address four key roles: collaboration, research, education, and development. While none of these individual roles is unique to the metadata librarian compared to other librarian positions, the combination is unusual and especially distinctive within the technical services or cataloging environment. This is due partly, but not entirely, to the outward focus that is engendered by the collaborative and educational tasks. The roles incorporate both technical and political challenges, creating some unique pressures and tensions.

Roles Defined

Others have sought to categorize the duties of a metadata librarian. Outside of job descriptions, one can find some hints. In Beacom's presentation, he categorizes typical actions as "Consult with others . . . Coordinate metadata production . . . . Collaborate, communicate, & plan."[7] Four roles consistently appear in job descriptions for and articles about metadata librarians in the technical services model.

The author compared position descriptions posted in 2001 through 2006 by the seven institutions identified previously (see appendix). He identified common responsibilities or roles and categorized them as collaboration, research, education, and development (for example, exploration and advancement). The appendix sorts descriptive phrases from

the position postings under each of these roles. The roles and responsibilities are expanded in the next sections.

Role One: Collaboration

Digital initiatives, as described above, are necessarily complex projects that require some cross-functional collaboration. (Collaboration is understood to mean a cooperative effort between parties who share a common goal.) In institutions following the technical services model, the complexity is especially apparent. The metadata librarian in this alignment is a champion for goals for which the responsible personnel may not all be located in a single department or division, or report to the same manager. The task of cross-departmental collaboration by technical services or cataloging staff is not in itself unusual. Selection and ordering tasks require relationships between subject specialists, collection management teams, and technical services staff. The processing and description of special collections materials creates complex partnerships, often across divisions, such as cataloging and archives and special collections units. The collaborative role of the metadata librarian is different in that it also is a consultative role, requiring flexibility and negotiation as all parties design solutions that are mutually acceptable.

External collaboration (outside an organization) is becoming more and more common, and the advantages to cross-institutional collaboration, and that between industries, has been recounted elsewhere.[8] Notable among these is the Google project to digitize the collections of several prominent libraries. Collaboration of this type is assisted by the effective communication of institutional standards and procedures, with an awareness of best practices. The metadata librarian is strategically placed to be a key resource in such discussions of collaborative digital projects.

The collaborative role is internal to technical services, as well as external. The metadata librarian must work with the technical services staff to develop procedures and documentation for metadata creation that support their work in as efficient a way as possible. Local practice, when it departs from national or international standards, or previous local practices, must be documented and shared. Service on internal library committees and project teams is a crucial part of collaboration. In addition to facilitating the creation of policies and guidelines that depend on broad agreement, participation brings the added benefit of creating a public face for the metadata librarian.

Collaboration on the national level is a key component of this role. Professional groups develop new standards, discuss new technologies for search and access, and share professional knowledge of approaches and solutions. A metadata librarian can contribute to local success by sharing internally the best practices and innovative approaches discussed by these national groups. Professional groups in the metadata and data standards communities can create great opportunities for cooperation and collaboration across institutions. Two examples of groups pursuing sharing metadata include the libraries within the Committee on Institutional Cooperation, and the Digital Library Federation's Aquifer initiative.[9]

The last decade, and especially the last few years, has seen many spirited discussions of possible changes to long-standing traditions in the cataloging and description arena. In addition to announcements from the Library of Congress about changes in authority work, reports from institutions including (but not limited to) the University of California system have examined legacy cataloging practice and explored the possibility that it could be streamlined.[10] *Resource Description and Access (RDA)* will make significant changes to the *Anglo-American Cataloguing Rules,* 2nd ed. In the interests of following best practices and making cooperation with fellow institutions more efficient, many research libraries may wish to implement new workflows in their cataloging and technical services departments. Revising workflows and capacities can be politically and emotionally charged, even more so if positions are reassigned or eliminated as a result.

The metadata librarian, as one given the mandate to work with new initiatives and explore new possibilities, can be in a position to share these new ideas to the very people who will see changes to their employment situation. The metadata librarian has the opportunity to collaborate with technical services staff and their managers in providing a context for and facilitating such changes. As Higa and colleagues note, an institution-wide strategy must be implemented to avoid creating unnecessary tension in this area.[11]

Role Two: Research

Acting as a researcher, the metadata librarian must maintain a knowledge and familiarity with the new developments in the field. Research is understood to mean systematic investigation and inquiry. The metadata librarian seeks to find information that will speed development of new initiatives within the library. This research often results in new tools for technical services and cataloging staffs.

The world of metadata and electronic resource access is a large one, in constant flux as standards are defined, edited, and created, and new ideas on searching and user interfaces are developed. As individual institutions grapple with existing standards and push up against the limits of these standards, libraries have the opportunity to inform, influence, or directly contribute to the metadata schema development. When libraries need to extend or refine these standards to fit their needs, they often will make this work publicly available in order to assist others. Although this sharing assists the community at large, it is less an act of

charity than a tool to help every institution, including one's own. A new language needs speakers to become meaningful, and the adoption of new standards helps build this meaning. Research helps build awareness of best practices and eases collaboration.

A universal problem exists with integrating a new mandate, such as metadata work, into a department focused on consistent and high output of catalog records. That problem is staffing—both in terms of available hours and available skills. As was mentioned earlier, in many cases creating descriptive records for digital resources requires more intensive description than is customary for catalog records. The level of expertise in a certain subject area may not be resident in a technical services or cataloging department. The time required to train staff to reach this level takes them away from their normal cataloging duties. The knowledge gained may not be applicable to other projects. The use of cataloging staff in this situation, building on and working with descriptive content contributed by others, may often require new software, schemas, or procedures. When libraries create metadata librarian positions, they generally charge these individuals with training other technical services staff in metadata applications, which in turn enhances the newly trained staff members' utility to digital initiative managers.

Role Three: Education

Education, i.e., instruction, meshes tightly with the roles above, as it is crucial to ensure that the goals of creating efficient and effective metadata are present in all new library and information technology initiatives. The careful integration of new ideas and practices into those processes that have developed over time in cataloging and description workflows also is necessary.

As educator, the metadata librarian ensures that procedural and workflow changes are accommodated as easily as possible. Metadata librarian positions in the technical services model usually have education or instruction as a specific job duty. Position descriptions often include a technical services or cataloging audience, and a wider audience within the library and the university.[12]

The metadata librarian in a technical services model may encounter resistance to new standards and procedures on the part of staff in other library units or outside the library. For example, within a digitization project, the metadata librarian often must appeal to the collection manager to get the adherence to documented standards that is required. Staff outside of technical services may not understand the rationale for specified approaches and consistency in following them. However, education on the benefits of shared standards can be one important method by which the benefits of such cooperation and consistency are made clear.

The role as educator may expand beyond the library and institution in which the metadata librarian works. As he or she becomes known as knowledgeable and an advocate, the metadata librarian may be asked to teach workshops and give presentations in the state and region, thereby expanding understanding and skills among staff in other libraries.

Role Four: Development

Development, in this context, means the exploration of options and creation of new or revised approaches. The metadata librarian often must help develop methods to migrate, convert, and enhance metadata, making decisions on how best to balance new possibilities and existing realities. As a developer, the metadata librarian must be aware of the complexities and particulars of metadata schemas so that any needed migration or conversion can be as efficient as possible. The metadata librarian will need to read local documentation (or produce it, based on consulting with collection managers), while keeping in mind knowledge of common standards derived through research and past experience.

Many of the necessary tasks of metadata management and creation require documentation. The metadata librarian usually is expected to write technical documents to describe in a systematic fashion the structures, processes, and hierarchies of metadata schemes. This is one of the core functions described in nearly every metadata librarian job description. This documentation should be developed in the context of procedures and documentation with which the digital production staff are familiar and comfortable using.

Metadata is usually created with search access in mind. The metadata librarian, acting as developer, may be required to formulate ways to efficiently search through data in specific collections or to evaluate university-wide search tools. Taxonomies describing subject areas may be created for use both inside and outside the library's purview. The metadata librarian, especially if in a new position, may be asked to contribute to projects that draw together data created in disparate digitization projects. The metadata librarian has an important role in advancing and developing such projects and products.

Why a Professional Librarian?

Many of the roles performed by a metadata librarian put the individual in close working contact with system administrators, interface designers, Web masters, and other technology-intensive positions, both inside the library and across the university—and beyond. To what degree, then, is the benefit to the library and the institution in having this individual positioned as a professional librarian, rather than as a technician, technical professional, or other non-librarian classification? This author suggests the answer is that the librarian brings a shared perspective, an outward orientation, and a focus on access, with an in-depth understanding of the tools and techniques necessary to its provision.

Some of the job duties common to metadata librarians in the technical services model are based on or have analogs

in more traditional library professional jobs. The expertise in various content standards mirrors those of catalogers and archivists, the knowledge of record formats is complementary to the deep MARC knowledge on cataloging staffs, and the reliance on controlled vocabularies draws comparison with the database gurus in technical services departments. Metadata work is not intrinsically new; what is new is its wide application outside the cataloging world. Simser supports this position when she writes, "The 'outside world' will eventually recognize catalogers' expertise at organizing information and will see how this skill is desirable in the digital age. Catalogers have increasingly become familiar with new technologies, and taking part in initiatives will highlight that knowledge."[13]

The technical services model benefits from the metadata librarian helping the department develop skills that will raise its profile in non-traditional cataloging projects. The metadata librarian can serve as the technical services department's formal voice in digital project planning. In order to do so effectively, the metadata librarian needs to have a basis of shared experience and expertise in cataloging concepts. The requirement of a master's degree in library and information science is a common way to ensure this shared perspective.

Another benefit of assigning metadata responsibility to a professional librarian is to confirm the importance of making all forms of information easily available. This model places responsibility for gauging the quickly evolving spectrum of digital possibilities in a profession that has, at its heart, access. To say that no one without a library degree can have this mindset is false. However, the metadata librarian in the technical services model brings shared professional library values and an outward focus to the roles of collaboration, research, education, and collaboration. Without these, metadata risks being unusable, useless, or unused. The professional metadata librarian is positioned to serve in guiding and facilitating effective, efficient, and complete description of collections.

Conclusion

The position of metadata librarian, and the associated roles and responsibilities, is constantly evolving. This paper has sought to describe and analyze four roles that are presently seen in metadata librarians placed within technical services units. While specifically examined in relation to metadata librarian positions, these roles—collaboration, research, education, and development—also are descriptive of the responsibilities of professional, twenty-first-century librarians.

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Appendix. Position Descriptions for Metadata Librarians in the Technical Services Model

		Roles			
Institution	**Date**	**Collaboration**	**Research**	**Education**	**Development**
Johns Hopkins University[1]	2001	Mention of collaborating with multiple units on-campus.	Qualifications require knowledge of existing standards and awareness of developments.	Outreach for, and soliciting feedback on, digital tools are specifically mentioned	Development of documentation, content standards, and schema definition are all mentioned.
Pennsylvania State University[2]	2006	"Collaborate with other librarians and library staff, Penn State Press staff, Penn State faculty, and colleagues in other research institutions to evaluate and apply appropriate metadata schemas for digital collections held by the Libraries and University."	"Monitor and contribute to the development of national standards regarding the bibliographic control of digital resources. Explore new technologies and developments in digital applications and metadata implementation."	"Train staff to provide metadata for digital resources and provide quality control for digital object metadata."	"Provide leadership in the development of standards, policies and procedures across Technical Services, with particular responsibility for digital resources. As a member of the Digital Technology Advisory Group, manage and coordinate the process of implementing metadata, including needs assessment, metadata scheme adaptation, metadata interoperability, project management…"
University of Minnesota[3]	2004	"Collaborate with staff in Digital Collections, Special Collections/ Archives, the Digital Library Development Lab, and other Library and University of Minnesota units, on selected projects and Initiatives. . . . Collaborate with the Libraries Academic Programs departments in outreach to the campus in matters of access and description. . . ."	". . . [shall] be involved in decision-making regarding appropriate metadata schemas for local use. . . . Actively maintain current knowledge of national metadata standards and schemas. . . . "	". . . train library and other University staff in these standards and application of these concepts . . . hire, train and supervise part time staff for these projects . . ."	"[be involved in]development of reusable models for data access and tools to capture and repurpose data, and facilitation of the integration of new types of data description into the traditional technical services workflow."
Yale University[4]	2004	". . . works collaboratively with the Digital Resources Catalog Librarian, the Library Systems Office, Staff and colleagues throughout the Library system. . . . "	"Analyze the potential role of new standards in YUL Digital initiatives. . . . Continue to expand knowledge of theory and practice of metadata for digital resources. Monitor metadata and digital resource standards development and cataloging trends, and informs the Yale Library community about key developments."	Education and training responsibilities not mentioned.	"Develop and implement new approaches for creating and manipulating bibliographic data for digital resources in ORBIS, the online Library catalog, and other platforms. Work with the Library Systems Office to develop scripts to automate metadata creation and conversion."

Institution	Date	Collaboration	Research	Education	Development
University of Colorado at Boulder[5]	2006	"Assists the Head of Digital Resources Cataloging in the creation and continual evaluation of workflow for metadata provision, quality control, and training of other faculty and staff."	"Maintains a working knowledge of established and emerging metadata schema, standards, best practices, vocabularies, markup languages, and protocols."	"May teach metadata provision to members of the Cataloging & Metadata Services Department, Libraries faculty and staff, and members of academic departments as needed."	"Participates in the Department Management Group, assisting in the creation and assessment of policies and procedures relating to cataloging, the Libraries' catalog, and the metadata provision within the digital library. . . . Acts as a liaison with the Libraries' Systems Department to implement technologies that advance cataloging and metadata provision."
University of Tennessee[6]	2005	"The librarian works closely with the Digital Initiatives Coordinator and the Digital Library Programmer, who are based in the Library Technology Services, in the completion of chosen projects. . . . Work closely with content providers and Library Technology Services in the development of metadata."	"Maintain knowledge of national and international descriptive, technical and administrative metadata standards and schema and be responsible for interpreting and adapting those metadata schema for local purposes. . . ."	"[has] responsibility for training staff members in the production of metadata. . . . Perform outreach to other areas of campus to increase understanding and use of digital objects in teaching, learning, and research."	"Assist with grant submissions for additional projects and contributes to the development of a statewide digital library. . . . Assist the Team in maintaining the Team's web site and helping with XSLT use in Aleph ILS implementation."
Cornell University[7]	2003	"Works closely with staff throughout Technical Services and other divisions to provide access to the library's collections."	"[expected to]…track developments in metadata standards as well as recommend and design appropriate metadata schema (e.g., DC, MARC, TEI) to facilitate access to electronic resources and other collections."	"Actively participates in public services and bibliographic instruction programs."	"Actively participates in the library's research and development efforts. . . ."

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Exploring Categorization

Undergraduate Student Searching and the Evolution of Catalogs

By John Budd

Debate about the future of library catalogs and cataloging has been, and continues to be, featured in the literature of librarianship. Some research into the ways undergraduate students at one institution assign subjects to selected works provides insight into the cognitive elements of categorization. The design of catalogs can be informed by this research as well as work currently being done on alternative means of organization, such as information systems ontologies.

Some debates within librarianship endure even as particular aspects of the issue change. The future of cataloging is one such debate. Thomas points out that Osborn wrote of a crisis in cataloging in 1941.[1] She goes on to review changes in cataloging as an operation (including moves to outsource processes) with an eye to the quality of bibliographic control. It is apparent from her review that the idea of "quality" has not been static. Recently, writings on cataloging have focused on the catalog as an effective access mechanism, amenable to users locating the items that they will find relevant. To that end, some alterations to cataloging practices have been proposed. For example, Ortiz-Repiso and Moscoso urge, "The traditional distinction between main and added entries must be banished."[2] Their principal point is that the Web allows much more flexibility than the physical catalog ever could, so the possibilities opened by the technology should be explored with greater alacrity.

In 1994, Franz et al. published the results of a study of end-users' agreement with a group of catalogers on the meaning of subject headings. The interpretations of the meaning of current subject headings were consistent between the two groups about 40 percent of the time.[3] These results suggest a question, though—is 40 percent agreement bad or good? In other words, is such agreement higher or lower than diverse groups' agreement on the interpretation of the meaning of anything? The question related closely to the concern regarding catalogs' effectiveness at helping searchers find relevant works.

Any conceivable solution to the problem of cataloging (assuming that a problem of cataloging exists) is complicated by the sheer amount of "stuff" that is being produced. The publication of books proceeds unabated; the production of journal articles grows and grows; the less formal creation and dissemination of texts, images, and sounds increases at tremendous rates. Cataloging, since its formal and operational inception, has been intended primarily to be used to describe and provide subject access to physical items. A physical item can be described (partly) in physical terms, including size, length, and other attributes. Items can also, however, be described according their creation (the individual, group, or body that is responsible for bringing it into being) and the entity that publishes or produces

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them. The latter elements of description may transcend the physicality of the work; that is, knowing who created a Web site, and under the auspices of what body, could be very useful. There is a tradition of disclosure of such data when it comes to physical items (not always observed, of course). The disclosure is one means of assisting searchers.

Virtual works do not follow standards of responsibility and production statements with nearly as much regularity as physical ones. That information seekers find elements of responsibility and production of utility is enforced by schooling at all levels. Teachers want students to acknowledge and evaluate such sources; in higher education, the requirement of citing sources of some discernible authority is frequently explicit. The subject access component of cataloging is more problematic than other kinds of description. The subject—the "aboutness"—of a work is only partially determinate insofar as a work employs explicit and unitary lexical semantics. As that rarely, if ever, occurs, a necessary interpretative act accompanies both subject description and information seeking.

A digital work does, without question, broaden the possibilities for searching the entirety of the text. In some instances (such as works employing a technical language), searching the text is a boon; in other instances (such as works employing figures of speech and idiomatic language), the searchable text may embody some self-obfuscation. The debate also has included discussion of the efficacy of controlled vocabularies, such as thesauri, as aids to locating useful works. Miller defines "thesaurus" in a way that is intended to allow for much flexibility, yet imposes as much stability as possible.[4] He writes that it is "a lexico-semantical model of a conceptual reality or its constituent, which is expressed in the form of a system of terms and their relations, offers access via multiple aspects and is used as a processing and searching tool of an information retrieval unit."[5] The semantic, lexical, and relational aspects of a thesaurus of any kind contribute to its utility as a finding aid.

The debate includes a practical issue for libraries—the cost of cataloging as it entails the above functions. Having physical items, such as books, available to users as soon as possible after receipt is important to achieving service objectives. On the other hand, Harmon writes:

> No library director in his or her right mind would dare tell the dean or the college president that "henceforth, the university library will be providing a lower quality of service for all its patrons and proud of it." But this is exactly what they are saying when speaking of lean records, less bibliographic data, less authority control, "mark it and park it." No machine, no matter how advanced, can extract data that are not there.[6]

According to Harmon, a minimal approach signifies a dilemma for libraries, particularly with regard to providing access for users. Some others, including Marcum (Associate Librarian for Library Services, Library of Congress), are of a different opinion. As an anecdote, she relates an experience of conducting a Google search on "President Fillmore Foreign Policy":

> Never mind that the first five references include articles from Encarta and LookSmart that come with commercial advertisements. Never mind that the second reference is a sketch about Fillmore by, quote, "Caroline," last name not given, who turns out to be a Pocantico Hills School fifth grader. And never mind that the fifth reference gives some information on Fillmore from a decade-by-decade outline of events, provided by some unidentified individual. . . . So, is it any surprise that many students just go Googling instead of to the library, virtual or physical, and use whatever turns up first in the keyword search?[7]

She goes on to use Google as an example of an effective search tool for digital or digitized works.

Further Context

With the foregoing as something of a context, the task of the project reported here is an examination of the possible search strategies of a group of undergraduate students. Before describing and providing the results of the study, a more detailed painting of the contextual picture is revealed in two exchanges that have appeared in the literature of librarianship. In 1991, Gregor and Mandel argued that some quite drastic changes to cataloging practice should occur.[8] They began with a premise that "It is now possible to give up some time-consuming practices that were never based on knowledge of the worth to users."[9] They then offered some evidence on which they would base their conclusion.

Bates cites studies that, taken together, indicate that the average likelihood that any two people will use the same term for a concept or a book is 10 to 20 percent."[10] Based on that evidence Gregor and Mandel stated, "It is necessary to recognize what is unachievable, and to understand that the nature of online subject searching will compensate."[11] A few years after the appearance of that article, Mann examined the evidence that Gregor and Mandel employed.[12] For example, he pointed out that many of the studies Gregor and Mandel invoke actually studied that agreement of the interpretation by non-librarians. People may use inconsistent terminology as they try to infer meaning via subjects. Mann maintained:

> Bates's overall point is that there is a general pattern to the way the human mind works, and that this pattern of inconsistent use of terminology in describing a subject is probably valid because it shows up in so many different contexts. . . . What this suggests to me as a reference librarian is that, given such a human tendency, we as librarians need to find ways to solve these problems of inconsistent use of terminology."[13]

The second exchange began with Calhoun's publication of the report, "The Changing Nature of the Catalog and Its Integration with Other Discovery Tools."[14] The report, commissioned by the Library of Congress, stated the Association of Research Libraries members spent about $239 million in 2004 on technical services labor. On the face of it, that datum does give one pause. Also, it suggests that there may be some unnecessary duplication of effort and resources. A portion of Calhoun's report was based on twenty-three interviews of librarians and other information professionals, including vendors. The interviewees tended to affirm her position. She concluded that "The catalog is in decline, its processors and structures are unsustainable, and change needs to be swift; today, the online catalog is losing appeal for students and many scholars," and "The declining demand for today's catalogs reflects diminishing interest in already low-use research library collections, at least as they are currently housed, managed, and delivered."[15]

Some inferences can be drawn from the report: research libraries are placing resources where users' needs will not be served effectively; cataloging and access should change according to the work habits of faculty and students; and automatic categorization (classification and subject headings) can result in cost savings. Once again, Mann responded.[16] He took issue with Calhoun's emphasis on an inherent business aspect to cataloging and other library operations. In other words, he disagreed with the attention to efficiency, perhaps at the expense of effectiveness. His principal point in his rebuttal was that the measures adopted to cater to quick searching are inimical to serious scholarship, but the reverse is not the case. He brought home his point by saying, "Left to their own devices—i.e, without any prior instruction or education—they will always find only 'something' rather than an overview of the full range of material available to them."[17]

The Study

During the fall 2005 and spring 2006 semesters, students enrolled in the Library Research course offered at the University of Missouri-Columbia (MU) were surveyed. The surveys were administered at the beginning of each semester. The course used a Blackboard Web site to supplement discussion and materials, such as tutorials. The Blackboard site also has a survey function that was used to disseminate the present survey. At the time the survey was dissemination, students had been introduced to the library's catalog, so they were considering the structure and use of the catalog. The students—all undergraduates, and most freshmen—were asked the following:

> You are looking for a book in Ellis Library [MU's main library]. While you are given the title here, you do not know this title when you search the library's catalog. List two ways you would categorize this book (that is, provide two subjects for the book) based on the title below. The subjects should be ones that you could then use to search the library's catalog. In short, two things that describe what the book is about.

The purpose of the request was to investigate how students, as novice searchers, conceive of descriptions of the content of works. The students had approximately two weeks to respond, and they were free to use any resources at their disposal to select the two ways of categorization, including the catalog. The Blackboard site also allowed the students to respond over a period of time before they officially submitted their responses (after which no changes could be made). A total of 405 students responded. The titles (along with the subject headings as they appear in the MU Library's catalog) that the students were asked to categorize are listed in figure 1. While there is some artificiality to the exercise, it does garner information about the cognitive strategies that some undergraduate students employ when categorizing works.

Findings

For the first book by Johnson, only two students suggested "Knowledge—Theory of" and two suggested "Philosophical anthropology." While none mentioned "Objectivity," 174 of them did say that they would search "objective" as a subject heading. Students did offer some other possibilities; the most frequently mentioned were history, culture, philosophy, sociology, psychology, mind, and thinking. With the Gaddis book, the subject headings "History—Philosophy" and "History—Methodology" were each listed by one student; "Aesthetics—History" did not appear in any student's suggestions. Other subjects mentioned were history, landscape, past, map, and geography. The Hartman title presented at least some clarity for students, 309 of whom assigned "Ethics" as a subject. None, however, came up with "Business ethics" or "Corporate culture."

Other subjects occurring included organization(al), good life, and morality. Likewise, the work by Coyne

Title	Assigned subjects
Johnson, David Martel. *How History Made the Mind: The Cultural Origins of Objective Thinking*. Chicago: Open Court, 2003.	Knowledge, Theory of Objectivity Philosophical anthropology
Gaddis, John Lewis. *The Landscape of History: How Historians Mp the Past*. Oxford: Oxford Univ. Pr., 2002.	History—Philosophy History—Methodology Aesthetics—History
Hartman, Edwin. *Organizational Ethics and the Good Life*. New York: Oxford Univ. Pr., 1996.	Business ethics Corporate culture Ethics
Coyne, Richard. *Designing Information Technology in the Postmodern Age: From Method to Metaphor*. Cambridge, Mass.: MIT Pr., 1995.	Information technology System design
Rosenblatt, Louise M. *The Reader, the Text, the Poem: The Transactional Theory of the Literary Work*. Carbondale, Ill.: Southern Illinois Univ. Pr., 1978.	Literature—Philosophy Criticism Reading

Figure 1. Titles categorized by students

lent itself to the mention of an assigned subject heading, "Information technology," as a subject (103 times). Another 209 respondents listed "technology" alone. One included "System design," but eighty-six mentioned "design." The other subject listed with some frequency was "postmodern." The book by Greenblatt was assigned several recurring subjects, but few of the ones that were in the MU catalog record. Seven students listed "Reading," but there was only one mentioned each of "Literature—Philosophy" and "Criticism." "Literary theory" and "transactional theory" were listed most frequently. Also, theory, literature, and poetry appeared in respondents' lists.

Analysis

Taken as a whole, the kinds of subjects listed by the respondents demonstrate a limitation—many of the terms are taken from the titles of the books. Other terms that are mentioned with some frequency can usually be inferred from the titles. The limitation is essentially a cognitive one. As was mentioned earlier, one component of categorization is the representation of what is real, or ontology. It is the ontological aspect of categorization that can offer stability to any controlled vocabulary. To the extent that ontological categorization is possible (and the consistency of the lexical semantics of a work contributes to the possibility), descriptive subject terms represent works. The "discovery" of subject terms (as opposed to the "invention" of subject terms) necessitates a way of thinking that presumes at least a somewhat stable reality.

Another way of stating this point is that, as the students categorize the five works, they appear to be seeking a particular kind of disclosure. Disclosure is defined as the interpretability of meaning from reading apparent linguistic evidence. The simplest disclosure may occur in the form of terms in titles. This kind of disclosure constitutes a logical process, albeit a rather naive logic. The naiveté becomes evident, and can result in error, when "geography" is listed as a potential category for the Gaddis book, based on the title word "map." The categorization seems to represent what might be known about the works, as such knowledge is disclosed through terms in the titles. It is through the inferred disclosure that the students engage in a cognitive process based on discovery; the titles reveal ideas, knowledge, and reality to be discovered.

"Reality" appears in the preceding sentence, but it is different from "idea" and "knowledge," at least insofar as many conceptions of idea and knowledge are separate from those of reality. There is by no means anything resembling universal agreement on the connection, or lack thereof, of reality with knowledge and idea. Returning to ontology, one sees that another way of describing reality is by attempting to grasp the essential substance of something (this is an important component of Aristotle's *Categories*). Those essential substances are the features upon which other, secondary substances follow. This is a complicated notion, but a hint of its application is given in the structure of Library of Congress Subject Headings. For example, a subject heading assigned to the work by Rosenblatt is "Literature—History and criticism—Theory, etc."(although this is not included in the MU record). The logic of the subject heading's structure is that "Literature" is essential, and "History and criticism" and "Theory, etc." follow from it (or are secondary to it). The notion of categorization is more complicated still. Attention in librarianship and other information fields is presently

given to ontological description and categorization. This is a promising development, and it will be revisited in the next section. Ontological categorization includes some requirements, though.

Librarianship cannot ignore what philosophers have had to say about ontology, especially if it is to provide a basis for categorization in systems, perhaps including catalogs in the future. For example, almost a century ago Husserl expounded on the logical processes and necessities of ontology. For one thing, material ontology is the study of the essences of physical things.[18] Linnaean taxonomy is an instance of a kind of material ontology. According to Husserl, there is also formal ontology, which is the study of the essences of any thing, including abstract ideas. Husserl suggests that material ontology relies on "eidetic reduction" (from the Greek *eidos*, meaning essence). This essence is not bound to any single temporal representation (or token) of a thing, which means that a particular triangle embodies an essence that is defined by the properties of "triangle." Husserl goes so far as to say, "Every factual science (empirical science) has essential theoretical essences in eidetic ontologies."[19]

Not everyone agrees with Husserl's reduction to essences, but it does offer a beginning. It is difficult, if not impossible, to apply only material ontology to the content of works such as the five books used in this study. A full understanding of things, for Husserl, requires reflection; the experiencing of things (including abstract ideas) adds a layer of richness to the perception of the reality of those things. Reflection rounds out what Husserl calls a phenomenological analysis, and this analysis is what many people have in mind regarding information systems ontologies. Reading a book necessitates interpretation of possible meaning, so the experience of reading transcends the physical book or the physical act of viewing images or hearing sounds. The reflective act is transformative; "every category of 'reflexion' has the character of a modification of consciousness."[20] This transformation affects categorization.

Both the ontological reduction and the transcendental reduction are necessary to realize the intended outcome of categorization, or the understanding of the meaning of something.[21] Further, the reductions are promising practices in the development of systems that can assist searchers as they seek works that relate to their queries. More fundamentally, instruction in the practices of reduction can help searchers formulate their queries.

An extrapolation from the categories provided by the respondents in this study helps to illustrate the complexity related to achieving understanding. A limitation of the study is that the instruction in the reductions, just mentioned, had not occurred at the time the students were surveyed. The limitation was intentional; the purpose of the survey, as stated previously, was to gain understanding of the ways undergraduates conceive of categories early in their programs. The extrapolation entails searching MU Library's catalog using the terms suggested by the students. The results of the searches can then be examined. Table 1 presents the numbers of hits for the terms, searched as subjects and as keywords.

The numbers of hits for the listed terms tend to be high. Moreover, the sorting options for the display of the hits are limited. A searcher could limit by date and by language (among some other options), but the display is in alphabetical order. As subjects headings are not assigned hierarchically (e.g., the first listed heading being the one that most clearly or strongly designates "aboutness"), there is no ranking of displayed hits. When hits are numerous and there is no form of ranking, students—especially undergraduate students—may be frustrated by the results. Recalling Marcum's anecdote, the results of a Google search may suggest some relevant items among the first page of listings. Even when valid and assigned subject headings are used there can be a large number of hits. "Reading" is assigned to the Rosenblatt work, but a subject search yields 3,805 hits.

The cognitive limitations of undergraduate students are not likely to be alleviated by structural elements of library catalogs. Instruction in the nature of catalog structures may help students overcome some initial limitations (for example, the kind of phenomenological analysis Husserl details can enhance students' abilities to reflect upon searching and finding possibilities) and may assist students in locating and using potentially relevant works, but systemic obstacles remain.

Discussion

The implications of the present study's results should be taken in combination with some recent work in categorization, especially inasmuch as categorization is a practical tool for finding concrete and abstract ideas related to a searcher's needs and wants. Much of the recent work centers on conceptions of ontology. It is important to define "ontology," as it tends to be used in libraries and the information world. Jacob provides a definition that is a useful starting point: "an ontology can be defined as a partial, simplified conceptualization of the world as it assumed to exist by a community of users—a conceptualization created for an explicit purpose and defined in a formal, machine-processable language."[22] In practice, ontologies may exhibit some characteristics of "uncontrolled vocabularies," but only to a limited extent.

Some exercise of control in the construction of ontologies (as distinguished from ontology in the sense of the study of essences) could be possible. The control may be exercised communally, rather than centrally. That is, an ontology might be an emerging structure that includes contributions from a number of individuals; sometimes the individuals are

Table 1. Search results for respondent-suggested terms

Term	No. of hits (subject)	No. of hits (keyword)
Object	221	1,198
History	11,632	32,000*
Culture	1,476	32,000*
Philosophy	2,573	32,000*
Physiology	1,362	32,000*
Sociology	641	12,292
Landscape	962	5,456
Past	524	10,802
Map	1,590	13,802
Organization	124	10,071
Good life	35	262
Morality	See Ethics	2,969
Technology	965	32,000*
Design	4,701	29,998
Postmodern	370	2,263
Literary theory	603	919
Theory	3,718	32,000*
Transactional theory	0	2
Poetry	3,663	32,000*
Literature	16,982	32,000*

* The system default maximum is 32,000.

members of a disciplinary community. This kind of communal categorization may result in efficient and effective categorization, especially if some standards of consistency and requirements of ontological and phenomenological contribution are applied.

A detailed critique of current information systems ontologies by Fonseca and Martin suggests some reasons why present practice has some shortcomings, though.[23] They point out limitations of any purely instrumental approach to the design of ontologies (that is, focus on how searchers may employ terms, rather than any effort at representing reality or truth, broadly defined), as only narrow intellectual, technical, or practical domains would be able to reach some agreement on common linguistic representations that would be useful. Any broad domain would experience disputes over the categorizations of particular works or events. Drawing from Kuhn, Fonseca and Martin maintain that the broader the intended domain of users, the more likely it is that some incommensurability (or categorical inconsistency resulting from differing worldviews) will be present. They conclude, "Perhaps the key point is to see that an ontology editor is distinct from ontologies. We conceive it to be a 'place' where persons assuming different conceptual schemas may come to learn from one another through interaction with each other and with their texts."[24]

One way to interpret their conclusion is that categorization could be of enhanced usefulness if there could be some informed dialogue about the process and its outcomes. Such a suggestion is quite distinct from application of folksonomies that can be more anarchic in application and in results. Noting that "folksonomy tags are not merely 'messy,' they can be inaccurate," Peterson states, "A traditional classification scheme based on Aristotelian categories yields search results that are more exact. Traditional cataloging can be more time consuming, and is by definition more limiting, but it does result in consistency within its scheme."[25]

The disputes that have involved Gregor et al. should be revisited within the context of the work being conducted on information system ontologies and other alternative structures. There are opportunities for a considerable amount of empirical inquiry into the searching, retrieving, and use practices of information seekers. It may be that future systems design can build upon the successes (material and phenomenological) of several ideas of categorization. Library catalogs may not be dead, but there could be some informed research that can contribute to their evolution. While full- or free-text searching has some benefits, it is by its nature unstructured. Some kind of conceptual categorization will almost inevitably be used by information seekers. Following Lakoff, a couple of points should be remembered: (1) people are very likely to use differing conceptual systems (that is, people may see the same things in different ways), and (2) "To change the concept of category itself is to change our understanding of the world. At stake is our understanding of everything from what a biological species is to what a word is."[26]

Lakoff's observations are reflected in the results of the present study. While categorization is common in human action, it can be quite variable. The subject organization of a library's catalog necessarily imposes some structure on the contents of the works (necessary because the controlled vocabulary can incorporate definitional application that is used in the entirety of the catalog). The findings and analysis here in no way suggest abandonment of subject cataloging; rather, the findings point to the need to make the concept and use of a controlled vocabulary central to formal and informal instruction in the use of the catalog. For libraries in any educational setting, an objective is not merely to help searchers locate *something*, but to help them find something *meaningful*. The design of future catalogs can

combine formal categorization with a form of ontology so as to create useful access to the contents of libraries. The authors of the Indiana University report affirm this observation: "Catalogers need to look beyond the online catalog for places to apply their knowledge and skills. Cataloging departments must adopt a more holistic approach that broadens the concept from 'cataloging' to the 'organization of information.'"[27]

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Building Connections

A Review of the Serials Literature 2004 through 2005

By Cecilia Genereux

This review of 2004 and 2005 serials literature covers the themes of cost, management, and access. Interwoven through the serials literature of these two years are the importance of collaboration, communication, and linkages between scholars, publishers, subscription agents and other intermediaries, and librarians. The emphasis in the literature is on electronic serials and their impact on publishing, libraries, and vendors. In response to the crisis of escalating journal prices and libraries' dissatisfaction with the Big Deal licensing agreements, Open Access journals and publishing models were promoted. Libraries subscribed to or licensed increasing numbers of electronic serials. As a result, libraries sought ways to better manage licensing and subscription data (not handled by traditional integrated library systems) by implementing electronic resources management systems. In order to provide users with better, faster, and more current information on and access to electronic serials, libraries implemented tools and services to provide A to Z title lists, title by title coverage data, MARC records, and OpenURL link resolvers.

As in past years, electronic journals pervaded all aspects of the serials literature in 2004 and 2005. Electronic journals were changing pricing models as well as management of and access to serials. Support and satisfaction with large, bundled collections of online journals diminished as librarians questioned their benefits and affect on collections. Librarians began looking at other pricing models, such as tiered pricing and open access. Managing and providing access to serials became more complicated, especially as the number of e-journals available to libraries grew. Typical print workflows did not work with online serials. Additional information, such as tracking subscriptions, licenses, URL changes, and title level coverage information, needs to be monitored. In response to those challenges, new serials management services and tools were developed and implemented by libraries. Some of those services assist in tracking coverage information, generating A to Z title lists, and providing MARC records. These services are changing the way serials are cataloged. Loading records has led to libraries changing their cataloging policies and is changing the responsibilities of serials catalogers.

Although e-serials touch all aspects of serials literature, another topic frequently mentioned directly and indirectly is the relationship between libraries, publishers, and vendors. The importance of communication and collaboration among all parties in the scholarly communication circle is illustrated by events and endeavors captured in the literature during 2004 and 2005. Examples of collaboration include those between publishers and libraries in dealing with the demise of divine, Inc. and the RoweCom bankruptcy; between an integrated library system vendor and libraries in creating a new serials management tool; and among all three groups in establishing standards for communicating serials metadata. Dialogue between libraries and scholars, who create, edit, and review journal

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content, has created greater awareness among scholars of journal pricing and open access issues.

Recent Literature Reviews

In looking back at the serials literature of 2004 and 2005, examining past literature reviews to get an idea of where the profession was prior to 2004 and where it might be heading is valuable. Two serials literature reviews have been published in recent years. In 2004, Silva reviewed the serials literature of 2002.[1] Noting that a review of literature had not been written since Riddick's in 1992, Silva did not attempt to fill in the gap between 1992 and 2002.[2] Instead Silva focused on serials literature of 2002 while briefly comparing 2002 topics of cataloging, electronic publishing, collection management, serials pricing, and serials management with the major themes identified previously in 1992. Silva found that, in 2002, networked information and electronic publishing—which were only just being introduced in 1992—inspired "nearly as much discussion in the serials literature as cataloging issues do."[3] The issue of electronic serials was no longer limited to networked information and electronic publishing; it pervaded all of the themes identified by Silva.

In the second and most recent serials literature review, covering the period of 2000 through 2003, Corbett found that electronic serials dominated the literature.[4] Addressing a broader time period than Silva, Corbett took a slightly different approach to the review and limited it to the major themes of cost, management, and archiving. Instead of trying to capture all of the articles published within those themes, Corbett identified articles of significance, or that best represented a group of articles on a topic. However, not all major events and research were captured in the refereed literature, and Corbett looked beyond peer-reviewed publications for those.

Picking up where Corbett left off, this review covers the serials literature of 2004 through 2005. The author has chosen to focus on the subjects of cost, management, and access in the literature. This review also looks at how the connections between parties in the scholarly communication process have shaped the literature in those three areas. Like Corbett, this author found it necessary, at times, to look beyond peer-reviewed literature in order to cover major events or research. Not included in this review are issues related to collection development, such as statistics, transitioning from print to electronic collections, and archiving.

Cost

In 2004 and 2005, periodical prices rose at about the same rates as in the past several years. According to Dingley's study of United States periodical prices, inflation rates continued to climb between 2003 and 2004, going from 7.5 to 8.2 percent, but dropped slightly to 6.5 percent in 2005.[5] As serials prices increased, so too did the serials percentage of libraries' materials expenditures. In 2003 and 2004, serials expenditures made up 67 percent of materials expenditures at Association of Research Libraries (ARL) institutions.[6] The cumulative increase in serials expenditures from 1986 to 2004 was 273 percent, an increase of 13 percent from 2003.

In late 2004, Oxford University Press released findings from a study it commissioned on journal price increases among twelve publishers of scholarly journals.[7] Both commercial and not-for-profit publishers were included in the study, which found that overall price increases, from 2000 through 2004, varied from as low as 27 percent at Cambridge University Press (CUP) to as high as 94 percent at Sage Publications.[8] Elsevier had the highest median journal prices for its titles, while CUP and Johns Hopkins University Press were in the bottom three median prices for every subject in which they publish.

In an article that evolved from a presentation at the 2004 North American Serials Interest Group (NASIG) annual conference, Siar, Schaffner, and Hahn examined, from the perspective of a librarian and a not-for-profit publisher, three types of current pricing models: variations of the traditional subscription, tiered pricing, and consortial pricing.[9] Traditional subscriptions have been for individual print titles, while variations on the traditional subscription now include subscriptions for individual online titles, and either print or online with the other format for free (or at an additional, although reduced, fee).

Consortial pricing allows a group of libraries to leverage their collective bargaining power to obtain a reduction in subscription rates. Consortial prices generally provide groups of libraries with access to a larger number of titles than could be achieved individually. In the tiered-pricing model, differential prices are based on the size of the subscribing institution. This model has been common for electronic resources, but it has recently crept into practice for individual print and electronic journals. In a survey of tiered-pricing models in 2004, Hahn found that several scholarly society publishers adopted tiered pricing for thirty-one journals.[10] To understand the consequences of tiered pricing, Hahn conducted sensitivity analysis of tiered-pricing models and found that, for journals with a subscriber base predominantly in lower tiers, subscribers in the highest tiers would face significant price increases, even when the differentials between the lowest and highest tiers are low.[11]

Another pricing model featured in the serials literature during 2004 and 2005 was the Big Deal. The Big Deal is a license subscribing to a package or bundle of electronic journal titles over multiple years. As publishers have

merged, there are fewer journal bundles available with larger numbers of titles. Typical licensing terms for bundles have caps on annual inflation rates and cancellation limitations. Depending on negotiations, licenses may contain terms on archiving and nondisclosure. The journal bundles often contain titles that a library may not necessarily want and would not have selected if selecting on a title by title basis, and cancellation terms protect these titles during journal cancellation projects. A 2005 survey of ARL members on the topic of bundled journals found that although bundles were common, with respondents having, on average, three bundles with the five largest journal publishers, librarians' satisfaction with pricing and licensing terms were decreasing as Big Deals were renegotiated.[12]

Addressing the Big Deal from another perspective, a Stanford University survey of members from twenty life sciences societies looked at how scholars have reacted to journal pricing models, including the bundling of e-journals.[13] The survey authors indicated that profit maximizing by publishers through Big Deals has resulted in cancellation of individual subscriptions and driven scholars to rely on library or other institutional subscriptions. With reduced personal subscriptions, publishers increase journal prices in order to maintain profits and rely more heavily on institutional subscriptions. The survey authors recommended that publishers keep in mind that "libraries are aggregate consumers (for individuals) and if individuals are not willing to pay for journal access at a given price, neither are libraries."[14] The authors also recommended that libraries might be able to increase their bargaining power by collaborating with users. By communicating and building awareness among scholars of publishers' pricing practices, libraries may be able to influence where scholars submit and publish their articles.

Support for bundled electronic journals began to diminish in late 2003 and into early 2004, as academic libraries did just what the Stanford survey recommended. Efforts by libraries to increase faculty awareness of the ever-rising journal subscription rates (also known as the serials crisis), the role of the Big Deal in the crisis, and alternative publishing models paid off. In December 2003 and early 2004, faculty senates at several institutions passed resolutions demonstrating support for their libraries' decisions to refuse the Big Deal.[15]

The Big Deal continued to be discussed at conferences and written about in 2004. Speaking at the 2004 NASIG conference, Frazier addressed what he considered to be the biggest problem with Big Deals: the eventual inability of libraries to support journal package cost increases.[16] Following Frazier with another take on the Big Deal, Ebert presented the benefits that the Big Deal can bring to smaller library collections.[17] For smaller libraries, the Big Deal can represent significant increases in their collections. Beyond the discussion of the positive and negative aspects of the Big Deal, an article by Gatten and Sanville in *D-Lib Magazine* examined how a consortium might go about backing out of the Big Deal, title by title.[18] Armed with usage data for titles across the OhioLINK consortium, the authors identified low-use titles across the consortium and determined that usage data could be used in the future to drop titles from Big Deal collections.

Open Access

With the growing faculty awareness of the serials crisis that withdrawing from the Big Deal fostered, libraries and their institutions increasingly promoted open access (OA) as a way to provide access to scholarly output and attempt to halt or slow journal price increases. Although OA journals have been around for some time (Regazzi noted that as of early 2004, 81 percent of the titles listed in the *Directory of Open Access Journals* were founded in 2001 or earlier), momentum for OA as an alternate publishing model built in late 2003 and continued in 2004 and 2005.[19] As interest in OA picked up, many articles on the subject appeared in the literature, including a special issue on the topic in *Serials Review*.[20] The articles in that issue, in addition to articles and reports published elsewhere, focused on the various types of OA publishing; the acceptance of OA with publishers, librarians, and authors; the sustainability of it as a business model for scholarly communication; and analysis of OA costs.

Interest in OA as a publishing model arises from two concerns: rising journal subscription prices and restrictions placed on the use of journal content.[21] Two basic types of OA publishing models have developed to address the two problems. The first model addresses, or seeks to address, escalating journal prices by switching support for publishing costs from the subscriber to the author, the author's institution, scholarly society, or funding agency. BioMed Central and the Public Library of Science are two examples of the author or institutional fee-supported publishing model. Many variations of OA are in use: some publications offer selected OA articles, leaving the choice up to the author; other publications offer open access to articles in a set number of months after the article's initial publication.

The second type of OA model uses repositories and addresses the issue of restrictions on use. Repositories often are hosted at academic institutions and offer authors a place to self-archive pre-prints or post-prints, or both. They can be subject-based, such as arXiv, or limited to the intellectual output of a specific institution. While arXiv—originally a pre-print database for physics—has successfully expanded to include mathematics, nonlinear sciences, computer sciences, and quantitative biology, not all subject repositories

that have been created or proposed have succeeded. Weller noted both the success of arXiv and failed attempts in chemistry, psychology, and medicine, and concluded that, "The acceptance and use of preprint databases appears to be discipline specific."[22]

Mark Ware Consulting provided an environmental scan on institutional repositories (IR).[23] The report examines forty-five IRs, looking at the reasons for them, their uses, issues facing them, and publisher attitudes toward them. The report found that IRs are generally small and in the early stages of development. The report cautioned that while e-prints make up about 22 percent of the content in IRs, evidence suggests that they may have little impact on scholarly communication reform, and the number of e-prints could reflect the early stages of IRs.[24] The report concluded:

> What is far less clear is whether IRs will develop large, interoperable collections of published literature, as hope the advocates of open access. IRs are currently at an embryonic stage with only small, experimental collections of documents, but a clear message from the IRs is that one major hurdle—possibly the major hurdle—is overcoming faculty's inertia or indifference to self-archiving. It seems possible at present that IRs *per se* will fulfill a real and valuable function in supporting scholarly communication, research and teaching but that this function will be complementary to scholarly publishing rather in conflict with it. The impact of the wider open access movement is of course another matter.[25]

In 2004 and 2005, various authors and libraries sought to determine the true cost of OA for institutions, but this did not prove easy. As Holmström noted, "It is difficult for institutions to compare the costs and benefits of subscription-based and open-access-based journals since they charge for their services in totally different ways."[26] One measure used to determine cost for print journals is through cost-per-use data. Adapting the cost-per-use measure, Holmström proposed a method of measuring cost for OA journals by looking at the cost-per-article reading of OA articles. Once the cost-per-use (or cost-per-reading) has been determined for OA journals, then institutions have a method to compare traditional subscription-based journals to OA journals.

Cornell University Library (CUL) also tried to determine the true cost of OA publishing on an institutional level. CUL convened the Task Force on Open Access Publishing in January 2004, and the task force submitted its initial report in August 2004.[27] In the preliminary findings, the task force addressed the possible impact on CUL if OA were adopted broadly by Cornell authors. The task force determined that, if Cornell were to move completely to paying author fees in refereed OA journals instead of buying journal subscriptions, OA peer-reviewed journals "would not bring about cost savings for Cornell. In fact, taking into account the number of articles published by Cornell researchers each year and the average cost to publish a single refereed article, CUL would likely see its serial expenditures *rise significantly* if the library used its current subscription funds to pay for author fees instead."[28] Responding to the CUL report, Gass found the results invalid as the report failed to take into account the role of third-party funding agencies in paying author-side charges.[29] "In the United States," Gass noted, "many research funders like the National Institutes of Health already pay, directly or indirectly, for the publication of primary scientific articles."[30]

Addressing the sustainability of the current model of scholarly communication, Bosch outlined seven basic components needed for a sustainable business model for scholarly communication, and examined the OA model in terms of those components.[31] Bosch concluded that OA is promising, but added that "no business model exists for scholarly journal publishing that makes sense and is going to be sustainable for all participants."[32] Bosch's conclusion is reinforced by the findings of a report commissioned by the Joint Information Systems Committee (JISC).[33] As part of the report, librarians and publishers in the United Kingdom were surveyed on their preferences in OA business models when given a choice between seven different types. The findings indicated that, while everyone was dissatisfied with the current situation, no one model appealed to both publishers and librarians. A variety of models likely will continue to coexist.

Serials Management

During 2004 and 2005, issues around serials management generated a significant number of articles. Some of the issues related to the topic were shifting collections policies from print to electronic journals, managing licensing and subscription information, and providing and maintaining access. Threaded throughout the serials management theme was the relationship between publishers, libraries, subscription agents, and vendors.

Publishers, subscription agents, and libraries have built a collaborative system, one in which libraries place orders and pre-pay subscriptions to a subscription agent, subscription agents place the orders with publishers and pay the subscription fees, and publishers supply libraries with the ordered materials. This has been a trusted system, but occasionally the system is tested when one member of the system does not live up to expectations. Such was the case with the 2003 bankruptcy of subscription agent RoweCom

and its parent company, divine. "This is such a small community, and we are all so dependent on others to complete our respective missions," commented Geller as she traced RoweCom's history and troubles to its roots in the F. W. Faxon Company.[34] RoweCom had received almost $73 million in prepaid orders from libraries. Instead of placing the orders and paying publishers, the money paid to RoweCom was taken by divine. When the two companies went bankrupt, publishers and libraries were left to deal with the resulting chaos of trying to determine which subscriptions had been placed and paid by RoweCom.

Documenting the efforts of publishers and librarians to resolve the financial mess, Wiegand also offered ideas on how libraries might protect themselves in the future.[35] In the end, publishers agreed to fulfill a majority of orders. According to Panos, the lawyer representing RoweCom creditors, "Because publishers agreed to fulfill a majority of orders and thus assumed those claims against RoweCom, currently there are nearly $29 million in library claims and $45 million in publisher claims against divine."[36]

In the aftermath of RoweCom, one of the strategies employed by smaller libraries was to bypass subscription agents and order from publishers directly. Doubt about the need for subscription agents was acknowledged by the Association of Subscription Agents (ASA) in a statement made by Rollo Turner, ASA secretary general: "The ASA recognizes that the situation has put considerable strain on the trust that still exists between libraries, agents and publishers."[37] Eventually the strain placed on the relationship among libraries, agents, and publishers eased, for, as Geller noted, "the reality is that this intermediary is vital to the many-to-many relationship of libraries and publishers for all but the smallest library that can handle its own few subscriptions and the largest publisher that can afford to do its own customer service."[38]

With libraries licensing e-serials packages directly (or via consortia) through publishers and the aftershocks of RoweCom's bankruptcy, libraries were questioning the need for subscription agents. Not wanting to be squeezed out, subscription agents were trying to define their role in handling electronic serials. Few articles were published on this subject. One of the few, by Wang and Schroeder, examined the evolving role of subscription agents and outlined how agents could expand their services to provide a service hub offering publishers and libraries support in distributing and managing online serials.[39] Several presentations at the 2003 and 2004 NASIG conferences on this topic included "Creatively Coping with Your Subscription Agent's Bankruptcy" and the two-part session "Helping Manage the E-Journal Forest: Do You Need an Agent Any More?"[40]

Subscription agents were not the only group to come under scrutiny. Davis documented Emerald's (formerly MCB University Press) republishing of articles without notification from 1975 through 2003.[41] After searching articles in the Emerald database, Davis found evidence of republishing in more than seventy journals and, for some journals, entire issues consisted of republished articles. Republishing without notification goes against publishing guidelines outlined by the Committee on Publication Ethics and accepted by the Association of Learned and Professional Society Publishers. Publishers also have guidelines in place to ensure that original content is being published. Republishing without notification creates confusion in citations and it comes at a cost to libraries that may end up paying for the same content more than once.

In a letter to the editor in response to the article and to a letter by Davis, Howard reported that Emerald conducted a follow-up study of republishing in their journals and found 560 instances of original papers being republished, representing 1.1 percent of the total Emerald database.[42] Howard noted that, "87 percent of republishing took place in or prior to 1999" and that any republishing after MCB's name change to Emerald in 2001 was due to author or administrative error.[43] Emerald has adjusted its publishing practice, Howard acknowledged, to prevent further republishing errors, and articles republished now are fully attributed.

Electronic Journal Management

The number of electronic journals that libraries have access to through subscriptions, licensed collections, and databases has ballooned. Kyrillidou reported that 30 percent of materials budget expenditures at ARL libraries went to electronic resources.[44] In addition to increased spending on electronic resources, libraries have been shifting collecting priorities from print to electronic serials. One of the most clearly documented collection shifts in 2004 and 2005 was the description of the University of Nevada, Las Vegas Libraries' experience by Zhang and Haslam.[45] There are a number of reasons why libraries, like the University of Nevada, are focusing on the electronic format. User demand and preference for quick access is one of the main reasons for the change. Other reasons include potential library cost savings: e-journals do not have to be checked in, claimed, tattle-taped, marked, or bound, and they do not require physical storage space.

A research report by Schonfeld and colleagues examining the nonsubscription costs between print and electronic serials found that most libraries realize cost savings if journal collections are switched from print to electronic format.[46] The amount of the savings was dependent on how swiftly the changeover occurred, and how quickly technical services staff became proficient at the new workflows that e-journals create. The report, however, does not attempt to address the potential long-term cost of archiving electronic content by the library or through an outside organization.

Other factors may need to be taken into consideration before changing over to electronic-only access. Covi and Cragin found unintentional results from shifting collections to electronic serials that they termed intermittent holes and unintentionally masked information.[47] Intermittent holes, or gaps in electronic holdings, can occur when journal titles are removed from aggregations or change publishers. Libraries may lose access to the content that once was available to them, leaving a gap in coverage. With unintentional masked information, the electronic content is readily available, but not findable because of user interface difficulties, typographical errors, or inadequate search capabilities.[48] Due to these two problems, the authors find that "increasing electronic access to information could result in less intellectual access to knowledge" in the long run.[49]

The growth in electronic collections has left libraries struggling with how to manage online serials and provide access. As Ives explained, "The explosion in the availability of electronic titles, the dynamic nature of availability and access, and the 'overnight' popularity of electronic access have challenged our ability to deliver services and content at the level our users are demanding. Manual systems proved inadequate in keeping up with the workload."[50]

Vendors responded to libraries' electronic serials management needs by creating new products and services to provide A to Z e-journal title lists, coverage information, and better URL maintenance as well as to simplify user access to electronic content. A number of articles during 2004 and 2005 were devoted to libraries' experiences with implementing such publication access management services (PAMS) as Serials Solutions and TDNet, or linking resolution services such as Ex Libris' SFX. The vast number of articles in this area prohibits the author from mentioning all of them. A few representative examples are the description of Colorado State University Libraries' implementation of SFX, the use of Serials Solutions by Texas A&M University, and the University of Denver, Colorado's use of Gold Rush.[51]

As libraries come to rely on outside services to manage e-journal titles and coverage information, libraries expect the data to be current and accurate. As a result, the vendor products are updated regularly. However, as Chen noted:

> Just because full-text finding tool vendors update their products regularly does not mean that the lists are actually up-to-date, because full-text finding tool vendors get updates from content providers who have various updating schedules and practices, and thus are of varying quality. This has a significant impact on the quality of serials management systems, OpenURL link resolvers, and imported MARC records.[52]

Chen is not the only author to see the interdependence between libraries, serials management vendors, and content providers. Ives noted that Texas A&M University Libraries had "issues with the quality of the Serials Solutions datafeed. Serials Solutions is dependant [sic] in the first instance on getting good information from publishers."[53] Cochenour, Jaramillo, and Wilde mentioned similar issues with Ex Libris' SFX, finding SFX only as good as its knowledge base and its dependence on complete and accurate data from content providers.[54]

As a result of the need to communicate accurate and timely serials metadata between libraries, subscription agents, publishers, and PAMS, ONIX (ONline Information eXchange) for Serials is being developed and piloted by the National Information Standards Organization (NISO) and EDItEUR (the international group coordinating development of electronic commerce standards in the book and serials sectors). ONIX is a family of three standards: Serials Release Notification (SRN), Serials Online Holdings (SOH), and Serials Products and Subscriptions (SPS). Some of the anticipated uses of the ONIX formats are:

> communication of information about subscription packages available for a publisher or agent, information about journals contained in those packages, automated serials check-in, automated updates of online catalogs, population and updating of link resolver knowledge bases, automatic assignment of identifiers like digital object identifiers (DOIs), as well as other applications not yet envisioned.[55]

PAMS and link resolution services assist libraries in providing and managing access to their electronic serials. Libraries are looking to electronic resource management systems to track other, more administrative data, such as subscription and licensing information. Electronic resources management requires different workflows from print resources. Exploring other disciplines for newer ways of describing electronic resources management processes, Emery outlined five major areas of work: acquisitions, access provision, administration, support provision, and evaluation or monitoring of the access.[56] The data that libraries need to track is not part of the traditional integrated library system (ILS). For that reason, libraries have struggled with management as their electronic resources collections have expanded. Emery explained the difficulty in incorporating electronic resources management into existing integrated library systems:

> Part of the reason why there has been such a struggle to develop an electronic resource management tool is because what is needed is a tool that provides us with the ability to perform transaction processing, house-needed knowledge management elements, and provide room for decision support mechanisms. The merger of these three information systems requires a complete redesign or

> reconceptualization of what an integrated library system was originally intended for and there are developments underway by all of the major integrated library system vendors to develop tools that make attempts to fulfill all of these needs.[57]

One ILS that was completing development on an electronic resource management system during this period was Innovative Interfaces, Inc. Innovative partnered with several of its customers to develop and test their system, Electronic Resource Management. The partnership was an opportunity for both the vendor and libraries to create a management tool to fill a need in the library community. Reporting on the development partnership process, Grover and Fons offered both vendor and library perspectives on the relationship.[58] Harvell outlined the activities and responsibilities of the University of California, San Diego, as a beta test site for the Innovative product, and the implementation of it by Ohio State University and the Oregon Health and Science University—two other Innovative partners—was described by Tull and colleagues.[59]

By mid-2005, integrated library system vendors were not alone in developing and providing electronic resource management systems. Expanding on an earlier article by Duranceau in *Against the Grain* that compared ERM systems available through ILS vendors, Collins compared the ERM systems available and in development from ILS vendors, PAMS, subscription agents, and non-profit organizations.[60] The author offered advantages and disadvantages of going with integrated and stand-alone systems. In addition, Collins suggested ways that libraries can prepare for the implementation of an ERM.

ERM systems have not developed quickly enough to meet the needs of some libraries. A few libraries, such as the University of Florida Libraries and the University of Illinois at Chicago Libraries, have created their own electronic serials management system or tools. To better manage and provide access to licenses for electronic resources, the University of Florida Libraries scan licenses, save the scanned documents as portable document format (PDF) files, and make them available through links in the OPAC.[61] The University of Illinois at Chicago Library created a relational database, Database of Library Licensed Electronic Resources (DOLLeR), using Filemaker Pro to manage electronic resource subscriptions and licensing activities.[62] Lastly, Alan documented Pennsylvania State University Libraries' use of an in-house database, Electronic Resources Licensing Information Center (ERLIC), and their transition to using their system in conjunction with commercial products.[63]

Access

During 2004 and 2005, an increasing interest in how serials relate to the *Functional Requirements for Bibliographic Records* (*FRBR*)—a conceptual model for framing bibliographic relationships—and how *FRBR* concepts could be incorporated in cataloging practices, was apparent. *FRBR* is an entity-relationship model that describes an entity and its relationships to other entities. Within *FRBR*, four basic levels of abstraction apply to bibliographic resources. The four levels of abstraction, as defined in *FRBR* are: *work*, a distinct intellectual or artistic creation; *expression*, the intellectual or artistic realization of a work; *manifestation*, the physical embodiment of an expression of a work; and *item*, a single exemplar of a manifestation.[64]

Serials are rarely used to illustrate the *FRBR* model because they are aggregate works. They are comprised of smaller works that can exist independently, a situation leading to fundamental questions: "What is a serial work?" and "Does *FRBR* apply to serials?" Three very thoughtful studies of serials and *FRBR* were published in 2004 and 2005. Jones examined the *FRBR* model as it applies to continuing resources and found four problematic areas.[65] The four areas mentioned by Jones are: "(1) the nature of the *work* in *FRBR* and Anglo-American cataloging; (2) the hierarchies used for expressing bibliographic resources; (3) the level of abstraction at which bibliographic resources are described; and (4) the varying techniques for expressing relationships among bibliographic resources."[66]

In another article, Riva mapped MARC 21 bibliographic format linking entry fields (fields 760-787) to *FRBR* and to Tillett's taxonomy of bibliographic relationships, including the Smiraglia extension to it.[67] Riva's mapping suggests that future enhancements to MARC coding might be needed to better distinguish bibliographic relationships. In addition, such an exercise is useful when mining existing MARC data for use in *FRBR*-aware databases. In the third article, Antelman provided a thorough look at the title main entry currently used to identify a serial work, the problems inherent with using the title as the identifier, and how *FRBR* or other entity-relationship models might be used to identify a serial at a more abstract level.[68] These three articles will surely begin an ongoing discourse on *FRBR* and the application of *FRBR* principles in relation to serials.

Moving from the theoretical to the practical, articles published during 2004 and 2005 about serials cataloging mark a period of change and adjustment to new cataloging rules, cataloging practices and workflows, and serials cataloger responsibilities. Two events had an impact on the serials cataloging literature. The first was the late 2002 update to the *Anglo-American Cataloging Rules*, 2nd ed. (*AACR2*), especially the rules regarding major and minor title changes.[69] Assisting others in navigating serials major and minor title changes, Garner, Collins, and Shadle provided explanations and examples to illustrate the application of the rule changes that were part of the 2002 update.[70] The authors also explored the reasons behind the title change revisions, goals of the revision, and the impact of the revisions on libraries.

The second event was the adoption of the aggregator-neutral record established by the Cooperative Online Serials Cataloging Program (CONSER) in 2003. As in other areas of the literature, electronic serials were having an impact on serials cataloging and cataloging workflow. Cataloging treatment options for online serials, single or separate records, were outlined by Leathem.[71] The single record option allowed online access to be added to the print record and was a quick way to add e-journals to the catalog. Prior to July 2003, using the separate record cataloging option meant creating records for each online manifestation of a serial. A single title could be available from several online providers, each with its own record.

The proliferation of records for online serials in library catalogs and in the bibliographic utilities, as well as patron confusion, prompted the adoption of the aggregator-neutral record by CONSER in July 2003. The aggregator-neutral, also referred to as Option B+ prior to adoption, calls for a single record to represent all electronic versions of a title. Young, one of the initial creators of the aggregator-neutral record proposal, provided background on the aggregator-neutral record and outlined CONSER practice for constructing an aggregator-neutral record.[72] Illustrating the differences between past practice and the aggregator-neutral record, Shadle presented MARC records for separate records based on provider and for the aggregator-neutral record.[73]

The adoption of the aggregator-neutral record was eagerly anticipated by catalogers. Results of the CONSER Aggregator Survey indicated almost unanimous support among survey respondents for the aggregator-neutral record.[74] Results of another survey, one addressing serials cataloging practices at academic and research libraries and reported by Chen and colleagues, indicated that some libraries were "monitoring CONSER, impatiently awaiting the implementation of the CONSER B+ skeletal record."[75]

Cataloging policy changes were not the only changes resulting from access to increasing numbers of e-journals. The number of e-journals available to libraries and continual maintenance needed to keep coverage information and URLs current pushed manual cataloging and maintenance of bibliographic records beyond what many libraries were capable of handling quickly and efficiently. The results of the spring 2003 survey of serials cataloging practices reported by Chen and colleagues noted growing use of access services, such Serials Solutions and SFX, and the use of vendor-supplied catalog records. The trends identified by Chen and colleagues were echoed by Collins in interviews with serials catalogers in 2005.[76] Collins interviewed ten serials catalogers from eight academic libraries and provided accounts of how the eight libraries have changed their cataloging policies and practices to streamline the e-journal cataloging process.

Collins identified three areas of change in serials cataloging at the end of 2005: changes to "the MARC record, record maintenance, and the job responsibilities of the serial cataloger."[77] As with Chen and colleagues, Collins found that the academic libraries represented in the interviews had changed their manual cataloging practices because of e-journals. At least one library, Clemson University, changed its cataloging policy from single records to separate records for print and online serials in order to facilitate loading vendor records. Automating record creation and maintenance, these libraries found, "has provided a cost-effective means for streamlining the cataloging workflow and keeping pace with constant record changes."[78] Some of the methods employed were the use of record sets from vendors, bibliographic record services, and local scripts to create records based on ERM data and data from e-serials management services. In another example of automating e-serials cataloging, the article "Rehabilitating Killer Serials" gives an account of Cornell University Library's automated process for creating and maintaining abbreviated e-journal records based on title and holdings data from Serials Solutions.[79]

Another trend noted by Collins was the changing roles and duties of serials catalogers.[80] As more online journals are being cataloged by automated means, serials catalogers are involved with record loads, writing local scripts, and maintaining e-journal title information with access management services. Traditional cataloging skills are still being used by serials catalogers, but online journals are driving serials catalogers to develop skills in other areas in order to effectively meet the needs of library users.

While others were trying to figure out how to catalog more standard online serials (i.e., those e-serials closely resembling print serials), others were looking at providing access to less mainstream serials, such as zines, e-zines, and blogs. Stoddart and Kiser identified zines as publications that act as the "unfiltered voice of the common person," which are published and distributed independently.[81] Stoddart and Kiser acknowledged that defining zines is difficult to do. However, the authors warned that zines should not be confused with e-zines. E-zines are similar, but different, and equally difficult to define. Stevens, while examining the long-term stability of literary e-zines, noted that "there is little agreement as to what an e-zine is—is it the online version of a zine, or can it be any online publication at all, including newsletters, self-help/advice sites, or even *The New York Times*?"[82] Despite the difficulty in formulating definitions of zines and e-zines, Stoddart and Kiser, and Stevens indicated that zines and e-zines have value as information resources and should be included in library collections. Stoddart and Kiser also offered suggestions on how to obtain zines and how to provide access to them.

Zines and e-zines can be irregular in their publication and may cease publication at any time. When zines stop

being published, past issues are still available because of their physical nature. Access to e-zines after they cease publications, however, is uncertain. In order to reduce resources spent on selecting and cataloging unstable e-zines, Stevens identified a list of factors that might indicate an e-zine's longevity and identified a set of e-zines to use in a study.[83] In a follow-up article, Stevens and McCord provided analysis of the data from the study and provided a predictive model for determining e-zine longevity.[84] The Stevens and McCord model was able to select 100 of the 116 e-zines considered stable and correctly screen out all e-zines that had ceased or were considered unstable. Five questions can help identify e-zines that are likely to be stable and can be used by libraries when selecting e-zines for inclusion in their collections. The questions range from whether or not an e-zine is available at its stated URL to questions about frequency of publication and where the e-zine resides on the Web.

With "TalkLeft, Boing Boing, and Scrappleface," by Moeller and Rupp, the issue of collecting and providing access to blogs via the catalog made its debut in 2005.[85] Previous writings about blogs have been about blog use by libraries and librarians. The authors provided examples of how blogs are used as information resources, reasons why libraries might want to include them in their collections, and how to catalog blogs. Blogs fit the definition of a continuing resource, but whether a blog is a serial or an integrating resource requires careful examination of the blog being cataloged.

In addition to the bibliographic record, serials holdings records also received attention in the literature. The holdings record is governed by two standards, the ANSI/NISO Z39.71-1999 Holdings Statements for Bibliographic Items (Z39.71) and the MARC 21 Format for Holdings Data (MFHD). Z39.71 governs content and display, and MFHD governs the encoding and communication of holdings records. Wanting to find out how libraries were recording serials holdings and why libraries were choosing to record holdings in a particular manner, Moeller and Lu conducted a survey on the implementation and use of MFHD.[86] The authors found that almost 91 percent of the respondents used holdings records to display serials holdings, and that detailed holdings (Z39.71-1999) were the most commonly used expressions for the holdings. Just more than half of survey respondents, 61 of 117, indicated that paired coded MARC fields were in use at their libraries. When asked why the paired coded fields were being used, the predominant reason was to ease future ILS conversions—not a surprising answer, as the survey was taken at a period when many libraries had converted or were about to convert to a new ILS. Interestingly, several of the other top reasons for using paired coded fields had to do with possible future benefits.

Moving beyond local holdings records, Ashman studied the use of serials union listing records in OCLC Online Computer Library Center's WorldCat database.[87] Although union lists have been used primarily to facilitate resource sharing, they also can be used to provide reference services and serve as a tool for collection management. Prior to enhancements made to WorldCat in 2002, users of the database could only tell if an institution held a serial. The only information that displayed was the library's name and OCLC symbol, considered Level 2 holdings according to MFHD. With the enhancements, WorldCat users now are able to see volume-specific holdings (Level 3 holdings) if libraries have elected to create the union listing records. Ashman's study examined how often libraries enhanced their Level 2 holdings with volume-specific information and found that "academic libraries had union listing records for 77.6 percent of the serial titles that they had cataloged, but the examined ARL libraries had union listing statements for only 46.85 percent of their cataloged serial titles."[88] Ashman concluded that more libraries may upgrade their holdings in WorldCat due to another OCLC development, the ability to batch load serial holdings.

Conclusion

Electronic journals permeated the major themes of cost, management, and access outlined in this review. The impact of online serials on publishing, libraries, and intermediaries has been tremendous. As libraries began turning away from the Big Deal, the dialogue around OA increased. Repositories and open access journals were promoted as ways to provide an alternative to traditional publishing and, hopefully, as a way to slow journal price increases. The serials literature of 2004 and 2005 shows libraries struggling to cope with providing access to and managing electronic journals. Libraries were implementing new products and services, such as link resolvers, A to Z lists, and ERMs, aimed at providing that control and access. These services and products are provided by e-serials management intermediaries, a new group in the scholarly communication circle. In addition to the new e-serials management intermediaries, traditional subscription agents were redefining their work to include electronic journals and offering libraries services for managing e-journal subscriptions.

A fourth theme interwoven throughout the literature is the connections among all groups in the scholarly communication circle—authors, publishers, libraries, and vendors. The literature review found evidence of those connections at work in the communication and collaborations between libraries and scholars; libraries, subscription agents, and publishers; libraries and ILS vendors; and libraries, e-serials management service providers, and content providers. Libraries communicated with faculty, who are authors and editors, about journal pricing issues, open access, and

repositories. Successful communication allowed a number of academic libraries to walk away from the Big Deal, with the full support of their faculty senates. It also generated further discussion and promotion of alternative publishing models.

An integrated library system vendor partnered with libraries to develop a new product to respond to the growing need for a system to manage electronic resources administrative data. Libraries and publishers worked together to find the best resolution to the divine/RoweCom financial crisis. Efforts are underway, with involvement from all parties, to create standards for communicating serials metadata. Hopefully, those efforts will pay off in improved communication between content providers, libraries, and e-journal management services as they work to provide users with timely and accurate information about the title availability and full-text coverage information for those titles.

A few subjects were not well-represented in the serials literature, mainly in the areas of serials acquisitions, and the relationships and communication between libraries and third-party service providers, and between those intermediaries and content providers. The author was surprised that more was not written about serials acquisitions work. With libraries changing collections from print to electronic formats, little was written about how print serials acquisitions work has been affected, how staffing was altered, and whether any activities were discontinued or added to acquisitions work.

Another topic receiving surprisingly little attention in the peer-reviewed literature was the relationship and communication between libraries and subscription agents. A number of conference presentations and a few articles addressed the subject; perhaps more will make their way into the literature soon.

Finally, accurate and timely communication of serials metadata among libraries, e-serials management service providers, and content providers is crucial to supplying library users with the information they need. Little, however, has been written on how often title lists and coverage data are published by content providers, the accuracy of the data when it is provided, and how frequently the information is updated. The need for improved and standardized communication of serials data to various interested parties is evident and will be more important as new tools are developed that rely on the same coverage information.

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General Procedures Used in Compiling the Index
The following types of entries are included:
a. authors—of articles, reviews, and letters
b. titles—of articles and of articles about which letters were published
c. subjects—of articles and of books reviewed
Subject entries for individuals and corporate bodies are identified by "(*about*)"; letters are identified by "*letters*". Reviews are indexed by name of reviewer and by subject of the work reviewed, identified by "*reviews*". They are also listed by title under the heading "Books Reviewed".
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