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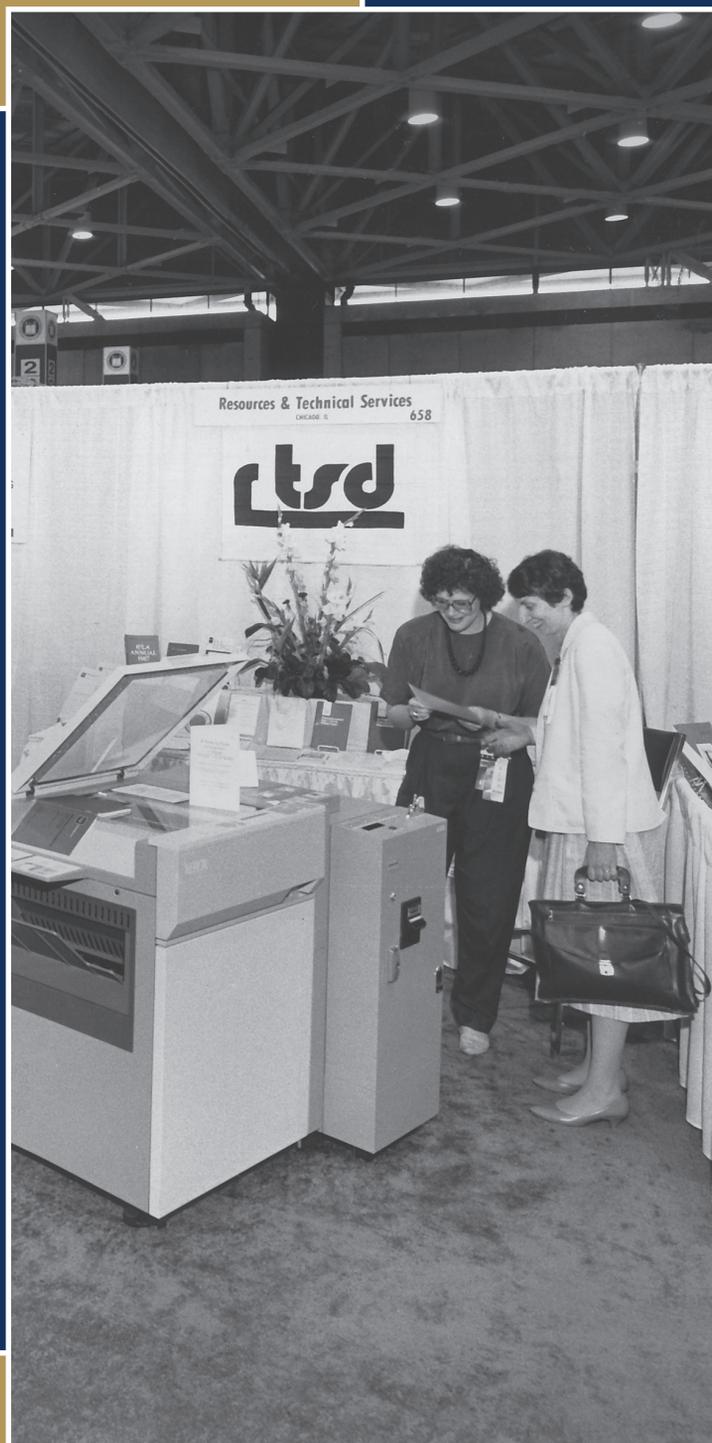
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**Cognitive and Affective Processes
in Collection Management**
Brian Quinn

Toward Releasing the Metadata Bottleneck
Amanda J. Wilson

**A Review and Analysis
of Library Availability Studies**
Thomas E. Nisonger

The Challenges of Change
Shawne D. Miksa



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ISSN 0024-2527

January 2007

Volume 51, No. 1

Guest Editorial

Restrategizing Bibliographic Services and the One Good Record
John J. Riemer

2

ARTICLES

Cognitive and Affective Processes in Collection Management

Brian Quinn

5

Toward Releasing the Metadata Bottleneck

A Baseline Evaluation of Contributor-Supplied Metadata
Amanda J. Wilson

16

A Review and Analysis of Library Availability Studies

Thomas E. Nisonger

30

The Challenges of Change

A Review of Cataloging and Classification Literature, 2003–2004
Shawne D. Miksa

51

Index to Advertisers

68

Book Reviews

69

Instructions to Authors

75

ABOUT THE COVER

Resources and Technical Services Division exhibit booth from the 1980s. In the spirit of celebrating *LRTS*'s 50th anniversary, its past, and its future, enter the *LRTS* cover photo description contest. For details, see page 49.

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Guest Editorial



Restrategizing Bibliographic Services and the One Good Record

By John J. Riemer

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A whirlwind of reports, product announcements, and spirited discussions swept over the library landscape in 2006. Lorcan Dempsey's blog announced the posting of the University of California Bibliographic Services Task Force (BSTF) report and the debut of the new Endeca-based online catalog at North Carolina State University, which exemplified many of the BSTF recommendations.¹ The Library of Congress–commissioned Karen Calhoun report followed a couple of months later.² The Library of Congress (LC) described a priority shift to “access to content rather than access to description.”³ LC's discontinuation of series authority work was the first change in bibliographic control along these lines.⁴ At least one ILS (integrated library system) vendor announced development of a new product in response to many of the shortcomings of the existing systems. Among other benefits, Ex Libris's Primo is expected to permit unified searches of material traditionally siloed in separate databases and enable users to access library materials from within course-management systems and institutional portals.⁵

Much in these reports and developments was both exciting and disturbing to library staff. In the words of one colleague reading BSTF's interim report, “I must say it really shook up my world when I read it. Not that there were any surprises—it was very much mom-and-apple-pie stuff that has been said before—but somehow you voiced it in a more compelling and urgent way.”⁶

What Users Want

These events and the subsequent discussion stemmed from an earnest look at a question reminiscent of Freud, “What do users want?” The following assertions have been made on behalf of users.

- Users want simplicity and immediacy. Users are accustomed to a single search box on an entry screen, without an obligation to categorize search keywords.
- Users want the search interface to be intuitive; this does not mean they want the response to their searches to be simple-minded. On the contrary, as Kautzman and Ryan have noted, “An intuitive interface is not by definition ‘dumbed down’ or anti-scholarly.”⁷
- Users benefit from prevention of dead-end searches, provision of enhancements like tables of contents and cover art, and navigation assistance that groups results and enables jumps to “more like this.”

- Users want one system to search, to cover a wide information universe. They frequently do not know about the separate silos that exist and what is in each; even when they do, having to search them one at a time is unwelcome.
- They expect immediate access to full-text online resources wherever possible. For other materials, they want a full range of fulfillment options, not restricted to those services the library controls.
- They appreciate the opportunities to annotate, review, and “tag” resources, as well as share them with others. Users like results sorted by relevance, a key component of which is how others like themselves have used the resources.
- Instead of having to come to the library, physically or virtually, they would appreciate the above services being delivered to where they are—be it an institutional portal, course-management system, commercial search engine, and other mechanism.

Choices in How We View Metadata

Libraries determined to reform their operations and modernize themselves in response to these demands and expectations have a couple of choices of how to regard metadata. One view sees library metadata as overkill in light of what users of commercial search engines can be satisfied with. Any search functionality or data element not enjoying significant usage is a prime candidate for elimination. The granularity of library metadata probably is responsible for presenting too many searching choices on online catalog screens. With the arrival of e-resources in library workloads, the current methods of resource description appear less and less scalable. The availability of full-text online tempts the conclusion that summary-level metadata is unnecessary. The large expense going into a behind-the-scenes cataloging operation represents an opportunity cost for libraries, in terms of what they could be doing for more directly beneficial user services. If users are abandoning the catalog for Amazon and Google, it is an indictment of the outdated practices and products of cataloging activity.

Another view sees metadata as the library’s unique “value add” in this information age. In Web 2.0 terms, metadata gives those who use it a competitive advantage in the information marketplace. The richness of the metadata creates opportunities for providing a wide variety of library services. Bibliographic records support more than searching catalog inventory.⁵ In a Web environment, they can provide a rich set of possibilities for browsing relationships that a title has with related material. Reasonably consistent data can support precise report writing against a file of bibliographic records, along parameters not offered in live catalog searching.

A solution to poor-quality experiences using existing online catalogs is separating the front-end interface from the valuable back-end data store. An even greater means of justifying and recovering the cost of creating metadata is capitalizing on the expanding markets for it. In the future, online catalogs will be just one of the places that library metadata goes.

At the June 2006 Technical Services Administrators of Large Research Libraries Discussion Group meeting in New Orleans, an update on the efforts to make library data available to commercial search engines elicited the observation that receipt of the initial metadata increased the appetite for more of it. At an August 2006 Digital Library Federation workshop on implementation of the Open Archives Initiative, presenters confirmed the trend is moving away from seeking lowest common denominator, unqualified Dublin Core toward seeking whatever richer schema a data provider happens to have.⁹ Another insight from the same workshop is that metadata’s role does not end once a described resource has been discovered and delivered. Metadata also supports the use of the resource, enabling a user to obtain a citation of it, as well as to find resources related to it. For nontextual objects, the metadata explicates what the user has found.

The benefits of library classification systems seem to be steadily growing over time. Classification can provide a unified browse of library resources on similar subjects—those on open shelves, in use, in remote storage, or in digital format. High-level subject browse categories can be created for subsets of the collection such as e-resources, by mapping from existing classification data. When a set of subject browse categories needs to change, particularly being made more or less granular, this can be achieved by remapping from the classification, versus starting from scratch. Powerful analysis of collections and assessments for accreditation are supported by classification available in cataloging data.

Changes We Need to Make

While this future for library metadata looks very bright, there are some changes we will need to make. If we wish to sustain the level of metadata we are accustomed to now, we need to be willing to change a long-standing cataloging model. Libraries have historically approached new-title cataloging as starting with the existing bibliographic utility record and custom editing a copy of it for the local file. Revisions to existing cataloging records often are made directly in the local file. Some of the original cataloging energy involved was channeled back to the bibliographic utility’s record, through the Program for Cooperative Cataloging, the OCLC Enhance program, and others.

At a regional or national level, we need to be willing to start working in a communal file, where the work on bibliographic records need only be done once. Imagine the savings and efficiency that could be gained if serial title changes, authority work to maintain headings, and other upgrades to data could be done once and automatically shared by others. Think about the prospects of having additional resources for placing more material under better bibliographic control, gearing more of our cataloging toward more original and unique work, and being able to serve a wider variety of research needs. We have to be willing to cooperate in using each other's records (largely) as-is, to agree on standards, to trust each other.

Libraries should not always feel that they have to be the ones to provide the metadata. If there is similarity in the uses made of bibliographic descriptions by publishers, vendors, and libraries for their inventories, and if there is significant overlap among needed data elements, then it makes sense to pursue a single metadata creation effort whose results we all can use. A good example of this is the recent arrangement between North American libraries and Casalini Libri to share a national-level bibliographic record.

The model of relying on national library provision of high-quality cataloging records may be shifting to a wiki. We will need to rely on ourselves, together with strategic partnerships with others, for sustaining a rich underlying metadata that can guide users to many bibliographic services. Users—and fulfillment of their wide range of needs—depend on good metadata for finding, identifying, selecting, and obtaining resources.

Call this the vision of the One Good Record. The least scalable aspects of metadata are the local variation and the duplication of effort.

The more a library goes it alone in metadata creation policies and efforts, the sooner it will run up against the limits of what it can sustain and the sooner it will feel the need to retrench the content of the record.

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Cognitive and Affective Processes in Collection Development

By Brian Quinn

The selection process in collection management has been characterized as based primarily on logical, rational thinking processes. Psychologists, however, have discovered that judgment and decision making are not exclusively cognitive functions. They depend instead on a complex interaction between affect and cognition, feeling and thought. This paper attempts to explore some of these interactive processes and how they potentially influence the selection process in collection development. Some implications for how selectors approach their work are discussed as well.

Many of the most important decisions that are made in libraries involve collection development and management. Decisions about whether to add new titles or to cancel existing ones are often complicated and stressful because they frequently involve the commitment or redistribution of limited funds. Often the outcome of the decision affects not only librarians but also stakeholders outside the library. For academic libraries, these constituents include faculty, students, and sometimes the community. Decisions by public and school librarians are often made with parents, school boards, library trustees, and municipal officials in mind.

Given its importance, librarians have attempted to analyze the process of decision making for collection development. This process has been depicted in the library literature as being a thoughtful, reasonable, rational one that is fundamentally logical and deliberative. Psychologists have examined decision-making processes in much more depth and detail than librarians. The psychological literature indicates that decision making is not simply a cognitive or thinking process. Rather, it depends to a significant extent on affect or emotion. The purpose of this paper is to examine the psychological research on decision making and explore the implications of revisioning collection development decisions as being not simply matters of the head but also matters of the heart.

Standard works on collection development generally depict the selection process as a mental process but not an emotional one. Hamlin states that selection requires the selector to understand the needs of the user and know which resources to consult to locate appropriate material.¹ The selector must be able to differentiate suitable sources from unsuitable ones, and evaluate the quality of the materials. The decision-making process also involves being able to reconcile the amount and cost of the material under consideration with the budget that the selector has to work with. A selector also needs to be aware of how much material the library already owns on a topic and whether further material is needed, and also if similar material may be available in a nearby collection. The selection process that Hamlin depicts is thus exclusively cognitive, with no reference to affect or emotion.

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A similarly strong emphasis on the cognitive aspects of decision making can be found in Atkinson's hypothetical model of the selection process.² Selection decisions are based on the context in which the selector places a work. The elements of the citation itself, such as author, title, publisher, and date, provide the syntagmatic context. The ability to recognize these elements and how they influence one another is an important aspect of the selector's thought process in decision making. Additional cues that help the selector evaluate the work are subject headings, annotations, reviews, the work itself, and the user, which are referred to as the contexts of supplementation. Recognizing the importance of other citations that may be found with the citation in question and the source in which the citations are found may provide indirect supplementation. The third context is known as the contexts of resolution, which itself includes three contexts. The first of these, the archival context, refers to the selector's understanding of what is already available in the collection. The communal context is based on the selector's knowledge of the needs and interests of the community of users being selected for. The thematic context involves the selector's understanding of publication trends in the subject matter. The final decision-making process consists of the selector connecting or relating the elements of the citation to the source and to the contexts of resolution. The core mental processes mentioned in this model—recognition, understanding, and relating—are cognitive or thinking processes. Affect or emotion does not seem to play a role.

Although less theoretical than Atkinson's model of selection, the six categories of selection criteria proposed by Rutledge and Swindler are similarly cognitive.³ These include discerning the subject of a work, evaluating its intellectual content, predicting the amount of use a work will get based on the selector's knowledge of users, understanding how the work relates to the rest of the collection, bibliographic considerations such as reputation of the publisher, format of the material, and language of the work. To further rationalize the selection process, the authors prioritize the criteria and refine the process by creating three priority levels: the library must, should, or could add the title. They then attempt to quantify the model so that each criterion receives a weighting based on its overall importance and each title can then be given a numeric score. In this model, selection is reduced to a rational calculus, a precise science devoid of any affective dimension. Although they characterize their model of selection as "holistic," it is exclusively based on a reasonable, rational, mental model that seems reductionist because it does not take into account emotional processes.

In her book, *The Decision-Making Process for Library Collections: Case Studies in Four Types of Libraries*, Kovacs attempts to identify the thought processes involved in selection by categorizing them according to seven routines:

recognition, diagnosis, search, design, screening, evaluation/choice, and authorization.⁴ The kinds of thought processes she describes, however, are cognitive. Recognizing gaps in the collection, searching catalogs, and scanning reviews, determining the characteristics of materials needed, identifying the optimal way to obtain the material, identifying the most effective source, making a final evaluation of the source, and then authorizing it, are all processes that involve thinking rather than affect or feeling. Kovacs advises selectors that they need to avoid unconscious decisions, and that selection is based on awareness of needs and materials rather than intuition. Her model emphasizes cognitive processes to the exclusion of affective ones.

Mental processes related to decision making in the selection process are described by Williams, who believes that a selector must possess the ability to recognize important works in a field, which she labels a cognitive skill.⁵ She describes recognition as a function of memory and discusses various psychological theories of how memory works. Williams suggests that novice selectors create written lists of canonical authors and works to prime their memories for recognition of important works. The author draws openly from the literature of cognitive psychology in describing schema theory and how a selector's prior knowledge will improve the ability to recognize and recall information about related material. She makes no mention of affective processes in her model.

The highly rationalized, cognitive model is perhaps carried to its extreme in the optimized model of decision making outlined by Losee.⁶ He draws upon logic, mathematics, and economics to suggest that materials selection could be computerized and done by a machine. He notes that human decision making may not be completely rational and that selectors may engage in satisficing behavior that, while not optimal, is adequate enough to meet a certain standard established by the selector. Optimal selection decisions are rational ones that result in titles of maximal utility to the user, and selectors can estimate the probability of a title's value from the reputation of the publisher, the author, or from reviews. This model relies heavily on formal reasoning and logic and does not acknowledge any emotional or affective dimension of human behavior.

In his book, *Developing Library and Information Center Collections*, Evans outlines a system of thinking that he recommends selectors use for each title.⁷ It is a series of questions the selector asks him- or herself, which includes questions about whether the subject of the title falls within the scope of the collection, whether it is of interest to the library's users, how much similar material the library already owns, whether the price of the title is within the selector's budget, what the reputation of the author or publisher is, and whether the source of information describing the title is valid. The overall approach is a systematic and logical one

based on cognitive thought processes rather than affect. The Evans model outlines a process of thinking through the significance of a title, and there is no reference to emotion.

A similar approach to selection is taken by Clayton and Gorman in their work, *Managing Information Resources in Libraries: Collection Management in Theory and Practice*.⁸ In addition to listing some basic criteria for selection, such as author, scope and treatment of the work, organization, and format, they also discuss some general principles related to the selection process. A selector must keep informed about the selection process itself by continually reading the library literature. The critical factor in effective selection is a thorough understanding of the library's goals, the collection, and those who use it. The selector should have a firm grasp of how publishers and booksellers operate, and learn the reputation of each. Becoming familiar with sources of reviews and the reviews themselves is important, along with knowledge of bibliographies. Well-researched and independent decisions are a goal to be strived for consistently and can be achieved by following these principles. The emphasis of the authors on learning, understanding, and knowledge would suggest that they see selection decisions as cognitive in nature. No reference to emotion or affect is included in their explanation.

Knowledge alone does not result in skilled selection; experience and intuition also play a role according to Johnson in her book, *The Fundamentals of Collection Development and Management*.⁹ However, knowledge in the form of familiarity with selection tools, as well as understanding the goals of the library and the needs of its users, is fundamental. Other kinds of knowledge, such as familiarity with collection-development policies and with the subject areas being collected are also basic. Drawing on Peter M. Senge's distinction between learning and mastery, the author believes that collection-development skills can be learned, but that mastery only occurs with practice.¹⁰ The beginning selector must make a diligent and continual mental effort to learn and follow correct practices before they become automatic or unconscious. Over time the practices become so internalized that they are no longer conscious but become subliminal and effortless. The emphasis on knowledge, skills, theory, and practice indicates that this is primarily a cognitive model, and that emotion or affect is not a factor.

Making decisions about whether to purchase a book, cancel a journal, or add a database or aggregated package is often fraught with uncertainty and ambiguity. Except in rare instances in which a title obviously fills the need of a faculty member or student, the subject selector will face a host of questions that are not always easily answered. Who will use the resource? How frequently will it be used? Will users like it? Could the funds be better spent on a different resource? Does it fill a gap in the collection? Which format

is best? How does it compare with similar titles? A selector may have difficulty processing the many variables and doing so quickly.

Given the high level of uncertainty inherent in making collection management decisions, the process cannot be regarded as strictly logical, analytical, and rational. A significant element of subjectivity and guesswork makes collection development decisions vulnerable to typical human shortcomings such as emotion, bias, impulsivity, and caprice. In order to avoid mental overload and fatigue caused by trying to take into account all the factors that should be considered in making good decisions, psychologists have discovered that people make use of heuristics, which are cognitive shortcuts or rules of thumb designed to simplify and expedite the decision-making process.

Such simplifications can lead to cognitive biases. For example, a selector might encounter two resources that have similar content and format, but one is more expensive. If the selector believes that the higher in quality a resource is, the more expensive it will be, he or she may decide to purchase the more expensive resource. Biases may be affective as well as cognitive. People, experience, events, and objects are embedded in memory and are emotionally charged or vested with positive or negative associations and feelings. If a selector encounters a title having to do with structural equation modeling, and he or she has read books before on this topic and found them to be boring or poorly written, the memory of those experiences along with the negative emotions associated with them may predispose the selector to be reluctant to select the book or to select related titles for the collection.¹¹

This suggests that the decision-making process in collection development is not only not exclusively logical or rational; it is also not simply cognitive. In addition to thinking or cognition, emotion or affect is also involved. The relationship between these two psychological factors is a subject that has attracted the attention of psychologists and philosophers as far back as Plato and Aristotle. These early Greek thinkers tended to consider reason—their term for cognition—as being in conflict with passion, which was the ancients' equivalent of affect.

Plato thought that reason was the higher of the two functions. In his view, reason served to keep passion under control. Aristotle took this idea even further by suggesting that passion depends on reason. He defined anger, for example, as a form of belief that one was being treated unfairly.¹² An emotion such as anger is thus the result of certain thoughts or cognitions that may ultimately lead to aggressive behavior.

The debate over the relationship between cognition and affect continues among psychologists and philosophers. Psychologists have recently shown a growing interest in the role of emotion in the decision-making process. Some

researchers now believe that affect not only influences cognition, but that emotions steer cognitive activity in particular directions. Affect predisposes thought toward certain emotionally congruent interpretations, plans, and actions.¹³ As a selector thinks through a collection-development decision, his or her thoughts may be influenced toward a particular outcome as a result of experiencing a particular emotion or mood.

Research on Affect and Decision Making

Psychologists have compiled a variety of experimental evidence that suggests ways in which emotions may influence decisions. One such experiment involved 165 undergraduate students who were asked to decide whether they wanted one of two snacks as a reward for participating in the study: a piece of chocolate cake with cherry topping or a fruit salad.¹⁴ Before choosing, the students were divided into two groups. One group was asked to memorize a seven-digit number and the other, a two-digit number. The results of the experiment indicated that the students who were required to memorize the seven-digit number chose the chocolate cake, while the students who memorized the two-digit number chose the fruit salad. The researchers who conducted the experiment saw this as an indication that when students' cognitive-processing resources were consumed by having to memorize the seven-digit number, they made their decision based on affective reactions and chose the chocolate cake. Their impulsive emotional side was able to gain the upper hand in the decision-making process because their rational analytical side was preoccupied with remembering the seven-digit number. On the other hand, the students who only had to memorize the two-digit number had more cognitive resources available to analyze their decision more thoroughly, enabling them to make a prudent, rational, sensible choice of the healthier fruit salad.

The results of the experiment have interesting implications for collection development. The experiment suggests that librarians should tend to make more prudent selection decisions to the extent that they base their decisions on cognition rather than affect. Any aspects of work that are allowed to interfere with cognitive processing such as competing demands, deadlines, or budget concerns may be likely to result in poorer quality, more affect-based decisions. Selection that is affect-based is more likely to involve irrationality and impulsivity, which generally results in poor choices. The selection process in collection development, thus, may be only a logical, rational, analytical process to the extent that cognitive resources are available and are not consumed by other tasks or issues.

Emotions, Moods, and Decisions

Psychological research suggests that different types of affect have different kinds of effects on cognition. An important distinction is how emotions differ from moods. Emotions generally tend to be relatively brief but strong emotional states that are easily recognizable and have an identifiable origin and significant cognitive associations such as precipitating incidents and strategies for what to do. Moods, in contrast, tend to be less intense, less focused on a particular incident, and longer in duration than emotions. One is more likely to be in a good mood or bad mood without readily being able to attribute the mood to a particular cause. Selectors need to pay attention to their mood states when making collection-development decisions. Individuals tend to be less conscious of their moods and do not monitor them as closely as emotions, so that the effects of moods on decision making can be more subtle but also more sustained and more significant precisely because they are less subject to a person's awareness. Emotions and moods also affect one another.¹⁵ Strong emotions can leave a person in a particular mood after they subside, just as a particular mood can predispose someone to certain kinds of emotional reactions.

Affect is important to cognition in decision making because it influences what and how people think. Psychologists suspect that positive moods may serve to compromise decision making by reducing the attentional capacity of the person. Positive moods may also activate positive memories and associations that serve to distract a selector from pertinent information about a title. Individuals in a positive mood may also consciously seek to maintain this pleasant state by seeking to avoid any information that may introduce critical, negative elements or require mental exertion or complicated cognitive processing. The amount of concentration necessary to make a careful considered selection may not be compatible with feeling good.¹⁶ From an evolutionary standpoint, positive moods may reduce cognitive activity because they indicate to the brain that one can relax and feel protected, while negative moods may trigger a call for alertness or vigilant thinking. A combination of these processes may be involved, depending on the particular situation.

Extrapolating from this, it seems plausible that the more positive a selector's mood, the more likely it is that the person will adopt a superficial, disengaged process of approaching a collection-development decision. Happy selectors will tend to downplay the complexity of the decision and make use of mental shortcuts or generalizations. They will tend to make decisions more quickly and may not bother to consider all the factors that may be involved in making a decision. They may not make the effort to scrutinize a title carefully, so that any shortcomings are more likely to be revealed.

Affect may influence cognitive processes that are important to decision making in other ways, such as memory. Memory is important to decision making because selectors use it to inform decisions. Selectors often draw on past experience to make decisions which may include subject knowledge or knowledge about librarianship, and it is memory that plays a critical role in supplying this information. The affective state of an individual tends to facilitate the recall of emotionally-congruent material stored in the person's memory.¹⁷ The selector who is in a negative mood and feeling depressed or anxious may more readily recall negative reminiscences because they match his or her emotional state.

In a study conducted of college students, participants were asked to study words with positive, negative, or neutral associations.¹⁸ They were then asked to produce associations to the material they had studied. Students not only recalled more studied than nonstudied words, but depressed students produced more associations to negative words, while nondepressed students remembered more positive words. Mood-congruent memory has been found to work not only with depressed individuals but also with natural mood states that people experience in their everyday lives.¹⁹

Affect, Attention, and Judgments

Evidence from several psychological experiments suggests that affect may play an important role in what subjects attend to. Emotion and mood can serve an orienting function by channeling attention toward or away from various environmental stimuli. People attend to stimuli selectively, and objects that are emotionally significant are given priority in the competition for attention.

This suggests that affect determines whether a given object is emotionally important. In one psychological experiment, participants rated happy, sad, or neutral pictures presented to them by an experimenter who was in either a neutral, happy, or sad mood.²⁰ When participants were shown the pictures, those who were exposed to the happy experimenter spent more time looking at the happy pictures. Those exposed to the sad experimenter focused more on the sad pictures. When asked to rate the pictures, participants exposed to the happy experimenter gave more positive ratings. Participants exposed to the sad experimenter gave more negative evaluations. Exposure to the neutral experimenter had no effect on how much time the participants spent looking at neutral pictures or how they rated them. Affect influenced attention and also played a role in the memory of the participants. Participants recalled more pictures that matched their mood, and those participants exposed to the sad experimenter also suffered from impaired memory. This is how sadness typically affects the

ability of a person to remember. The results of the experiment indicate that affect is an important factor in attention, decision making, and memory.

The experiment has several implications for collection development. It suggests that selectors will be more likely to notice and attend to particular titles or products that match their emotional state. The selector for literature who happens to be in an upbeat mood may find Tom Stoppard's comedies more interesting purchases for the collection than those of Eugene O'Neill. The selector might rate them more highly or as more necessary to the collection or a better value. Particular titles by Stoppard may be more easily recalled than those of O'Neill. Another example might be the selector for psychology who may be in a melancholy frame of mind. For this selector, titles having to do with depression may seem a more compelling purchase choice than those dealing with other topics. These examples suggest how affect might play a role in the crucial cognitive processes such as selection and evaluation, which are part of collection development.

Affect may play a role in how people respond to products, and how they respond to the way in which those products are marketed. Different types of moods may help to determine how individuals react to the way in which titles are advertised. In an experiment designed to test the effect of mood on receptivity to advertising, 120 university students were given either a happy or sad story to read, designed to induce either a positive or negative mood.²¹ In order to help them become aware of their mood, they were then asked to record the feelings that the story produced in them as they read it. The subjects were then given either an emotional or an informational ad for cookies. The emotional ad showed a group of people at a party enjoying cookies in the background, with a colored plate of the cookies in the foreground. The informational ad featured a color photo of the cookies with ten lines of advertising copy describing the brand. Subjects were asked to read the ad they were given and then complete the questionnaire designed to measure how the subjects felt about the ad. The results of the experiment indicated that subjects who were induced into a positive mood reacted more favorably to the emotional ad. Subjects who had been placed in a negative mood were more favorable to the informational ad. The experimenters explained the results by suggesting that the more serious fact-based ad may have been perceived by happy subjects as excessively somber and dry. In contrast, subjects in a negative mood may have resented the emotional ad because it depicted a group of people having a good time and enjoying themselves.

This suggests that selectors may react favorably or unfavorably to how a title is advertised, depending on their mood. Advertising for books, journals, databases, and electronic products has become increasingly sophisticated. It

has evolved from a largely rational informational mode into more emotional and image-based appeals. Whether this trend proves to be effective may depend on how selectors are feeling at the time of selection. For those vendors that use a combination of both emotional and informational appeals, it may depend on how the mix affects a given selector. Product content alone may thus not be the only factor influencing a selector's decision. How a title is presented may also play a role.

Mood may also influence decision making in another way. In one study, when research participants were asked to make a judgment about whether to purchase a car, they readily did so.²² But when the information presented about the car was difficult to understand or was sketchy, respondents tended to rely on contextual cues in order to arrive at a decision. The contextual cue that they relied on most was their mood. Mood may become a particularly important factor with complex products such as electronic resources or for products in which adequate information is unavailable, such as new titles.

Emotion can affect attentional orientation, the elements of the environment to which a selector attends.²³ Negative stimuli have been found to attract more attention than positive stimuli. Psychologists believe that this may be the result of evolutionary development, which made it necessary to remain attentive to threats to an individual's well-being in order to adapt and survive. Not only will individuals orient more quickly to threats, they appear to be particularly sensitive to threats specifically related to their emotional states. In experiments using a Stroop task, subjects were asked to name the color a word is printed in and ignore its semantic meaning.²⁴ Subjects who are afraid of snakes were distracted by words related to snakes such as "venom" or "rattler," while subjects who are socially anxious fixated on words like "outcast" or "ostracize." Thus a selector who is anxious about crime or health or finances may be more attracted to titles having to do with these subjects, may notice them more easily among a group of titles, and may be more predisposed to value them or assign them significance than someone without such an emotional investment.

Psychologists use the "attentional blink" phenomenon to study aspects of the way emotion influences attention.²⁵ Attentional blink occurs when a series of visual stimuli are presented in rapid succession, a procedure known as Rapid Serial Visual Presentation (RSVP).²⁶ The subject is asked to detect two targets. If the targets are presented in very rapid succession, the subject is no longer able to recognize the second target, provided that it is affectively neutral. If the second target is emotionally arousing (in either a pleasant or unpleasant way), however, detection improves.²⁷ This indicates that emotion influences attention, and suggests that in situations in which a selector discovers a title that is emotionally relevant and another title of possible value

appears immediately afterward, the selector may be less likely to detect the second title if it does not have the emotional impact or salience of the first title. With much book selection being conducted online these days, a selector using the Barnes and Noble or Amazon database who is searching through a succession of titles on a particular subject and encounters a title of emotional significance may be more prone to overlook another useful but more affectively neutral title if it appears soon after the emotionally important one. That is because the selector's attention has been monopolized or captured by the earlier title. Arousing titles distract attention from titles of potentially equal merit that may be less arousing. They provide a greater resistance to attentional interferences or capture from competing titles, and this resistance manifests itself in the form of temporal persistence. Thus when an affect-laden title is the second target, it enhances awareness and detection, but when it appears as the first target, it may result in a kind of inattention blindness on the part of selector for the second title.

Mood-Congruent Decision Making

When selectors are faced with a decision about whether to choose a title for the collection, an important factor in the decision-making process is cognitive capacity. This refers to the amount of cognitive resources that are available to make the decision. If information about the title is inadequate, ambiguous, or outdated, or if too much information or conflicting or contradictory information is available, more cognitive resources will be needed. If competing tasks or time pressure are involved, this will increase the need for cognitive resources.

In circumstances where cognitive resources such as attention, learning, memory, and reasoning are insufficient, research by Schwartz suggests the selector may turn to mood-congruent emotions and associations.²⁸ The material is primed to be more accessible to the selector if it matches his or her mood. If the selector is in a negative mood, he or she may more easily recall a negative review of the title than a positive one. If the selector is in a positive mood, a memory of similar titles receiving frequent use may come to mind. A selector will be more likely to evaluate a title positively or negatively and render a favorable or unfavorable decision to the extent that he or she is in a positive or negative mood.

Emotions are involved in decision making in two different ways. Immediate emotions are feelings that are experienced at the time a decision needs to be made. They can affect a selector's decision by having a direct impact (i.e., the way a selector immediately feels about the particular title being considered) or an indirect impact (i.e., the selector happens to have been in a preexisting positive mood

that day, which is enough to sway him or her to purchase the title despite any immediate reservations he or she may have had). The other way that emotions influence decision making is through expected emotions. This kind of emotion refers to predictions that selectors make about the affective outcome of different action scenarios. The predictions are used in selecting actions designed to enhance positive emotions and minimize negative feelings.²⁹ For example, a selector might be considering the purchase of an expensive database, but might also anticipate how disappointed he or she would then feel if the use statistics turn out to be low. In order to avoid experiencing the expected disappointment, the selector might then feel dissuaded from purchasing the database.

Feelings become increasingly important in decisions to the extent that the product is unfamiliar or that information about it is unavailable or ambiguous. In such instances, selectors may turn to emotions to fill in the gap. People faced with difficult or ambiguous decisions may use their emotions as a form of information. They may use their immediate emotions and ask themselves, "How do I feel about it?" and then utilize those feelings in making a decision.³⁰ Immediate emotions that are positive are likely to result in a positive evaluation of the product and a decision to purchase it, while negative emotions will favor a negative assessment and a decision to forego purchase.

Emotions resulting from one situation can affect decisions in completely unrelated situations. This is a phenomenon that psychologists term "emotional carryover."³¹ For example, suppose a selector receives news that the university has decided to curtail certain health-care benefits. He or she is angered by the news and, later that day, is faced with a decision about whether to acquire a new electronic encyclopedia. The selector is ambivalent because, although the encyclopedia is a good one, it is also very expensive. The residual anger from the morning's news about the benefits cut contributes to a negative disposition on the part of the selector. As a result, the selector decides not to acquire the encyclopedia.

Different kinds of emotions have different effects on the level of cognitive processing that occurs in decision making. Emotions that are typified by a sense of certainty, such as anger or contentment, result in more reliance on cognitive shortcuts known as heuristics. Emotions that are characterized by a lack of certitude such as anxiety or surprise result in more careful information seeking and analysis.³²

Mood, Bias, and Stereotyping

Mood has been shown to have an effect on persuasion and stereotyping. Positive mood will not only predispose an individual to accept persuasive messages, but will also

make the person more likely to make use of bias and stereotypes in decisions. In one experiment, happy, neutral, and sad participants were recruited and provided with detailed information about a new model of car.³³ One version of the information described the car as being a highly prestigious brand while the other depicted it as a less prestigious brand. The results strongly support a connection between mood and stereotyping. Happy subjects were greatly influenced by the prestige of the brand. Sad participants were not affected by the prestige of the brand and tended to focus more on details about the car than its perceived image. The implication is that selectors in an upbeat mood will be more likely to be favorably predisposed toward titles from prestigious publishers and vendors when attempting to decide what to purchase.

Negative mood may also prejudice how a person evaluates a product. Evidence of this effect can be found in a study in which students underwent an introduction designed to make them experience either feelings of contentment or anger.³⁴ Once these feelings had been evoked in the students, they were asked to read a restaurant review that they were told came from a newspaper but which had, in fact, been created for the experiment. The review featured an equal number of negative and positive statements about the restaurant. After the moods of the students had been neutralized, they were asked to evaluate the restaurant. Those students who originally read the review in an angry mood rated the restaurant far more negatively than those who read the review in a contented mood. Students who were in an angry mood were also much more likely to recall the negative information about the restaurant, while those in a positive mood were able to remember positive information more readily. In this experiment, mood appeared to have an impact not only on the evaluation process, but also on the memory process. Since reviews of new books or electronic products often play an important role in the selection process, mood may play a role in how selectors interpret reviews and also in how they selectively recall information contained in them.

Mood can also have an effect on the intensity with which a stereotype is held. In one experiment, various means, such as music, were used to induce sad, happy, or neutral moods in a group of Canadian students.³⁵ The students were then asked to describe typical personality traits of six ethnic groups who reside in Canada: English Canadian, Native American, Jewish, Pakistani, Chinese, and Arabic. Each subject was asked to list whether he or she thought each trait was socially desirable or undesirable and the percentage of the ethnic group that the subject thought had exhibited that trait. A stereotype score was then calculated for each group based on the traits attributed to the group and the subjects' estimate of the percentage of the group exhibiting that trait. The results indicated that those

students who were in the sad mood induction group exhibited increased negativity of stereotypes for those groups with negative connotations. Sad subjects rated the negative attributes of these groups as being more undesirable than did happy or neutral students. Ethnic groups that had neutral connotations for the students were not greatly affected by the differences in mood. Interestingly, students in a positive mood and those in a negative mood both rated their own ethnic group highly. The experimenters attributed the result to sad subjects attempting to make themselves feel better by denigrating other ethnic groups while at the same time enhancing the social status of their own group. This suggests that selectors who hold stereotypical views of certain subject areas, authors, or formats may find these magnified when in a negative mood.

Mood may play a greater role in the decision-making process of persons for unusual, atypical, or complex stimuli. Psychologists suspect that since the decision-making process for such targets involves longer and more substantial cognition, there is a greater likelihood that “affect infusion” (the influence of emotions upon cognition) may occur. In contrast, any target or object that is prototypical or otherwise standard can be easily comprehended and understood and thus would require relatively little cognitive processing.

In one experiment, the experimenter used a mood induction process to examine the effect of mood upon memory and recall for atypical objects, in this case unusual fictional characters in a story.³⁶ Mood turned out to be a significant factor in the amount of information subjects remembered about atypical targets, but not typical ones. Subjects who were in a sad mood had better recall for atypical targets, while subjects in a happy mood were better able to remember typical targets. The experimenter believed that because subjects in a sad mood engage in a more in-depth, careful kind of processing, they were better able to recall more unusual complex objects. Conversely, happy subjects, more prone to engage in superficial processing that utilizes heuristic shortcuts, thus found it easier to remember standardized objects.

In a follow-up experiment, subjects were exposed to photographs of couples.³⁷ In some photos, the couples were matched in terms of physical attractiveness, while in other photos, the couples were mismatched. The prediction was that the mismatched couples would generate more cognitive processing and also more mood-influenced judgments. The experimenter found that this was true, particularly in the case of mixed race couples, but that it did not prove true for more conventional targets such as same-race couples. The more visible the mismatch between partners, the more cognitive activity occurred and the greater were the effects of mood on thinking. Subjects took longer to process information about unusual couples, remembered information about them better, and made evaluative decisions about them

that were significantly more influenced by mood. Based on this evidence, it seems likely that a selector will spend substantially more time and effort in deciding whether or not to select an atypical title. It also seems probable that the decision will depend to a greater degree on the mood of the selector than if the title under consideration were more expected.

Mood Incongruence, Contrast Effect, and Overcorrection

Although the preceding studies have suggested that individuals’ feelings will tend to influence their judgment toward closer alignment with their existing mood, this is not always the case. In occasional instances, what psychologists refer to as a “contrast effect” may occur.³⁸ The results of some experiments indicate that subjects induced to feel sad assessed the target more favorably than subjects who were made to feel in a happy mood. Researchers attribute this mood incongruence to a psychological mechanism, contrast effect, which does not invalidate the multitude of previous studies that have found judgment and decision making to be mood-congruent. Rather, it suggests that an additional process may be involved in cases of affective asymmetry, in which negative emotions result in more positive evaluations than positive feelings.

The process that psychologists believe is involved in instances of contrast effect occurs when individuals become conscious that their emotions may influence the evaluation of an object. In an effort to counter this bias, they overcompensate and end up evaluating the object to an opposite extreme of their original feeling. The overcorrection occurs because people tend to overestimate the degree to which their feelings influence their judgment. As a result, they not only exclude their own feelings about the object but also ideas activated by the object to be evaluated.³⁹ People’s ideas are based on a layperson’s estimate of how feelings influence decisions and are thus not necessarily accurate and may be subject to distortion.

Overcorrection was tested in an experiment in which a group of subjects were induced to feel discomfort by holding both their arms out straight for six minutes.⁴⁰ Another group of subjects were asked to rest both their arms comfortably on a table for the same period of time. While this was occurring, the subjects listened to a tape recording of a person reading an autobiographical statement written as part of a job application for a position at the university. When the statement was finished, half of the subjects were asked to rate their feelings and the other half were asked to participate in a word-association task that served as a distraction. Then all the subjects were given a questionnaire that asked them to rate the personal appeal of the job appli-

cant, and then rate the level of discomfort they experienced in their arms. The results of the experiment indicated that the subjects who were distracted by the word-association task exhibited predictable affective congruence. The more discomfort they experienced, the lower they rated the job applicant. When the subjects were made aware of their feelings, however, they exhibited the contrast effect. The worse they felt, the better they rated the applicant. The subjects who were aware of their discomfort realized that it would bias their judgment and overcorrected for it in their assessments of the applicant.

Some psychologists believe that negative affect is more likely to produce overcorrection than positive affect.⁴¹ This is because negative affect tends to be associated with higher degrees of cognitive activity. The heightened degree of cognitive activity is said to stem from negative affect signaling the person that something is wrong in the environment and that strategies must be devised to address the problem. Negative emotions also tend to lead to inner-directed introspection, which in turn may lead to heightened sensitivity to negative affect and a corresponding cognitive effort to trigger the contrast effect and corresponding decisional overcorrection.

The psychological research described above suggests that selectors who may be aware that they have a bias either in favor of or against a particular subject area, topic, or author may be vulnerable to the contrast effect. Knowing they have such a prejudice may lead them to attempt to overcompensate for their preferences. Because non-psychologists are not fully aware of the extent to which their feelings influence their judgment, when they try to achieve more of a balance in their selection decisions they may overcorrect and, ironically, end up shifting the selection balance to the other extreme. For example, the selector who knows he has a strong interest in the theoretical aspects of sociology may be acutely sensitive to this preference. In an effort to compensate for this predilection, the selector may try to place extra emphasis on ordering as many quantitative titles as possible. In years in which the publication of quantitative titles is particularly strong, the selector may actually end up purchasing more quantitative than qualitative titles.

If a selector has an aversion to a particular author, school, or genre, and is faced with a decision regarding whether or not to purchase a work that falls within that vein, the selector may make a conscious attempt to deliberately purchase the title. Because the selector knows he or she is biased against it, that bias may itself constitute the deciding factor in persuading the selector to acquire it. Since many selectors also serve as liaisons to faculty in various departments, the bias may take place at a human level rather than a bibliographic one. Selectors, being human, may have certain feelings, either positive or negative, about faculty within the departments they work with. Since many purchases are

made with particular faculty members in mind, if the selector has a marked preference for or an aversion to particular faculty and is conscious of these biases, he or she may try to compensate by purchasing more titles that lie within areas of research of less-favored faculty and, as a result, end up overcorrecting.

Conclusion

Collection management in general—and decision making for collection development in particular—has been characterized as a highly logical, rational process that is primarily based on cognitive factors like attention, perception, memory, and reasoning. The collection management literature is devoid of discussion of any affective processes that may play a role in collection development decisions. Yet, as this paper has tried to suggest, evidence in the psychological literature suggests that affect does play an important role in judgment and decision processes. The experimental evidence indicates that decision making is not exclusively a cognitive process. Emotions do play a significant role, and this paper suggests that affect may interact with cognition in judgment and decision-making processes related to collection management.

In order to make optimal collection-management decisions, selectors, of course, need to do the proper cognitive work, carefully researching the titles they are considering for purchase and investigating the needs and interests of their potential audience, the faculty, and students. Competing demands on cognitive processes, whether stemming from budgets, deadlines, or other library projects, may be inevitable, so it helps to realize how these may affect decision making. Selectors also need to be aware of their emotions and mood states and keep in mind how these may influence cognitive considerations. Certain emotions, such as positive mood states, may make selectors less critical and evaluative in the decision-making process. Whenever selectors find themselves in this state, they need to be particularly vigilant. Affect may also influence memory, and since memory plays an important role in decisions, selectors need to be wary of selective memory. Emotions and mood may also be a factor in what selectors pay attention to, as well as the kind of product advertising that appeals to them. Selectors need to be alert to emotionally incongruent material. Affect may also play an important role in the selection process when information about the product is unavailable or ambiguous. Sticking to the facts as much as possible will discourage irrational or impulsive purchases. Some selectors may use their feelings as a form of information in selecting a product, asking themselves how they feel about it, or even how they might feel about it. Awareness of feelings is advisable and desirable, but decisions should also be based on the best

evidence available. Emotions from one situation largely or completely unrelated to selecting a title may nonetheless be carried over into the decision process, and selectors need to learn to compartmentalize their emotions.

Both positive and negative moods and emotions can predispose selectors to various forms of bias in the evaluation and selection process. Unusual or atypical titles may be particularly susceptible to mood influence in the selection process, and selectors need to take this into account when they encounter these titles. Finally, selectors need to be aware of the contrast effect and the problem of overcorrection for selection bias. Understanding this psychological mechanism might make selectors less prone to second-guessing themselves in selection decisions and more circumspect about efforts to correct for biases in their selecting.

This paper suggests important implications for how selectors approach the process of collection development, and for how selectors are trained to do their work. Selectors need to look at collection development as more than simply a logical, left-brained, rational calculus of searching for new titles, weighing their strengths and weaknesses, speculating on their potential use, and then trying to make a selection decision based on all the personal variables that come into play. They instead might try a more phenomenological approach, in which they make an effort to become acutely aware of their emotions and moods, take these into account, and then use them as data that might prove as valuable as understanding the product attributes and the potential audience for it. The psychological evidence regarding the various ways that affect can influence cognition in decision making argues for a more self-aware, introspective approach to selection—one in which a selector's mood states and emotions are potentially of great importance and should be afforded greater weight in the overall process of selection.

Further research is needed on the role that emotion may play in the selection process. Experiments could be designed to determine how much of a factor affect may constitute during the actual process of deciding what gets added to the collection. Many of the psychological experiments discussed in this paper use students as subjects. In demographic terms, students tend to be younger and less educated than librarians, therefore working with a population of librarians to see if similar results obtain would be highly useful. It would also be helpful for the experimental conditions to simulate the actual working conditions of selectors rather than those of the lab.

Understanding that affective processes may be involved in decision making for collection development is not enough. More research needs to be done on the relationship between cognitive and affective processes and how they interact and influence each other. In the years to come, psychologists likely will further explore and refine the nuances of the

relationship between thinking and feeling as they affect decision making and choice. Librarians would do well to keep abreast of their research and adapt it to conduct research of their own.

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Toward Releasing the Metadata Bottleneck

A Baseline Evaluation of Contributor-supplied Metadata

By Amanda J. Wilson

Metadata creation is one of the most expensive components of digital projects. Organizational expertise (the correct structure, syntax, and use of metadata elements) and subject expertise (the appropriate semantic description of a resource's content for users) are both needed to create a high-quality metadata record. Resource creators are frequently considered good metadata generators. Contributors or subject enthusiasts in a discipline are another population that may be good candidates for metadata creation. In this study, the quality of contributor-supplied metadata is evaluated. Metadata records submitted through a Web form are compared to the final published version of the record. Structural and semantic errors are noted throughout the records evaluated. Overall, semantic quality was good, reflecting subject expertise. The appearance and type of structural errors suggests that improvements in the interface can reduce contributors' need to have organizational expertise to create high-quality metadata records.

In the life cycle of digital projects such as repositories, databases, registries, and collections, one of the most expensive initial components is metadata creation for each digital resource.¹ Metadata creation requires both organizational and subject expertise to describe an object and its context for use. In this paper, organization expertise refers to the ability to apply the correct structure, syntax, and use of metadata elements, while subject expertise refers to the ability to generate appropriate semantic (or meaningful) description of a resource's content for users. High-quality metadata utilizing both expertise types is an integral part of effective searching, retrieval, use, and preservation of digital resources. Metadata professionals tend to be proficient both in organizational and subject expertise; however, they are too few to provide sufficient metadata in a timely, efficient manner for the abundance of digital resources, creating a bottleneck in a digital-project's workflow.

Rather than sacrifice the quality of metadata in digital projects, recent research to alleviate the bottleneck has explored several methods to reduce the need for either organizational or subject expertise in metadata creation, including use of creators as metadata suppliers and automatic metadata-generation processes.² Currently, creators seldom provide sufficient metadata for their digital resources, and scalable automatic metadata-generation techniques that produce acceptable metadata are still in development.³ This paper explores another group outside of metadata professionals and resource creators for human metadata generation: subject enthusiasts, or those with a significant background in any discipline.⁴

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One primary benefit of enlisting contributors to provide metadata in digital projects is that the pool of potential metadata creators immediately increases. The potential for collaborative metadata generation, or “the joint production of Web resource metadata,” also increases.⁵ While resource authors are the primary focus of current research in human metadata generation, the purpose of this paper is to serve as a baseline study of the contributor-supplied metadata using RILM Abstracts of Music Literature (RILM), an international database of scholarly works about music.⁶ RILM uses authors and subject enthusiasts (volunteers from the international music community) to create basic metadata records that are then reviewed and enhanced by metadata professionals before the final resources are published in the database. Secondly, this paper evaluates the quality of contributor-supplied metadata when specific content guidelines for elements are available.

Literature Review

Metadata-quality evaluation is closely related to the extensive research conducted on all aspects of data quality. One of Orr’s six laws of data quality states that “[the] laws of data quality apply equally to data and metadata.”⁷ Though the entire corpus of data-quality research will not be discussed here, some studies will be highlighted as they relate to this project. Data-quality research explores two basic tenets of data. Rothenberg identified them as correctness and appropriateness of data.⁸ In metadata creation, correctness and appropriateness are comparable to organizational expertise and subject expertise, respectively. Rothenberg then elaborated on the “process of evaluating and assessing data . . . referred to as ‘Verification, Validation, and Certification’” (VVC) as a method to assess data correctness.⁹ In this process, data are reviewed for adherence to applicable specifications or requirements, assurance that values reflect what is represented, and authoritative endorsement at some level. Focusing on improving the appropriateness of data systems, Orr stated that to improve a system’s quality (i.e., a digital-project database), only data that is relevant and used should be collected.¹⁰ If data are not relevant, resources are wasted on its creation and maintenance. If data are not used, then they eventually become obsolete and therefore not appropriate for their original purpose.

Using financial information systems, Cappiello, Francalanci, and Pernici developed a framework to assess the appropriateness of data based on users’ varying purposes and needs.¹¹ Their research was conducted in an effort to better define the relevance and usefulness of data, specifically taking into account “the degree to which data satisfy users’ needs.”¹² Research in metadata quality for digital projects and collections has examined both correctness and

appropriateness of metadata using similar indicators such as timeliness and usefulness.

Recent studies of metadata quality have resulted from increased sophistication in the creation, use, and implementation of metadata. Quality assurance of metadata is essential not only for successful digital projects, but for the successful operation of metadata aggregators.¹³ The following section examines the literature covering three aspects of metadata quality: its definition, indicators or evaluation metrics, and types of errors commonly found in metadata records.

Metadata Quality

What is high-quality metadata? A standard definition of metadata quality is still developing. Metadata researchers do agree, however, that metadata quality involves its fitness for a specific purpose or use.¹⁴ In their article on improving metadata quality, Hillmann, Dushay, and Phipps of the National Science Digital Library, an aggregated database of science information, asserted that “the utility of metadata can best be evaluated in the context of services provided to end-users,” focusing on appropriateness.¹⁵ The authors proposed evaluation of metadata appropriateness at the element level, rather than record level, to best tailor information for users.

Further, Bruce and Hillman defined a framework in the form of a continuum of metadata quality for automated evaluation of metadata at an aggregator level.¹⁶ Their framework was developed in the context of large-scale aggregated collections, which require both domain-independent indicators, such as timeliness and provenance, and three-tiered quality levels for automated quality-assurance processes. Metadata quality indicators enumerated include completeness, accuracy, provenance, conformance to expectations, logical consistency coherence, timeliness, and accessibility. These indicators address both the correctness and appropriateness of metadata. The first-tier quality level gauges the entirety of a record, a portion of organizational expertise. This tier focuses on the presence or completeness of a record. The second tier includes additional indicators, such as use of controlled vocabularies and community-defined elements, which require organizational expertise and some subject expertise. This tier begins to address appropriateness and encompasses Hillman et al.’s recommendation to evaluate quality in each element.¹⁷ Finally, the third tier adds quality indicators such as application profiles requiring a full complement of organizational and subject-expertise skill sets.

Shreeves et al. evaluated the quality of harvested metadata at an aggregator level in order to determine how metadata quality at a local level affects searching federated collections.¹⁸ The framework used in their study contained both intrinsic information quality (or correctness) indicators and relational information quality (or appropriateness)

indicators that mapped to each indicator in Bruce and Hillman's framework.¹⁹ These indicators were used to evaluate records based on completeness, consistency, and ambiguity. They found that the quality of metadata varied between and among collections of metadata records.

With an aim to create a networked government information system, Moen, Stewart, and McClure completed a thorough analysis of metadata-quality literature and identified twenty-three distinct indicators to evaluate the implementation of a specific element set, the Government Information Locator Service (GILS).²⁰ The study focused primarily on compliance (or correctness) of metadata records created at forty-two federal agencies using GILS. The authors used the twenty-three indicators to rate compliance quality in four categories covering correctness and appropriateness: accuracy, completeness, profile, and serviceability. In both Moen, Stewart, and McClure's and Shreeves et al.'s aggregator examples, metadata records could have been created by authors, contributors, or library and information science professionals.²¹

Greenberg et al. evaluated metadata quality at the point of metadata creation.²² Specifically, they examined the quality of eleven author-supplied metadata records using the National Institute of Environmental Health Sciences Dublin Core schema to determine baseline metadata quality. Their research argued that authors can create acceptable metadata records, as ranked by professional catalogers, using a Web template and text guidelines. Experienced professional catalogers determined the "high quality" standard for the author-generated records. They determined the acceptability of the author-supplied metadata and rated each of the records on the basis of intelligibility and correctness of the metadata.

Correctness and appropriateness are recurring themes in the metadata quality literature discussed. Specific aspects of both overarching themes appearing multiple times are completeness, accuracy, and intelligibility. These aspects apply to both the record level and element level quality. Thus metadata quality is determined by the compilation of elements used to fully describe a resource, the scheme, and the values within each element. In all but Greenberg et al., who explicitly evaluated resource creators, metadata records could have been created by authors, contributors, information professionals, or some other entity.²³ The possible effects of heterogeneity of metadata creators was not specifically identified as the cause of lower quality. Strict adherence to and availability of institutional metadata guidelines is a common recommendation to improve metadata quality.

The types of errors found in metadata quality studies are similar at both the aggregation and local levels. Within the e-print community, Barton, Currier, and Hey identified some common problems in metadata records and how they affect use and retrieval of digital resources.²⁴ The problem

areas and elements include spelling and abbreviations, author and other contributors (e.g., editors and translators), title, subject, and date. These problems may also affect utility of metadata at an aggregated level; however, aggregators have another set of quality concerns. Dushay and Hillman also identified categories of errors found in metadata records at an aggregator level: missing data (e.g., empty elements), incorrect data (e.g., author data in language fields), confusing data (e.g., strings of names, or data culled from another source—a bibliography, for example—and not revised once in metadata record), and insufficient data.²⁵

Some of these errors are obviously human errors; others, such as incorrect data, could be attributed to the usage and implementation of local metadata-element sets. For example, Hanrath noted in his usability study of a Dublin Core template that metadata creators with subject expertise desired additional specific elements to accurately describe the resources.²⁶ Though he was not examining the quality of records created, the absence of a logical element for a piece of information deemed relevant resulted in metadata creators supplying incorrect data in another field, thus affecting Hanrath's usability study. At both the aggregator and local level, the frequently suggested solution for many errors in metadata records is publicly available documentation developed and used at the local level that outlines use and content of metadata elements in a digital project.²⁷

Research Objectives

This paper aims to evaluate the use of contributors as viable high-quality metadata creators for the RILM database. To evaluate the current baseline quality of metadata records contributed to the database, the following objectives were sought:

- gauge the completeness of each record;
- determine the types of errors (typographical/grammatical or semantic), if any, in each record; and
- identify the appearance and type of "value-added" or additional metadata in each record.

These three objectives address both the organizational and subject expertise needed for high-quality metadata by looking at quality both at the record level and within each element.

Research Methods

Rothenberg's Verification, Validation, and Certification (VVC) model for evaluating data quality guides the methodological design to evaluate each of the objectives for this study.²⁸ RILM's submission process produces a final

metadata record that satisfies all three criteria and ensures high-quality metadata. Currently, one way contributors can supply metadata is via online submission forms. The contributor metadata forms the basis for a short record in RILM's database. Only metadata submitted via the submission form was evaluated in this study. Based on an examination of the actual articles, trained RILM personnel, including staff, librarians, and musicologists, subsequently edit and enhance the metadata; these are the verification and validation steps.²⁹ RILM requires more fields for each record than appear on the submission form. These fields, including subject headings, do not appear on the submission form and are supplied by RILM personnel. The final, enhanced version of the metadata record is then published in the RILM database, replacing the initial short record; this is the certification step.

Records Evaluated

RILM provides records for various types of scholarly works related to music. Initially, the author asked RILM for a selection of raw metadata records submitted to RILM from 1998, 2000, and 2004. The submission data supplied contained records for a majority of the record types represented in RILM, including articles in proceedings, monographs, and sound recordings. Previous metadata quality studies have evaluated between 11 and 140 records.³⁰ In order to have enough records to enable identification of patterns in the data, the target number of records for this project is 100. The author counted the occurrence of each record type (i.e., monographs, articles appearing in periodicals) to identify one type of record for evaluation. Submissions for the articles in a periodical record type appeared most frequently; therefore, record submissions for articles appearing in a periodical were evaluated in this study. RILM is an international database containing records in many languages. Because English is the only language with which the author is familiar enough to accurately assess semantic and structural errors in metadata records, the focus of the semantic abstract evaluation in this study is English-language submissions.

Procedure

The raw submission data (the contributor-supplied metadata record) is the unit of evaluation in this study. High-quality metadata is appropriately fit for a purpose. A raw contributor-supplied metadata record's purpose for RILM is to form a temporary record in the database and the basis for a final RILM record. Thus, the high-quality metadata standard in this paper is the final RILM-enhanced record from each contributor-supplied record that appears in the RILM database as displayed via OCLC's FirstSearch interface.

Evaluating contributor-supplied metadata involved a three-step process. First, the final RILM record corresponding to each contributor-supplied record was located in the RILM database. If two records were found for the same raw submission record because the short record still remained in the database, the RILM record containing subject headings was selected for evaluation. Second, the RILM records were printed to facilitate comparative evaluation. Finally, the raw submission and final RILM-record metadata were compared element by element based on a key. Table 1 shows the metric used to evaluate each record through identification of different types of errors and value-added elements in each contributor record. For the purposes of this paper, an error occurred each time RILM made a change or addition to an element. Part A of the table contains the codes and usage notes used to mark each instance of an error type for all elements except for the "Abstract" field. Each error type in table 1 is mapped to a quality factor. Part B contains the codes and usage notes used to evaluate quality in the "Abstract" field. Analysis of the raw submission is compared to the final record based on three factors: syntax, structure, and semantic content.

In this paper, syntax refers to the overall completeness of the metadata record submitted. Each published RILM record consists of complete bibliographic information, an abstract, subject headings, and other relevant information (e.g., reference to related record in the database) if applicable. Most of these elements have corresponding fields in the submission form. Completeness is the inclusion of every required element for each type of record added to the database as defined in the RILM submitter guidelines. The appendix lists the fields required for articles appearing in a periodical. This factor is an indicator of organizational expertise.

Structure deals with the format of each element (format issues within a field). For example, values in the ISSN field should be four numbers followed by a hyphen followed by four numbers. In the submission form, text input boxes, dropdown menus, or radio buttons are provided for every field. Fields with text input boxes include "Author name," "Periodical title," "ISSN," and "Page numbers." These fields are structurally distinct from each other due to the different types of metadata that belong in each. Because the metadata may appear in different forms on the original source, variance in metadata submission may occur. Four types of structural errors were noted: non-authoritative forms, capitalization, punctuation, and other spelling and typographical errors. Structure is another indicator of organizational expertise.

Semantic content refers to the provision of content in each field. In other words, if content is supplied in a field, is that content correct, and is the content in the appropriate field? Five types of semantic errors were noted: RILM editing a portion of an element (e.g., changing "music of

Table 1. Metric used to evaluate raw submission records

Part A: Record analysis		
Code	Quality factor	Notes
E	Enhanced (provided by RILM)	added to a field that is not required
Ed	Edited (edited by RILM)	portion of field is wrong
I	Incorrect data	(100% wrong data)
R	Required data missing	
U	Usage—misplaced data	can be a portion of a field
AC	Authoritative name/form needed	
G	Spelling/typographical error	
GC	Capitalization	
GP	Punctuation	
A	Added value (content)	regardless of whether used in final record
XU	Correct, unused	correct information for a field, but not used; (counts as Added value)
X	Provided correct information	
Part B: Abstract content analysis		
Code	Quality factor	Score (0 or 1)
NM	First and last names	not edited (0) versus edited (1)
TI	Complete titles	not edited (0) versus edited (1)
TI(NUM)	Complete titles with index or opus numbers	not edited (0) versus edited (1)
EN	Complete entity names	not edited (0) versus edited (1)
DEF	Definition of terms not in Grove or MGG*	not edited (0) versus edited (1)
GEOG	Complete and correct place names	not edited (0) versus edited (1)
BIB	Basic bibliographic information for articles or books referred to in abstract	not edited (0) versus edited (1)
STY	Style of abstract is declarative versus descriptive	declarative (0) versus descriptive (1)

**Grove Dictionary of Music and Musicians* and *Die Musik in Geschichte und Gegenwart* (MGG) are major music encyclopedias.

the church” to “church music”), RILM adding values for a non-required element (e.g., supplying ISSN), contributors leaving out required element values (e.g., contributors not supplying an author), contributors supplying an incorrect value (e.g., wrong or incomplete ISSN, wrong date), and correct data supplied in an inappropriate field (e.g., contributors putting volume and issue information in the “Volume” field). In other words, is the correct information in the appropriate field or misplaced in a different field? For exam-

ple, each “Author name” field is paired with an “Author function” drop-down menu, which contains values such as preface author, editor, and translator in addition to author. Though RILM considers persons serving as translators to be “authors,” contributors may not have grasped RILM’s broad concept of authorship. On the submission form, separate fields are for information that may be concatenated on the original source (e.g., volume and issue number). Other information may simply be incorrect; that is, data for a particular element in the submission record (“Year” value is 1994) is completely different from that appearing in the final published record (“Year” value is 1999).

The primary field for elaborated content is the abstract field. RILM has outlined specific guidelines for writing abstracts.³¹ Essential content includes key concepts and names. Table 1, Part B: Abstract content analysis, is derived from the RILM abstracting guidelines document. Eight abstract elements are defined. In general, RILM requires complete names (persons or organizations, works, places) and titles. RILM prescribes the writing style, requesting concise, declarative abstracts. Because key concepts, themes, and names are appropriate and relevant to RILM’s target audience, this factor is an indicator of subject expertise.

The appearance and type of “value-added” or additional information in the submission is also noted. A “value-added” element in contributor-supplied metadata could be keywords, notice of related RILM records, or

other details the contributor may deem important, such as a Web address for an online journal. Value-added elements are also those elements for which contributors supplied values, but are not present in the final RILM record. Examples include non-English language abstracts in addition to English-language abstracts, translated titles, or notice of English-language summaries within an article. The presence of value-added information is an additional indicator of subject expertise.

Results

A total of 104 records for articles appearing in a periodical were evaluated for this study. Of those, 55 records were contributed by the person who abstracted the article. The remaining 49 records were submitted by someone other than the person who abstracted or authored the article—that is, a third party.

The contributor metadata contained 384 errors, or 3.69 errors per submission. The frequency distribution of structural and semantic errors is presented in table 2. Each submission contained between 18 and 26 elements, depending on how many authors were identified for an article. Of the total number of elements and taking all author name/function pairs as one element, 4 elements are required for each submission (see appendix for specific required elements). Table 2 shows the frequency distribution of the structural and semantic errors occurring within each element. The frequency rates show that structural errors occurred more often than semantic errors: 183 semantic errors (1.76 errors per record) and 201 structural errors (1.93 per record).

Table 3 gives the numeric frequency of errors by element for elements with the highest and lowest error rates. Elements fell into three distinct categories based on the number of errors per element: high-frequency error rate (at least 30 errors), low-frequency error rate (10-29 errors), and infrequent-error rate (less than 10 errors).

Table 4 shows the frequency of errors by specific error type. “Edited” and “Authoritative name/Form needed” (Authority Control, or AC) errors are the most frequent errors in the sample at 110 and 114 instances, respectively. Edited elements had some portion of the values changed by RILM, and the AC element values were formatted to RILM specifications. Values placed in the wrong field, “Usage—misplaced data,” and values with spelling or typographical errors other than punctuation and capitalization were the least frequent errors among records evaluated. Specific results of the metadata-quality analysis based on syntax, structure, and semantic content follow.

Syntax

Syntax is the measure of completeness of the contributor-supplied metadata record. Table 5 details each element’s use frequency. Of the 104 contribu-

Table 2. Frequency distribution of structural and semantic errors

Elements in order of structural error frequency rate			
	Structural	Semantic	TOTAL
Periodical title*	75	2	77
Title/subtitle*	52	6	58
Serial date	35	2	37
Year of publication*	10	1	11
Volume	8	4	12
First author*	8	1	9
Issue no.	6	9	15
ISSN	6	2	8
English abstract	1	45	46
Translated title	0	53	53
Special features**	0	37	37
Second author*	0	5	5
Second-author function**	0	5	5
Page numbers	0	4	4
Name of abstractor	0	4	4
Third author*	0	1	1
Third-author function**	0	1	1
Language(s) of summaries**	0	1	1
Total:	201	183	384
Elements in order of semantic error frequency rate			
	Structural	Semantic	TOTAL
Translated title	0	53	53
English abstract	1	45	46
Special features**	0	37	37
Issue no.	6	9	15
Title/subtitle*	52	6	58
Second author*	0	5	5
Second-author function**	0	5	5
Volume	8	4	12
Page numbers	0	4	4
Name of abstractor	0	4	4
Periodical title*	75	2	77
ISSN	6	2	8
Serial date	35	2	37
First author*	8	1	9
Third author*	0	1	1
Third-author function**	0	1	1
Year of publication*	10	1	11
Language(s) of summaries**	0	1	1
Total:	201	183	384

*required fields

**value-list/controlled vocabulary in radio-button or drop-down-box input type

Table 3. Elements with high- and low-frequency errors

Elements with high-frequency errors			
	TOTAL	Semantic	Structural
Periodical title*	77	2	75
Title/subtitle*	58	6	52
Translated title	53	53	0
English abstract	46	45	1
Serial date	37	2	35
Special features**	37	37	0
Total:	308	145	163
Elements with low-frequency errors			
	TOTAL	Semantic	Structural
Issue no.	15	9	6
Volume	12	4	8
Year of publication*	11	1	10
Total:	38	14	24

*required fields

**value-list/controlled vocabulary in radio-button or dropdown box input type

Table 4. Specific error frequencies

Frequency of errors (by type)			
Structural	AC	Authoritative name/form needed	114
	GC	Capitalization error	53
	GP	Punctuation error	32
	G	Spelling/typographical error	2
Semantic	Ed	Edited	110
	E	Enhanced	51
	R	Required data missing	10
	I	Incorrect data	7
	U	Usage—misplaced data	5
TOTAL Errors			384
Added-value (by type)			
	A	Additional notes	23
	XU	Supplied, but not used	19
TOTAL Added value			42

tor-supplied records, 100 contained values for all required elements. Required elements include Title/subtitle, Author name(s) and function(s), Periodical title, and Publication year. The 4 incomplete records were missing required additional author entries. These additional author entries were

listed in RILM as translators and interviewees. Not only did a majority of records contain the basic required elements, but, taking all author name/function pairs as one, 16 of the 18 elements (88 percent) were used in more than half of the contributor metadata records evaluated (that is, occurred in 52 or more records).

Structure

The structure of each element is the format of the values supplied. Structural correctness for each record was determined based on the final RILM record. Table 4 shows the 4 types of structural errors noted in the evaluation. These 4 errors primarily assess spelling, punctuation, and other typographical errors, as well as AC formats for fields such as “Author name” and “Periodical title.” Structural errors occurred in 6 elements: “Author name,” “Periodical title,” “ISSN,” “Serial date,” “Issue no.,” and “Year of publication.”

Table 4 gives the number of each type of structural error. AC is the most common error in the contributor metadata with 106 instances occurring throughout the records evaluated. Of the 77 structural errors in the “Periodical title” field, 45 of them were AC. RILM added and removed subtitles and other words to and from the element for corrections. Fifty-three capitalization errors occurred in two fields, Title/subtitle (35) and Periodical title (18). Within Title/subtitle, capitalization errors occurred more frequently in the subtitle (25 of 35 times or 71 percent). Thirty-two punctuation errors were documented. Twenty-seven punctuation errors occurred in both the Title and Periodical title fields.

Semantic Content

Semantic content of each metadata element refers to the correctness of values in a field. Table 4 also lists semantic errors. The most common semantic corrections performed by RILM were editing some portion of an element’s value (Edited) or supplying values for non-required elements (Enhanced). Edited and Enhanced errors account for 88.48 percent of the semantic errors in contributor-supplied metadata. Edited errors occurred in the widest spread of elements—9. “English abstract” field was edited in 43 of 50 supplied values. Some of these errors were semantic, such as contributors supplying translator names in the abstract. Other errors, which will be discussed later, are the result of abstract guideline infringement. The element with the next most-frequent Edited error rate is “Special features,” a controlled-value list. RILM removed terms from nine records, exchanged terms (e.g., “diagrams” to “tables,” “sound recordings” to “sound files,” “charts” to “illustrations”) in 12 records, and added new terms to 18 records. RILM supplied values that contributors left blank for 51 non-required elements across the records evaluated.

Table 5. Contributor metadata supplied in each submission

Arranged by Element		Arranged by Frequency	
Title/subtitle*	104	Title/subtitle*	104
Translated title	68	First author*	104
First author*	104	First-author function**	104
First-author function**	104	Periodical title*	104
Second author*	6	Year of publication*	104
Second-author function**	6	Language(s) of article**	104
Third author*	1	Country of publication**	96
Third-author function**	1	Page numbers	93
Fourth author*	0	Special features**	93
Fourth-author function**	0	Name of abstractor	89
Fifth author*	0	Issue no.	88
Fifth-author function**	0	ISSN	80
Periodical title*	104	Translated title	68
ISSN	80	Serial date	65
Volume	57	Volume	57
Issue no.	88	Non-English abstract	55
Serial date	65	English abstract	50
Year of publication*	104	Language(s) of summaries published within the item**	26
Page numbers	93	Second author*	6
Country of publication**	96	Second-author function**	6
Special features**	93	Third author*	1
Language(s) of article**	104	Third-author function**	1
Language(s) of summaries published within the item**	26	Fourth author*	0
English abstract	50	Fourth-author function**	0
Name of abstractor	89	Fifth author*	0
Non-English abstract	55	Fifth-author function**	0

*required fields

**value-list/controlled vocabulary in radio-button or drop-down-box input type

Three-quarters of these values (39) were supplied in the “Translated title” field.

The remaining 3 error types were recorded 10 or fewer times. The required data missing errors (R) all surfaced in 5 author name/function pairs. RILM supplied name and function values for an interviewee, preface author, and translators. Because of the 5 missing author entries, a total of 10 R errors resulted. Incorrect errors were just that—contributor-supplied values were 100 percent wrong. In most cases the wrong year or ISSN was supplied. In 5 instances, correct values were supplied in incorrect fields (Usage—misplaced data). Four of the 5 misplaced values are related to the author elements. For example, the subject of one article was supplied as an author and translators of others were listed in abstracts. The fifth Usage—misplaced data error was unre-

lated to author elements—the theme for a journal issue was supplied in the “Periodical title” field.

Abstract Element Guidelines

The “English abstract” element is the only field with separate guidelines specifically outlining rules of content supplied. Guidelines for abstract elements only apply if an element is present in the summary. Analysis of “English abstract” focused solely on the explicit guidelines, which operationalize important elements of the field, and not how qualitatively good an abstract is according to RILM. Table 6 shows the number of errors in abstracts by both authors and contributors. Of the 50 supplied abstracts, 33 were contributor-authored, while 17 were author abstracts that

Table 6. Abstract content analysis data (N=50)

	First/last names	Complete titles	Titles with index/opus numbers	Entity names	Definition of terms	Complete/correct place names	Bibliographic information	Style
Contributor abstracts								
Edited records	5	4	1	0	n/a	1	1	1
Total instances	19	14	6	3	n/a	3	3	33
Author abstracts								
Edited records	2	2	1	0	0	1	n/a	4
Total instances	11	4	1	1	1	7	n/a	17
Totals								
Edited records	7	6	2	0	0	2	1	5
Total instances	30	18	7	4	1	10	3	50

contributors provided. Overall, RILM edited 13 records for guideline errors, 39.39 percent of 33 elements, and 10 of 17 (58.82 percent) author-supplied records for a total of 23 errors for the 50 abstracts evaluated.

The most frequent abstract element supplied in the evaluated records was name, a total of 34 instances including personal and corporate names. In 7 of 30 records (23.33 percent), personal names were edited; RILM mostly supplied the fuller form of a name for the final record. All of the 4 records with corporate names remained unedited. Figure 1 shows the percentage of errors occurring in each element. No more than one third of the instances of a supplied element were edited in the records evaluated. Bibliographic

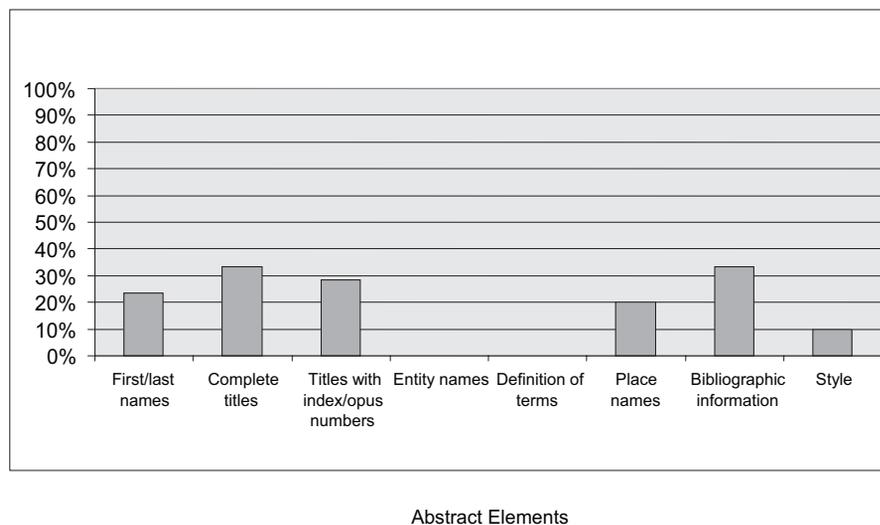
information was edited most often in terms of percentage. Taking both Title elements together, Title was edited second most often at 28 percent of the time.

The last abstract element, "Style," is slightly different from the others, in that it is a subjective evaluation. RILM asks for contributors to supply abstracts in a declarative writing style. RILM edited 5 of 50 abstracts' styles to convert them from descriptive to declarative style. One example of a change in style occurs when a contributor abstract summarizes the article from a third-person point of view, while RILM's version "speaks" the summary or extract from the article. The other 3 stylistic corrections occurred in abstracts written by the paper's author. In each case, RILM trans-

formed an author's descriptive abstract into a concise, declarative summary. For example, the following author excerpt, "Yet I have found an abundance of information about this active salon culture in diaries, letters, and journal articles. Warsaw had over forty significant salons, and direct evidence of Chopin's musical presence can be established in most of them" became "The existence of over 40 salons in Warsaw, and Chopin's participation in majority of them are documented" in RILM.

Value-added Elements

Value-added elements in the evaluated records are those elements containing (1) correct information for a

**Figure 1.** Percentage of supplied abstract elements edited by RILM

field but that may not be used in the final RILM record (Correct, unused) and (2) information in the “Additional information” element. RILM edited out Correct, unused values because they deemed the values unnecessary for an accurate description of the article. Several elements contained Correct, unused values, including “Translated title,” “Serial date,” “Special features,” “Languages of summaries published within an item,” and “Non-English abstract,” for a total of 19 instances. “English” was provided 6 times in the “Languages of summaries” element—the most Correct, unused values provided for each element. They appeared 2, 4, 4, and 3 in the remaining elements, respectively.

Contributors supplied additional information for 23 records. The type of information fell into two categories: user value (i.e., information providing additional context for the article such as keywords and other descriptive elements) and management (i.e., information helpful for the management of records in the database). Supplied content for the user-value elements include time period, theme of volume, ISBN of volume, and keywords. The management-content values included notice of related record in RILM, notification of errata in another volume, and URL of online journal. Some information appeared in some form as a part of the final records (e.g., some keyword concepts became subject headings), while others did not.

Discussion

The objective of this study was to evaluate the baseline quality of contributor-supplied metadata to the RILM Abstracts of Music Literature database by comparing the final high-quality RILM record to the raw metadata submitted by contributors. The metadata was evaluated from several perspectives: Were all required elements supplied in each record? Were the values supplied in the correct format for its element? Were the values supplied semantically correct? Also, what value-added elements were present throughout the records evaluated?

Evaluating completeness, format, and content of each metadata record addressed the organizational and subject expertise currently reflected in the contributor-supplied metadata records. Though a few records were missing author name/function pairs, contributors completed all of the required elements. If completeness is scoped in terms of information supplied and not elements completed, then all but 2 records are complete. In other words, contributors in this study provided more than just the required elements; they also provided additional descriptive information, though the data may not appear in the most appropriate field according to RILM’s standards. In a few cases, contributors supplied additional information that could assist in the management of records in the database that may have become a part of the final high-quality RILM

record. Syntactically, the quality of contributor metadata records in this study was good when compared to the final RILM record.

Organizational expertise was most closely linked with the structural errors measured in this evaluation. Elements with the strictest formatting requirements were those with most of the structural errors. AC errors were by far the most common. In cases such as “Serial date” and “Periodical title,” the correct format is at times different from how the information appears in the journal. Conversely, “Author name,” another highly controlled field, contained very few errors. While contributors indicated awareness of the importance of full author names for searching and retrieval, the data suggest that the same may not be true of other controlled bibliographic fields. As with other elements, a dropdown menu for journal titles and author names could reduce the number of structural errors in the contributor metadata and time spent editing. Some of the capitalization and punctuation errors would also be addressed if, rather than entering values, contributors could select from a list. Structurally, the quality of contributor-supplied records was both acceptable—because contributors supplied correct values for elements with one or two standard formats such as “ISSN” and “Author name”—and not acceptable—due to the varying formats for elements such as “Periodical title” that caused more errors.

Subject expertise was related to the semantic content errors evaluated. Semantic errors occurred across a majority of fields. While many values were edited by RILM, few were completely wrong. Generally, RILM made minor edits to words and numerals (e.g., an extra integer in the “Issue no.” field or replacing “music of the church” with “church music” in the “Translated title” field). Other times RILM moved information from one field to another (e.g., RILM moved translators from the “English abstract” to the author name/function fields). The “Special features” and “English abstract” fields contained the most Edited error instances, yet both are unique cases. RILM consistently exchanged terms 12 times in the “Special features” field (e.g., changing “sound recordings” to “sound files”). The new terms are not available in the contributor interface and appear to be updated terminology. In the case of “English abstract,” each instance of rephrasing or substitution counted as a semantic error. However, when semantic content of abstracts was evaluated based on published guidelines, errors occurred at a rate of less than 1 in every 2 abstracts. The error rate percentage was higher in abstracts written by authors than in those written by someone other than the author of the article. The data suggest that contributors followed abstract guidelines for those abstracts they authored, but made few or no edits to ensure author abstracts conformed to guidelines, as RILM edited three-fifths of the abstracts written by the authors.

Contributors used both the abstract and additional information elements to supply other descriptive information beyond the scope of available elements. Contributors' values in the "Additional information" field support Hanrath's findings that contributors desired additional fields for their metadata records.³² However, translators and keywords supplied in the "English abstract" field suggest that a greater understanding of certain fields in the context of the database may be needed. For instance, contributors supplied no other "author type" (e.g., interviewee, translator) than the traditional author function. The quality of metadata was slightly better than that of structural metadata. In many cases, the content was supplied in the record, but may have been in an incorrect field.

High-quality metadata is defined to contain both organizational and subject expertise. Contributors' subject expertise was reflected in the results as the content for many of the fields was supplied, though perhaps not in the appropriate RILM field. Semantically, contributor-supplied metadata evaluated in this study was high quality. To generate true high-quality metadata, however, a method to improve the structural aspect of contributor metadata is essential.

Study Limitations

Limitations to this study stem primarily from the records evaluated. First, the records are only of the "article in a periodical" type. The quality of other record types in RILM may be different and worth exploring. Second, the records evaluated do not represent a random sample of "articles in a periodical" records from the RILM database. The records are from sets of submissions from 1998, 2000, and 2004. Third, some contributors submitted multiple records at one time, resulting in many contributors having successive submissions from the same issue of a journal title. Errors made in one record tended to be repeated throughout a round of submissions. Successive submissions also limited the pool of contributors evaluated. Finally, the abstract-content analysis focused solely on English abstracts.

In the context of the metadata quality literature discussed, some aspects of the evaluation methods were not addressed or duplicated in this paper. The timeliness/currency quality factor was not examined and quality was evaluated only at one point of evaluation—a Web submission form. Metadata quality may differ with other record-creation instruments.

Implications for Further Research

In addition to ongoing development and refinement of methods to evaluate metadata quality, subsequent research should consider approaches to improving the human-

generated metadata and improving the systems for creating metadata. Further exploration investigating the thought process of contributors when creating metadata may inform the design of systems. Questions such as how contributors choose the next best alternative for information and what additional information contributors need to better describe an item could help diminish error rates and increase quality. Additionally, how can instructions and further guidelines improve the quality of contributor-supplied metadata, if at all?

In terms of systems, the Web interface for metadata creation may have had an effect on the quality, particularly with regard to punctuation and capitalization. How exactly does the interface affect the quality of metadata? What aspects of the interface work well? Can new automatic elements be introduced to "pre-enhance" records? Also, when designing metadata creation systems, how can the interface best be configured to help identify corrections and streamline the review/enhancement process? Improving the system or interface should allow contributors to produce high-quality metadata records without having a great deal of organizational expertise.

Conclusion

The purpose of this paper was to serve as a baseline study of the contributor-supplied metadata using the RILM Abstracts of Music Literature. Secondly, this paper evaluated the quality of metadata when given specific content guidelines. The baseline quality of contributor metadata from the records evaluated was semantically good, yet opportunities for structural improvement exist. The analysis of the "English-abstract" field shows that guidelines can greatly improve the semantic quality of supplied values by further defining and clarifying a field's parameters. This study demonstrates that contributors can supply high-quality basic metadata that is useful to metadata professionals in creating records of publishable quality. RILM's model of collaborative metadata generation holds promise for the greater metadata community. Because they can create good quality metadata, contributors could be a viable source for metadata generation in the effort to reduce the metadata bottleneck. The onus is on the metadata community to build systems and interfaces that harvest contributor semantic content, while leveraging a contributor's discipline knowledge. Efficient, usable systems and interfaces allowing contributors to supply subject expertise while simultaneously guiding correct structural entry of metadata should not only benefit the contributor by increasing the ease of and reducing the time needed for record creation, but also the global community as higher-quality metadata records are available earlier—a positive outcome of collaborative metadata generation.

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Appendix. Submission Form Fields for "Articles Appearing in a Periodical"

Title/Subtitle*	Volume
Translated Title	Issue No
First Author*	Serial Date
First Author function**	Year of Publication*
Second Author*	Page Numbers
Second Author function**	Country of Publication**
Third Author*	Special Features**
Third Author function**	Language(s) of article**
Fourth Author*	Language(s) of summaries published within the item**
Fourth Author function**	English Abstract
Fifth Author*	Name of Abstractor
Fifth Author function**	Non-English Abstract
Periodical Title*	Additional Notes
ISSN	Keyer

*required fields

**value-list/controlled vocabulary in radio button or dropdown box input type

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A Review and Analysis of Library Availability Studies

By Thomas E. Nisonger

The concept of availability (can a library patron locate a desired item on a library's shelves?) and Kantor's branching method for identifying barriers to availability (acquisition, circulation, library operations, and the user) are described. A literature review identifies more than fifty investigations of availability reported in journal articles, dissertations, theses, or conference presentations during the last quarter century. The mean availability rates for known-item searches by actual patrons of 61.3 percent or 63.1 percent (depending on the calculation method) are quite similar to the 61 percent found in an earlier review covering the years 1934 to 1984. Analysis of availability in Kantor's branches shows variation among libraries, but no branch standing out as a major barrier. The paper concludes with the argument that the traditional availability measure can be modified for use as an objective, user-centered evaluative tool in the electronic environment.

Libraries and the library and information science (LIS) discipline are in the midst of a rapid paradigm shift, calling for new research approaches and evaluative measures. During the twentieth century a host of library evaluation techniques that generally focused on the collection itself, including the checklist approach, circulation studies, and the Conspectus, were developed for a relatively stable, mostly print environment. See Lockett for a synopsis of the major approaches.¹ The Association of Research Libraries (ARL) New Measures Initiative and LibQual, among several possible examples, illustrate how the discipline is now searching for new, user-centered evaluation strategies suitable for a more complex, hybrid print-electronic environment, which may soon morph into an all-electronic environment. This paper concludes with the suggestion that a proven library evaluation technique that has been used for more than seven decades, usually termed an "availability study," can be modified to help meet the evaluation challenges in the emerging environment.

The word "availability" can have a wide variety of meanings, including a politician's availability as a candidate for office or someone's availability for a Saturday night date. Within LIS, the term has been applied to a variety of contexts, including the holding of a journal title by a library or the ability to obtain a book in the out-of-print market, among numerous credible examples.² Yet, availability has a well-established and fairly specific meaning as a library performance or collection evaluation measure. It has been defined as "the extent to which patron needs for specific documents are promptly satisfied" and "immediate access to known-items sought."³ In essence, availability tests whether a library patron can immediately find whatever document he or she is seeking in the library. The terms "shelf availability study," "failure study," or "frustration study" have alternatively been used for this method or variations upon it.

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Availability is often considered a measure of library effectiveness or overall performance. As White stated, “The user doesn’t care that the library owns a million books if he can’t find the one he wants.”⁴ Availability studies have been compared to systems analysis because they view the library as a system for providing documents demanded by patrons and can identify which subsystem, such as acquisitions or circulation, is responsible for failure.⁵ Investigation of availability constitutes an established LIS research approach that has been used in doctoral dissertations, master’s theses, and many refereed journal articles.

The majority of availability studies have been “real,” as they were based on surveying actual library patrons during designated time periods, usually asking them to complete a questionnaire reporting the items sought and whether they were found. Some studies have been simulated with library staff checking the shelf availability for a list of citations. A few studies have used log records of patron OPAC searches.⁶ A number of investigations have taken a macro approach, simply calculating an overall availability rate. Many have been conducted at a micro level, using Kantor’s branching technique (as will be explained further in this paper) to analyze why books and articles were not available. This macro-micro distinction is based on Lancaster’s work.⁷

A number of sources have reviewed the advantages and disadvantages of availability studies, including Lockett, and Bachmann-Derthick and Spurlock.⁸ The advantages of the approach include: provision of objective data concerning the library’s ability to meet patron need, use of a well-established methodology, and repeatability at later or even regular intervals allowing longitudinal comparison. Also, bottlenecks can be identified and policy changes or appropriate corrective actions can be made.

The disadvantages associated with availability tests are their design and implementation can be relatively complex and time-consuming; user cooperation is required; users may not accurately report the necessary information; the needs of nonusers are not addressed; and, because they are based on a sample, they only provide an estimate of overall availability.

This paper’s purpose is to review and tabulate the results of more than thirty-five studies reporting more than fifty availability tests conducted or published since the early 1980s, focusing on overall availability rates and the reasons items were not available to patrons. The potential applicability of the availability concept to the electronic environment is then advocated.

A Brief Historical Sketch of Availability Studies

Studies of availability have appeared in the literature for

at least seven decades. Gaskill, Dunbar, and Brown’s 1934 use survey at the Iowa State College library calculated the percentage of time both undergraduate students and graduate students “obtained what they sought” and identified eleven reasons for failure to locate the sought-after book or magazine.⁹ In 1975, Buckland’s major monograph, *Book Availability and the Library User*, based on research at the University of Lancaster, reported that circulation was the major barrier to book availability, and recommended variable loan periods and purchase of duplicate copies to increase availability.¹⁰

At least forty availability studies were published between the 1930s and the mid-1980s, according to a seminal literature review and analysis published in 1986 by Mansbridge.¹¹ He discovered that most investigations were based on known-item searches conducted in academic libraries, while two-thirds were based on real users, and the remaining third used a set of citations simulating user needs. This literature review will only mention the most seminal items included in Mansbridge, while focusing on research published later or not covered by him.

Kantor’s Branching Method

“The branching method,” developed by Kantor during the 1970s, is probably the best-known availability technique and the one most frequently employed in research. Kantor’s original 1976 article, which reported results at Case Western University’s Freiburger Library, outlined four branches or barriers to patron “satisfaction” in obtaining a desired book, which are generally termed: “acquisitions”—it was not acquired; “circulation”—it is checked out to another patron; “library operations”—it is not in the correct shelf location; and “the user”—it can not be located when correctly shelved.¹² Later modifications added a “bibliographic” branch—the user did not have the correct citation—and a “catalog” branch—the user could not locate the book in the catalog and record the correct call number.¹³ Rashid used a “collection development policy” branch (actually a subdivision of the acquisitions branch), whereby the desired title was not covered by the collection development policy’s scope.¹⁴ Two additional branches have been used in the small number of studies of subject searching—i.e., the patron is seeking a book on a particular subject rather than a specific title—“appropriate title,” in which the patron deems a book listed in the catalog inappropriate due to such factors as age, language, or reading level; and “matched query,” in which the client fails to find a subject heading in the catalog matching his or her information need.¹⁵

Numerous permutations of branches have been used in the studies based on Kantor’s methodology. The three most frequently used sets of branches for known-item searches by patrons are

- Acquisitions, Circulation, Library Operations, User;
- Acquisitions, Catalog, Circulation, Library Operations, User; and
- Bibliographic, Acquisitions, Catalog, Circulation, Library Operations, User.¹⁶

Other less frequently employed permutations include “Acquisitions, Catalog, Circulation, and Library”—because the investigation took place in a closed stack library; “Bibliographic, Collection Development, Acquisitions, Catalog, Circulation, Library Operations, and User”; and “Acquisitions, “On-the-Shelf.”¹⁷ Some studies have combined branches, such as circulation and library operations.¹⁸ Variant terminology has occasionally been used—e.g., “selection” for “acquisitions” or “retrieval” for the “user” finding the document on the shelf.¹⁹ Each of the branches described above represents a barrier to the user locating a sought-after book or item. Failures in different branches have been variously termed as “dissatisfactions,” “errors,” or “malfunctions” throughout the literature.

ARL published a detailed manual by Kantor explaining the implementation of his branching method, and some collection evaluation and library performance guides or textbooks, such as one by Hall, have provided succinct summaries of the technique.²⁰ During the 1980s, doctoral dissertations using Kantor’s method were completed at Case Western Reserve University by Kuraim, Ajlan, Abduljalil, and Rashid, as well as at Rutgers by Ciliberti.²¹ Kantor’s branching analysis has also been applied in master’s papers or theses written at the University of North Carolina at Chapel Hill by Roberts and Chandler, the University of the Punjab in Pakistan by Bashir, and the University College of Wales by Salter.²²

The fact that Kantor’s branching method has been implemented in the United States, Europe, Africa, Asia, the Middle East, and Australia testifies to its wide international acceptance. In the United States, not counting studies already covered in Mansbridge’s literature review, it has been used at

- the University of Illinois Health Sciences Center by Kolner and Welch;
- the William Patterson College Library by Ciliberti et al., and Mitchell, Radford, and Hegg;
- the University of California at Santa Cruz Library by Ferl and Robinson; and
- the San Jose State University by Thorne and Whitlatch.²³

Internationally, it has been utilized at

- a Tokyo city library system in Japan in a severely modified form by Tamura and Sakai;

- Liverpool Polytechnic Library Service in the United Kingdom twice by Revill;
- the Friesland Provincial Library in the Netherlands by Lieshout;
- the University of the Punjab in Pakistan by Rehman and Bashir;
- the University of Western Australia by Harris and Garner;
- the University of Münster in Germany by Boekhorst;
- the International Islamic University in Malaysia by Rehman, Arif, and Chaudhry;
- the King Fahd University of Petroleum and Minerals in Saudi Arabia by Chaudhry and Ashoor;
- the University of Zululand in South Africa by Zondi;
- four universities in the state of Tamil Nadu in India by Urs and Dominic; and
- a simulated study at the University of Cape Town Medical Library by Steynberg and Rossouw.²⁴

Kantor’s method has been primarily used for known-item searches by actual patrons in academic libraries, although it also has been employed in

- the Shaker Heights Senior High School and Cleveland Heights High School libraries in Ohio by Abduljalil;
- the Cleveland Heights-University Heights Main Public Library by Wood, Bremer, and Saraïdaridis and by Kuraim;
- the Cameron Village Regional Library in North Carolina in a simulated study by Chandler; and
- a Tokyo city library system by Tamura and Sakai.²⁵

While the method has primarily been used to measure book availability to actual patrons, it has also tested the availability of

- journal articles at the University of New Mexico by Bachmann-Derthick and Spurlock;
- journal articles at Adelphi University by Ciliberti et al.;
- journal articles at the University of North Carolina Health Sciences Library by Shaw-Kokot and Varre;
- both books and articles at the University of Western Australia by Harris and Garner; and
- both books and articles at the King Fahd University of Petroleum and Minerals by Chaudhry and Ashoor.²⁶

Kantor’s method has also been employed for analysis of subject searching at William Patterson College by Ciliberti et al., plus Mitchell, Radford, and Hegg; and at Adelphi University by Ciliberti et al.²⁷

Other Approaches to the Study of Availability

Various availability tests have been developed as performance or so-called “output” measures for public libraries. *Performance Measures for Public Libraries*, by De Prosopo, Altman, and Beasley, proposed and tested in twenty U.S. public libraries a simulated shelf availability measure using samples of book titles from the *American Book Publishing Record* and each library’s shelvest plus periodical articles selected from leading indexes.²⁸ *Output Measures for Public Libraries*, by Van House et al., includes three availability measures according to type of search: the Title Fill Rate, the Subject and Author Fill Rate, and the Browsers’ Fill Rate.²⁹ The “title fill rate,” as a known-item search, is essentially equivalent to the author-title searches generally used by those implementing Kantor’s method. *Output Measures for Public Library Service to Children*, by Walter, contains a “children’s fill rate,” “homework fill rate,” and “picture book fill rate.”³⁰ Its companion volume of output measures for young adult services incorporates a “young adult fill rate” and a “homework fill rate.”³¹ While some public libraries have simply posted availability scores on the Web without reporting details of the study, this review is limited to formal research reports (e.g., Simpson at the Pikes Peak Library District and Thompson at Augustana College Library).³²

A few studies have calculated availability based on patron known-item searches without using Kantor’s branching analysis or explicit “fill rates,” such as those conducted at Macquarie University in Australia by Knox and Wivell, and at Cardiff University in the United Kingdom by Wall and Williams.³³ Simulated availability studies not involving actual patrons have been conducted at the University of Illinois at Urbana-Champaign by Stelk and Lancaster, the University of Cape Town by Steynberg and Rossouw, and the Cameron Village Regional Library in North Carolina by Chandler.³⁴ In addition, simulated investigations have supplemented “real” studies at the Cleveland Heights-University Heights Main Public Library by Kuraim, and the King Faud University of Petroleum and Minerals by Chaudhry and Ashoor.³⁵

Accessibility Studies

Related, yet distinct from availability, is the concept of accessibility, which measures the amount of time required to obtain a document (from either internal or external resources) rather than its immediate availability. Similar to availability, the term “accessibility” is sometimes used inconsistently in the literature. The best-known accessibility measure was developed during the late 1960s and early 1970s, and has entered LIS lore as “Orr’s Document Delivery Test” (DDT).³⁶ In this technique, the time required to obtain a sample of approximately 300 documents is used to calculate a Capability Index ranging from 0—no documents available within a week—to 100—all documents available within

10 minutes—which would be considered availability. Orr’s test has been implemented in 92 U.S. medical libraries by Orr and Schless; 2 Canadian LIS libraries by Penner; 13 California secondary school libraries by Greenberg; and 7 South African medical libraries by Steynberg and Rossouw.³⁷ Although Orr’s DDT was not used, the comparative accessibility of books through recall or interlibrary loan was recently investigated at Iowa State University by Gregory and Pedersen.³⁸ Tangential to document delivery tests are the numerous performance evaluations of interlibrary loan and commercial document delivery, which include “turnaround” or delivery time as an important variable. This author tabulated the results from approximately 30 such studies published during the 1990s.³⁹ It is beyond this paper’s scope to analyze the results of accessibility studies.

An Analysis of Availability Studies Conducted During the Previous 20 to 25 Years

This section analyzes the results of the availability studies issued since Mansbridge’s literature review (the cutoff date was 1984) as well as a small number of studies published between 1980 and 1984 not included in Mansbridge—mainly Ph.D. dissertations, a format he did not address. Appendix A summarizes 46 investigations of availability based on actual clients conducting known-item searches that were published from 1980 to 2001, listing the author, publication date (or degree date for dissertations), institution, sample size, the number of successful searches, and the overall availability rate. For the purpose of consistency and accurate comparison, the availability percentages have been calculated by the author to the first decimal point based on the data reported by the original researchers. Recalculation of the initially reported percentage was sometimes necessary due to inconsistent practice in rounding off numbers by some researchers, inexplicable errors in the originally reported percentage, or cases in which the researchers derived a final percentage by multiplying the percentage results at each branch (the method used by Kantor) rather than by simply dividing the number of successes by the total number of searches. Instances in which the percentage in appendix A differs by more than half a percentage from that which was initially reported are noted in footnotes to the appendix.

Examination of appendix A reveals that overall availability ranged from 33.8 percent at the University of Münster to 83.8 percent at Cardiff University. The high rate at the latter can probably be attributed to the study’s focus on “short loan,” items—i.e., “reserve” in North American terminology. Twenty-nine of the 46 reported results showed an availability rate in the 50s or 60s percentage range. The unweighted mean availability rate (with each of the 46 percentages

counting equally) is 61.3 percent, a figure remarkably similar to the 61 percent reported by Mansbridge, who used this method for calculating the mean.⁴⁰ However, Mansbridge found a larger range in the results from different studies (8 to 89 percent).⁴¹ This literature review's weighted mean (a calculation method not used by Mansbridge that factors in the size of each investigation) was 63.1 percent (17,801.3 successes in 28,207 searches) for 43 investigations. Excluded from calculation of the weighted mean were Simpson's two surveys at the Pikes Peak Library District (for which the raw data is unavailable) as well as Jacobs and Young's University of Sussex research, where the 99,778 searches would badly skew the overall average. The 61 or 63 percent mean availability rates found in this review are a bit higher than the general 50 to 60 percent range cited by Bachmann-Derthick and Spurlock; Lieshout; Ciliberti et al.; and Chandler.⁴²

The three cases focusing exclusively on serial or journal articles, Bachmann-Derthick at the University of New Mexico, Roberts at East Tennessee State, and Ciliberti et al. at Adelphi University, found lower-than-average availability rates, 55.7 percent, 54.5 percent, and 44.9 percent, respectively.⁴³ Among the investigations addressing multiple formats, Chaudhry and Ashoor's study at King Fahd University reported a 58.6 percent availability rate for journal articles, while Harris and Garner found a 54 percent serials availability rate at the University of Western Australia.⁴⁴ While these data might lead to a facile assumption of a lower general availability rate for serials (and a confirmation of the longstanding perception that serials cause difficulties), in the final analysis, the number of cases involving serials is too small to allow firm conclusions.

As indicated in appendix A's footnotes, three studies measured the availability rate before and after librarian intervention. (Note that the vast majority of availability studies have not included librarian assistance as a factor in the equation, so only the initial result is included in appendix A's final column.) A librarian's help increased availability at the Cleveland Heights-University Heights library from 52.4 to 60.8 percent (Kuraim's study), at the Cleveland Health Sciences Library from 59.6 to 63.5 percent (Rashid's study), and from 62.8 to 68.5 percent at the King Fahd University of Petroleum and Minerals (Chaudhry and Ashoor's study).⁴⁵ These investigations suggest, as one would intuitively think, that librarian assistance does result in somewhat higher availability.

The small number of subject-based availability studies (not tabulated in appendix A) display less variation in their availability rates than was apparent in the known-item searches, although the results were comparable. Overall availability was 56.8 percent (108 of 190 searches) and 62 percent (31 of 50 searches) at William Patterson College and 62.2 percent (153 of 246 searches) at Adelphi University or 60 percent, as reported by Ciliberti et al., if the avail-

ability rates at each of Kantor's branches are multiplied by each other.⁴⁶

Following appendix A's format, appendixes B through G summarize availability at each of Kantor's branches, covering respectively, the bibliographic citation, acquisitions, the catalog, circulation, library operations, and the user. While the fractional results occasionally reported in these appendixes may seem counterintuitive, they are easily explained by the location of one volume of a multivolume title, or the use (in a few studies) of a "correction factor" to distribute proportionately among the branches failed searches for which the precise cause could not be determined. Not represented in these appendixes are the investigations that did not employ Kantor's branching technique plus the reports by Zondi as well as Thorne and Whitlatch, where useable data were not presented.⁴⁷

Appendix B shows a consistently high level of availability at the bibliographic branch, ranging from 94.9 to 100 percent. The unweighted mean availability for the nine reported cases is 97.1 percent, while the weighted mean is 97.7 percent (6,990 of 7,154 searches were successful). Failures in this branch were usually due to incorrect citations for the author or the title.

Appendix C tabulates 33 reported cases of availability at the acquisitions branch—the branch most frequently included in studies employing Kantor's methodology. While availability ranged from 66.1 to 97.2 percent, it exceeded 90 percent in the majority of instances (17 of 33) and was more than 80 percent on all but six occasions. It is noteworthy that the two lowest availability rates, 68 percent and 66.1 percent, appear in studies of journal articles by Roberts at East Tennessee State University and Ciliberti et al. at William Patterson College.⁴⁸ However, the findings from the other two studies focusing on journal articles, Bachmann-Derthick and Spulock at the University of New Mexico (85.2 percent) and Shaw-Kokot and Varre at the University of North Carolina at Chapel Hill (94.4 percent), are generally consistent with the other results in the appended table.⁴⁹ The unweighted mean availability rate for these 33 reported results at the acquisitions branch is 87.1 percent and the weighted mean for 32 cases (all but Revill's 1988 study at the Liverpool Polytechnic Library Service, which reported availability percentages but no raw data for the branches) is 89.6 percent with 19,080 successes among 21,299.9 sought-after items.⁵⁰ At the sub-branch level, the predominant reason for failure was the fact the library had not acquired the item. Other causes of acquisitions failure included weeding, cancellation, the sought-after item's location in a different branch, the item having been declared missing, and an "on order" title having not been received.

Appendix D demonstrates a high success rate at the catalog branch, with the reported availability percentages running from 86.4 to 99.6 percent. Indeed, the rate was

more than 90 percent in 20 of 21 instances and more than 95 percent in more than half the cases (11 of 21). The unweighted mean availability rate was 94.7 percent and the weighted mean 96.5 percent (13,328.4 of 13,806). Appendix D's footnotes show that librarian assistance increased availability at this branch at the Cleveland Heights-University Heights Public Library from 93.4 to 98.8 percent (Kuraim's study) and at the Cleveland Health Science Library from 96.9 to 98.6 percent (Rashid's study).⁵¹ Frequent reasons for catalog branch failure were inability to locate the record in the catalog as well as transcription of an incorrect call number or an incorrect location.

Despite early studies identifying circulation as a major barrier to book availability, success rates in the circulation branch, presented in appendix E, exceeded 80 percent in all but four instances, ranging from 66.2 to 100 percent. The circulation branch's unweighted mean availability rate for 31 reported results was 87.9 percent and the weighted mean for 30 cases, excluding Revill's 1988 study, was 87.4 percent (16,899.73 of 19,337.7).⁵² It is noteworthy that each of the three investigations of journal articles found high availability rates in this branch: Bachmann-Derthick and Spurlock (96.7 percent), Roberts (97.5 percent), and Ciliberti et al. (100 percent), possibly reflecting the fact that journals are less likely to circulate.⁵³ As would be expected, the overwhelming majority of circulation failures were attributable to the item being checked out by a patron while another reason was checking for interlibrary loan purposes.

Appendix F's tabulation of 31 availability rates in the library operations branch shows a range from 65.7 to 98.9 percent with more than half (18) exceeding 90 percent and only four less than 80 percent. This branch's unweighted mean availability rate is 88.8 percent, and the mean weighted rate, for one less case with the 1988 Revill study not counted, stands at 89.9 percent (15,185.6 successes in 16,889.73 attempts).⁵⁴ Of library branch failures, major causes of error were missing items, bindery operations, reshelving operations, misshelved items, and items in technical processing.

Appendix G tabulates success rates at the user branch as defined and reported by the original investigators. This branch almost always includes user failure to locate the item on the shelf, but may also include user failure with the bibliographic citation or in the catalog. Ranging from 77.7 to 96.6 percent, the user success rate exceeded 90 percent in 18 of the 32 reported results and was less than 80 percent only once. Both the unweighted means (32 instances) and the weighted means (31 instances with 13,833 satisfactions out of 15,413.8 searches) equal 89.7 percent. A high proportion of user errors was due to the inability to locate the item on the shelf, while another cause of failure was the user not understanding the classification system.

Whereas appendixes B through G summarize success rates in each branch, appendix H analyzes failures by

branch, indicating for the various studies the number and percentage of failures attributed to each branch. In order to provide a more accurate estimation of total user failure, appendix H's user column combines the results from appendix B (user bibliographic failure), appendix D (user failure at the catalog), and appendix G (user failure at the shelf or overall user failure). The findings have been calculated by the author from the original researchers' raw data.

Within each branch, appendix H shows wide variation in the proportion of failures attributable to the branch, ranging from 5.9 to 70.4 percent in acquisitions; 0 to 50 percent in circulation; 1.4 to 46.4 percent in library operations; and 6.7 to 42.9 percent for the user. Of 8,991.7 total failures, 25.3 percent were in the acquisitions branch; 27.1 percent in circulation; 19.0 percent in library operations; 24.7 percent by the user; and 3.9 percent were not solely attributable to any of these branches. Disregarding the four investigations (Wood, Bremer, and Saraidaridis; Kuraim; Tamura and Sakai; and Jacobs' fall survey) that did not include all of these branches, the largest portion of failures was caused by the circulation branch in eleven cases; the acquisitions branch in eight cases; and library operations and the user in five cases each.⁵⁵ While Mansbridge concluded that circulation and library operations were the largest source of book unavailability in academic libraries, this analysis found that the highest percentages of total failures were in the acquisitions and user branches, and that the circulation and acquisitions branches were the largest cause of failures in the most cases.⁵⁶ However, it is apparent from careful review of the data that no branch emerges as the major obstacle to availability.

Appendix I summarizes the results of simulated studies that did not involve actual patrons. Note that Kuraim as well as Chaudhry and Ashoor included both real and simulated components in their research projects.⁵⁷ Availability ranged from 13 to 84 percent with an unweighted mean of 61.8 percent and a weighted mean of 60.6 percent (2,010 successes out of 3,315)—figures quite similar to the averages for real studies. One would intuitively anticipate a higher availability rate in a simulated study because user errors would be eliminated and, when a shelflist sample is being used, the items would already have been acquired by the library. Indeed, when the one outlier (the 13 percent availability in Kuraim's sample from the *American Book Publishing Record*) is disregarded, the mean availability rates increase to 68.8 percent (unweighted) and 69.1 percent (weighted with 1,945 of 2,815 on the shelf).⁵⁸

Finally, many of these studies have addressed subsidiary issues beyond the scope of this analysis, such as

- whether user type (student or faculty, full or part-time student, and so on) is a variable influencing the ability to locate items;
- comparison of the performance of different libraries; and

- longitudinal comparisons within a single library.⁵⁹

Summary

This literature review and analysis of more than fifty specific investigations of availability found that the majority used Kantor's branching method (but numerous combinations of branches), were implemented in academic libraries (with some in public and school libraries), and were for known-item searches by actual patrons. About half the studies were conducted in U.S. libraries with the remainder carried out in ten other countries.

There is considerable variation among libraries in overall availability as well as availability in different branches. One of the values of these studies is the identification of reasons for lack of availability in a specific library context. Branch-level analysis shows that availability at each branch only occasionally falls below 80 percent and frequently exceeds 90 percent. Moreover, no branch stands out as the major bottleneck or barrier to availability. This study, in conjunction with Mansbridge's review, demonstrates that, in a print environment, patrons on average find what they are looking for only slightly more than 60 percent of the time. An obvious question concerns what the availability rate would be for electronic resources on the Web or licensed by a library.

A New Definition of Availability

More than a decade ago, Kaske argued that the availability concept was no longer applicable to the then current environment because user needs were often met through externally-procured print items. He advocated the development of a new availability model that would incorporate the searching of multiple libraries and the time the user could wait to obtain the item.⁶⁰

Expanding upon Kaske, this paper maintains that the traditional availability concept reviewed here can be adopted with modification for an electronic environment to measure user success in immediately obtaining sought-after items on the Web or in the proprietary e-resources licensed by a particular library. While many patrons may no longer expect the immediate gratification of finding an item on a library shelf, they may nevertheless expect immediate gratification in locating it electronically. The extent to which they are successful in doing so can serve as an objective, user-centered evaluation and performance measure in the newly emerging electronic environment. Such tests could also identify barriers to user success and facilitate the design of better electronic systems.

A detailed outline of the procedures for conducting an electronic availability study is beyond this paper's scope. As

with traditional availability studies, the method would work best for known-item searches by real users, although a simulated study would be a possibility.

Future Research

Future research issues regarding electronic availability studies include

- development of a method for measuring availability of electronic resources;
- determination of an expected standard for availability rates in an electronic environment;
- comparison of electronic availability rates with those reported in the numerous studies conducted in traditional print environments; and
- identification of the major barriers to electronic availability and the relative success rates at the various barriers.

One might hypothesize the following potential barriers or branches: the item is not on the Web; the URL has changed; the item is only available in a proprietary database that is not licensed by the user's library; the maximum licensed number of simultaneous users are logged on; technological failure, such as a server is down or the local power off; and the user is unable to locate an otherwise available item. Many of the issues that have been investigated in typical availability studies could be addressed in an electronic availability study. Examples would include

- comparative availability among different user groups;
- comparative availability among libraries;
- longitudinal comparison within a library;
- the impact of professional assistance to the user upon availability; and
- the impact of policy changes on availability.

Finally, one could design and conduct electronic accessibility tests, modeled on Orr's DDT, to ascertain the time required to obtain electronic documents.

Conclusions

While availability studies are sometimes viewed as a research approach from the 1970s and 1980s, this literature review has demonstrated their continued use on an international scale throughout the 1990s and into the twenty-first century.⁶¹ Although developed for a print environment, the issues

investigated in an availability study are equally relevant to an electronic environment. Mansbridge contended that an availability study could be used for nonlibrary purposes, such as analyzing the availability of audio-visual equipment in an academic setting.⁶² If, at some future point, libraries cease to exist or are radically transformed into now unrecognizable entities, an electronic availability study could still be employed in an academic institution as an objective, user-centered evaluation measure to help assess how effectively faculty and student information needs are being met.

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50. Revill, "An Availability Survey in Cooperation with a School of Librarianship and Information Studies."
51. Kuraim, "The Principal Factors Causing Reader Frustration in a Public Library;" Rashid, "Book Availability as a Performance Measure of a Library: An Analysis of the Effectiveness of a Health Sciences Library."
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Appendix A. Known-Item Search Availability Rates in Studies Incorporating Library Patrons

Authors	Pub. Year	Library	Number of Searches	Successes	Percent Available
Wood, Bremer, and Saraidaridis ¹	1980	Cleveland Heights-University Heights Main Public Library	350	132	37.7
Kuraim ²	1983	Cleveland Heights-University Heights Main Public Library	500	262 ³	52.4
Tamura and Sakai ⁴	1983	a Tokyo city library system	68	54	79.4
Abduljalil	1985	Cleveland High School	432	203	47.0
Abduljalil	1985	Shaker Heights High School	432	236	54.6
Ajlan	1985	King Saud U., Saudi Arabia	500	265	53.0
Ajlan	1985	U. of Petroleum and Minerals, Saudi Arabia	500	268	53.6
Kolner and Welch	1985	U. of Illinois Health Sci. Lib.-Peoria	760	447	58.8
Kolner and Welch	1985	U. of Illinois Health Sci. Lib.-Rockford	65	35	53.8
Kolner and Welch	1985	U. of Illinois Health Sci. Lib.-Chicago	60	44	73.3
Ferl and Robinson	1986	U. of California, Santa Cruz	408	250	61.3
Ciliberti et al.	1987	Willaim Patterson College	211	107	50.7 ⁵
Revill	1987	9 site libraries of Liverpool Polytechnic Library Services, U.K.	1,458	1,003	68.8
Thompson	1987	Augustana College, 1986 survey	364	258	70.9
Thompson	1987	Augustana College, 1987 survey	235	190	80.9
Knox and Wivell	1988	Macquarie U., Australia Oct. 9, 1986 survey	384	312	81.3 ⁶
Knox and Wivell	1988	Macquarie U., Australia Oct. 26, 1986 survey	290	240	82.8
Revill	1988	9 site libraries of Liverpool Polytechnic Library Services, U.K.	2,064	1,548	75
Bachmann-Derthick and Spulock ⁷	1989	U. of New Mexico	483	269	55.7
Roberts ⁸	1989	East Tennessee U., College of Medicine	297	162	54.5
Rashid	1990	Cleveland Health Sciences Lib.	1,000	596 ⁹	59.6
Simpson	1990	Pikes Peak Library District, 1988 survey	Not reported	Not reported	66
Simpson	1990	Pikes Peak Library District, 1989 survey	Not reported	Not reported	59
Boekhorst	1992	U. of Munster, Germany	751	254	33.8
Harris and Garner	1992	U. of Western Australia, Australia	589 ¹⁰	259	44.0

Authors	Pub. Year	Library	Number of Searches	Successes	Percent Available
Lieshout	1992	Friesland Provincial Lib., Netherlands	401	227.3	56.7
Rehman and Bashir	1993	U. of Punjab, Pakistan	300	124	41.3
Salter	1993	Acton College, U.K.	124 ¹¹	86	69.4
Chaudhry and Ashoor	1994	King Fahd U. of Petroleum and Minerals, Saudi Arabia	607 ¹²	381 ¹³	62.8
Mitchell, Radford, and Hegg	1994	William Patterson College	61	40	65.6 ¹⁴
Rehman, Arif, and Chaudhry	1994	International Islamic U., Malaysia	441	233	52.8
Thorne and Whitlatch ¹⁵	1994	San Jose State U., April 1993	93	61	65.6
Thorne and Whitlatch	1994	San Jose State U., April 1988	499	270	54.1
Thorne and Whitlatch	1994	San Jose State U., April 1983	350	239	68.3
Jacobs	1995	U. of Sussex, U.K., spring 1994 survey	4,103	2,566	62.5
Jacobs	1995	U. of Sussex, U.K., fall 1994 survey	1,585	1,136	71.7
Jacobs and Young	1995	U. of Sussex, U.K.	99,778 ¹⁶	75,126	75.3 ¹⁷
Zondi	1996	U. of Zululand, South Africa	353	178	50.4
Ciliberti, et al.	1998	Adelphi U.	195	119	61.0 ¹⁸
Ciliberti, et al. (journal articles in CD-ROM index)	1998	Adelphi U.	127 ¹⁹	57	44.9
Urs and Dominic	1999	Anna U., India	1,254	855	68.2 ²⁰
Urs and Dominic	1999	Bharathiar U., India	870	460	52.9 ²¹
Urs and Dominic	1999	Bharathidasan U., India	957	544	56.8 ²²
Urs and Dominic	1999	Tamilnadu Agricultural U., India-	1,150	766	66.6 ²³
Wall and Willaims	1999	Cardiff U., U.K.	480 ²⁴	402	83.8
Shaw-Kokot and Varre ²⁵	2001	U. of North Carolina-Chapel Hill-Health Sciences Lib.	2,056	1,663	80.9

Notes

1. Although earlier than the 1984 end point for Mansbridge's literature review, this item was not covered in the review.
2. Not covered in Mansbridge's review.
3. There were 262 successes and a 52.4 percent success rate without librarian assistance increasing to 304 and a 60.8 percent success rate with librarian assistance.
4. Not covered in Mansbridge's review.
5. Overall availability was 53.6 percent for 401 searches, when 190 subject searches were considered.
6. Based on calculation from the raw data of the researchers, who reported a 76.8 percent availability.
7. Journal articles.
8. Journal articles.
9. There were 596 successes and a 59.6 percent success rate without librarian assistance increasing to 635 and a 63.5 percent success rate with librarian assistance.
10. Includes books, reserve items, and serial articles.
11. Results for one day for which complete data was reported. 500 forms were distributed during 5 days, but the number of titles sought is not reported. The five-day availability rate was 70 percent.
12. Includes books and journal articles. When 600 simulated items were also considered, availability was 63.8 percent for 1,207 items.
13. There were 381 successes and a 62.8 percent success rate without librarian assistance increasing to 416 and a 68.5 percent success rate with librarian assistance.
14. Overall availability was 64.0 percent for 111 searches, when 50 subject searches were considered.
15. Thorne and Whitlatch also reported results from April 1979 and April 1976 which are not summarized here because they precede this review's 1980 cut-off point.
16. Patron searches in an online public access catalog.
17. Measured whether books searched for in the OPAC were available for circulation without addressing whether the patron actually located them on the shelf.
18. The overall availability rate was 57.9 percent for 568 attempts when subject searches and searches in a CD-ROM journal index are included.
19. Searches for articles in a CD-ROM journal index.
20. Corrected percentage calculated by author from raw data of Urs and Dominic, who reported 66 percent based on multiplying the success rate percentages at the 4 branches.
21. Corrected percentage calculated by author from raw data of Urs and Dominic, who reported 52 percent based on multiplying the success rate percentages at the 4 branches.
22. Corrected percentage calculated by author from raw data of Urs and Dominic, who reported 55 percent based on multiplying the success rate percentages at the 4 branches.
23. Corrected percentage calculated by author from raw data of Urs and Dominic, who reported 64 percent based on multiplying the success rate percentages at the 4 branches.
24. "Short loan" (i.e., reserve) books.
25. Journal articles.

Appendix B. Availability Rates in Kantor's Bibliographic Branch

Authors	Pub. Year	Number of Searches	Successes	Percent Available
Kuraim	1983	500	500	100
Ajlan, King Saud U.	1985	500	491	98.2
Ajlan, Petroleum and Minerals U.	1985	500	476	95.2
Ciliberti et al.	1987	211	206	97.6
Rashid	1990	1,000	949	94.9
Mitchell, Radford, and Hegg	1994	61	59	96.7
Jacobs, spring 1994 survey ¹	1995	4,103	4,038	98.4
Ciliberti et al.	1998	195	191	97.9
Ciliberti et al., journal articles	1998	84	80	95.2

Note

1. The term "mis-citations" was used for the bibliographic branch.

Appendix C. Availability Rates in Kantor's Acquisitions Branch

Authors	Pub. Year	Number of Searches	Successes	Percent Available
Wood, Bremer, and Saraidaridis	1980	350	287	82.0
Kuraim	1883	500	486	97.2
Tamura and Sakai	1983	68	63	92.6
Abduljalil, Cleveland Heights	1985	432	389	90.0
Abduljalil, Shaker Heights	1985	432	393	91.0
Ajlan, King Saud U.	1985	491	414	84.3
Ajlan, Petroleum and Minerals U.	1985	476	450	94.5
Kolner and Welch, Illinois-Chicago	1985	760	711.5	93.6
Kolner and Welch, Illinois-Peoria	1985	65	56	86.2
Kolner and Welch, Illinois-Rockford	1985	60	55	91.7
Ferl and Robinson	1986	408	368	90.2
Ciliberti et al.	1987	206	185	89.8
Revill	1987	1,458	1,347.5	92.4
Revill	1988	Not Reported	Not Reported	92.0
Bachmann-Derthick and Spurlock ¹	1989	483.2	411.8 ²	85.2
Roberts ³	1989	297	202	68.0
Rashid	1990	899 ⁴	800	89.0
Boekhorst	1992	751	521	69.4 ⁵
Harris and Garner	1992	589 ⁶	478	81.2
Lieshout	1992	401	293.5	73.2
Rehman and Bashir	1993	299.4	250.4 ⁷	83.6
Salter	1993	124 ⁸	117	94.4 ⁹
Chaudhry and Ashoor	1994	606 ¹⁰	555	91.6 ¹¹
Mitchell, Radford, and Hegg ¹²	1994	59	55	93.2
Rehman, Arif, and Chaudhry	1994	441	390	88.4
Jacobs, spring 1994 survey	1995	4,038 ¹³	3,921	97.1
Ciliberti et al.	1998	191	171	89.5
Ciliberti et al., journal articles	1998	127	84	66.1
Urs and Dominic, Anna U.	1999	1,254	1,195	95.3
Urs and Dominic, Bharathiar U.	1999	870	660	75.9
Urs and Dominic, Bharathidasan U.	1999	957	751	78.5
Urs and Dominic, Tamilnadu U.	1999	1,150	1,078	93.7 ¹⁴
Shaw-Kokot and Varre ¹⁵	2001	2,057.30	1,941.3 ¹⁶	94.4

Notes

1. Journal articles.
2. Data includes a built-in correction factor for the 31 cases where it was impossible to determine the cause of unavailability.
3. Journal articles.
4. If data for collection development policy failure (i.e., the policy did not call for the book's acquisition), which Rashid used as a separate branch, is included, 800 of 949 attempts were successful for an 84.3 percent availability rate.
5. The availability rate is 68.3 percent if the 8 items received but not cataloged (which Boekhorst used as a separate branch) are considered. 607 (80.8 percent) were acquired by the library system, but not necessarily available in the main library.
6. Includes books, reserve items, and serial articles.
7. Data includes a built-in correction factor for the 4 cases where it was impossible to determine the cause of unavailability.
8. Based on the one day for which complete data was presented of a five-day study.
9. Calculated by the author from Salter's raw data.
10. Includes books and journal articles. The reason for unavailability could not be determined for 1 item in the 607 item sample.
11. This percentage calculated by the author from Chaudhry and Ashoor's raw data, who erroneously reported 88.1 percent as a result of applying Kantor's branches in reverse order.
12. The term "selection" was used for the acquisitions branch.
13. Calculated by the author from Jacobs' raw data.
14. Urs and Dominic reported 93 percent.
15. Journal articles.
16. Data includes a built-in correction factor for 50 failures due to bibliographic error, bad citations, or undetermined reasons.

Appendix D. Availability Rates in Kantor's Catalog Branch

Authors	Pub. Year	Number of Searches	Successes	Percent Available
Wood, Bremer, and Saraidaridis	1980	287	264.7	92.2
Kuraim	1983	486	454 ¹	93.4
Abduljalil, Cleveland Heights	1985	389	365	93.8
Abduljalil, Shaker Heights	1985	393	375	95.4
Ajlan, King Saud U.	1985	414	377 ²	91.1
Ajlan, Petroleum and Minerals U.	1985	450	430	95.6
Ferl and Robinson	1986	368	346	94.0
Ciliberti et al.	1987	185	170	91.9
Bachmann-Derthick and Spurlock ³	1989	411.8	355.6 ⁴	86.4
Rashid	1990	800	775 ⁵	96.9
Boekhorst	1992	513	488	95.1
Harris and Garner	1992	478 ⁶	433	90.6
Lieshout	1992	293.5	272.3	92.8
Rehman and Bashir	1993	250.4	249.4 ⁷	99.6
Mitchell, Radford, and Hegg	1994	55	54	98.2
Rehman, Arif, and Chaudhry	1994	390	375	96.2
Jacobs, spring 1994 survey	1995	3,921 ⁸	3,881	99.0
Jacobs, fall 1994 survey	1995	1,529 ⁹	1,517	99.2
Ciliberti et al.	1998	171	158	92.4
Ciliberti et al., journal articles	1998	80	77	96.3
Shaw-Kokot and Varre ¹⁰	2001	1,941.3	1,911.4 ¹¹	98.5

Notes

1. There were 454 successes and a 93.4 percent success rate without librarian assistance increasing to 480 and a 98.8 percent success rate with librarian assistance.
2. Ajlan reported 374, but analysis of the raw data and reported percentages indicates 377 is the correct number.
3. Journal articles.
4. Data includes a built-in correction factor for the 31 cases where it was impossible to determine the cause of unavailability.
5. There were 775 successes and a 96.9 percent success rate without librarian assistance increasing to 789 and a 98.6 percent success rate with librarian assistance.
6. Includes books, reserve items, and serial articles.
7. Data includes a built-in correction factor for the 4 cases where it was impossible to determine the cause of unavailability.
8. Calculated by the author from Jacobs' raw data.
9. Calculated by the author from Jacobs' raw data.
10. Journal articles.
11. Data includes a built-in correction factor for 50 failures due to bibliographic error, bad citations, or undetermined reasons.

Appendix E. Availability Rates in Kantor's Circulation Branch

Authors	Pub. Year	Number of Searches	Successes	Percent Available
Abduljalil, Cleveland Heights	1985	365	346	94.8
Abduljalil, Shaker Heights	1985	375	359	95.7
Ajlan, King Saud U.	1985	377	343 ¹	91.0
Ajlan, Petroleum and Minerals U.	1985	430	336	78.1
Kolner and Welch, Illinois-Chicago	1985	711.5	596.5	83.8
Kolner and Welch, Illinois-Peoria	1985	56	44.33	79.2
Kolner and Welch, Illinois-Rockford	1985	55	47	85.5
Ferl and Robinson	1986	346	284	82.1
Ciliberti et al.	1987	170	155	91.2
Revill	1987	1,347.5	1,187	88.1
Revill	1988	Not Reported	Not Reported	91
Bachmann-Derthick and Spurlock ²	1989	355.6	343.9 ³	96.7
Roberts ⁴	1989	202	197	97.5
Rashid	1990	775 ⁵	692 ⁶	89.3
Boekhorst	1992	488	323	66.2
Harris and Garner	1992	433 ⁷	342	79.0
Lieshout	1992	272.3	229.8	84.4
Rehman and Bashir	1993	249.4	229 ⁸	91.8
Salter	1993	117 ⁹	102	87.2 ¹⁰
Chaudhry and Ashoor	1994	555 ¹¹	493	88.8 ¹²
Mitchell, Radford, and Hegg	1994	54	53	98.1
Rehman, Arif, and Chaudhry	1994	375	309	82.4
Jacobs, spring 1994 survey	1995	3,881 ¹³	3,260	84.0
Jacobs, fall 1994 survey	1995	1,517 ¹⁴	1,341	88.4
Ciliberti et al.	1998	158	139	88.0
Ciliberti et al., journal articles	1998	77	77	100.0
Urs and Dominic, Anna U.	1999	1,195 ¹⁵	1,049	87.8 ¹⁶
Urs and Dominic, Bharathiar U.	1999	660	550	83.3
Urs and Dominic, Bharathidasan U.	1999	751	616	82.0
Urs and Dominic, Tamilnadu U.	1999	1,078	962	89.2
Shaw-Kokot and Varre ¹⁷	2001	1,911.4	1894.2 ¹⁸	99.1

Notes

1. Ajlan reported 340 successes in 374 searches, but analysis of the raw data and reported percentages indicates the correct figures are 343 successes in 377 searches.
2. Journal articles.
3. Data includes a built-in correction factor for the 31 cases where it was impossible to determine the cause of unavailability.
4. Journal articles.
5. 775 attempts without librarian assistance, 789 with librarian assistance.
6. There were 692 successes and a 89.3 percent success rate without librarian assistance increasing to 706 and a 89.5 percent success rate with librarian assistance.
7. Includes books, reserve items, and serial articles.
8. Data includes a built-in correction factor for the 4 cases where it was impossible to determine the cause of unavailability.
9. Based on the one day for which complete data was presented of a five-day study.
10. Calculated by the author from Salter's raw data.
11. Includes books and journal articles. Number calculated by author from Chaudhry and Ashoor's raw data.
12. This percentage calculated by the author from Chaudhry and Ashoor's raw data, who erroneously reported 87.4 percent as a result of applying Kantor's branches in reverse order.
13. Calculated by the author from Jacobs' raw data. Jacobs also included items "on order" and declared missing in this branch.
14. Calculated by the author from Jacobs' raw data. Jacobs also included items "on order" and declared missing in this branch.
15. Corrected number calculated by author from raw data of Urs and Dominic.
16. Urs and Dominic reported 87 percent.
17. Journal articles.
18. Data includes a built-in correction factor for 50 failures due to bibliographic error, bad citations, or undetermined reasons.

Appendix F. Availability Rates in Kantor's Library Operations Branch

Authors	Pub. Year	Number of Searches	Successes	Percent Available
Abduljalil, Cleveland Heights	1985	346	243	70.2
Abduljalil, Shaker Heights	1985	359	268	74.7
Ajlan, King Saud U.	1985	343 ¹	315	91.8
Ajlan, Petroleum and Minerals U.	1985	336	286	85.1
Kolner and Welch, Illinois-Chicago	1985	596.5	491.5	82.4
Kolner and Welch, Illinois-Peoria	1985	44.33	37	83.5
Kolner and Welch, Illinois-Rockford	1985	47	46	97.9
Ferl and Robinson	1986	284	259	91.2
Ciliberti et al.	1987	155	115	74.2
Revill	1987	1,187	1,122.5	94.6
Revill	1988	Not Reported	Not Reported	97
Bachmann-Derthick and Spurlock ²	1989	343.9	297.1 ³	86.4
Roberts ⁴	1989	197	183	92.9
Rashid	1990	692 ⁵	643 ⁶	92.9
Boekhorst	1992	323	315	97.5
Harris and Garner	1992	342 ⁷	283	82.7
Lieshout	1992	229.8	227.3	98.9
Rehman and Bashir	1993	229	150.5 ⁸	65.7
Salter	1993	102 ⁹	92	90.2 ¹⁰
Chaudhry and Ashoor	1994	493 ¹¹	438	88.8 ¹²
Mitchell, Radford, Hegg	1994	53	46	86.8
Rehman, Arif, and Chaudhry	1994	309	300	97.1
Jacobs, spring 1994 survey	1995	3,260 ¹³	2,939	90.2 ¹⁴
Jacobs, fall 1994 survey	1995	1,341 ¹⁵	1,257	93.7 ¹⁶
Ciliberti et al.	1998	139	127	91.4
Ciliberti et al., journal articles	1998	67	57	85.1
Urs and Dominic, Anna U.	1999	1,049	956	91.1
Urs and Dominic, Bharathiar U.	1999	550	511	92.9
Urs and Dominic, Bharathidasan U.	1999	616	594	96.4
Urs and Dominic, Tamilnadu U.	1999	962	865	89.9 ¹⁷
Shaw-Kokot and Varre ¹⁸	2001	1,894.2	1,721.7 ¹⁹	90.9

Notes

1. Ajlan reported 315 successes in 340 searches, but analysis of the raw data and reported percentages indicates the correct figures are 315 successes in 343 searches.
2. Journal articles.
3. Data includes a built-in correction factor for the 31 cases where it was impossible to determine the cause of unavailability.
4. Journal articles.
5. 692 attempts without librarian assistance, 706 with assistance.
6. There were 643 successes and a 92.9 percent success rate without librarian assistance increasing to 657 and a 93.1 percent success rate with librarian assistance.
7. Includes books, reserve items, and serial articles.
8. Data includes a built-in correction factor for the four cases where it was impossible to determine the cause of unavailability.
9. Based on the one day for which complete data was presented of a five-day study.
10. Calculated by the author from Salter's raw data.
11. Includes books and journal articles. Number calculated by author from Chaudhry and Ashoor's raw data.
12. This percentage calculated by the author from Chaudhry and Ashoor's raw data, who erroneously reported 89.9 percent as a result of applying Kantor's branches in reverse order.
13. Calculated by the author from Jacobs' raw data. Jacobs created separate branches for "mislaidd," temporarily absent," and "slightly misfiled."
14. Calculated by the author from Jacobs' raw data.
15. Calculated by the author from Jacobs' raw data. Jacobs created separate branches for "mislaidd," temporarily absent," and "slightly misfiled."
16. Calculated by the author from Jacobs' raw data.
17. Urs and Dominic reported 89 percent.
18. Journal articles.
19. Data includes a built-in correction factor for 50 failures due to bibliographic error, bad citations, or undetermined reasons.

Appendix G. Availability Rates in Kantor's User Branch as Defined and Reported by Original Investigators

Authors	Pub. Year	Number of Searches	Successes	Percent Available
Wood, Bremer, and Saraidaridis	1980	144.5	132	91.3
Kuraim	1983	291 ¹	262 ²	90.0
Abduljalil, Cleveland Heights	1985	243	203	83.5
Abduljalil, Shaker Heights	1985	268	236	88.1
Ajlan, King Saud U.	1985	315	265	84.1
Ajlan, Petroleum and Minerals U.	1985	286	268	93.7
Kolner and Welch, Illinois-Chicago	1985	491.5	447	90.9
Kolner and Welch, Illinois-Peoria	1985	37	35	94.6
Kolner and Welch, Illinois-Rockford	1985	46	44	95.7
Ferl and Robinson	1986	259	250	96.5
Ciliberti et al.	1987	115	107	93.0
Revill	1987	1,122.5	1,003	89.4
Revill	1988	Not Reported	Not Reported	92
Bachmann-Derthick and Spurlock ³	1989	297.1	269 ⁴	90.5
Roberts ⁵	1989	183	162	88.5
Rashid	1990	643 ⁶	596 ⁷	92.7
Boekhorst	1992	315	254	80.6 ⁸
Harris and Garner	1992	283 ⁹	259	91.5
Rehman and Bashir	1993	150.5	124 ¹⁰	82.4
Salter	1993	92 ¹¹	86	93.5 ¹²
Chaudhry and Ashoor	1994	438 ¹³	381	87.0 ¹⁴
Mitchell, Radford, and Hegg ¹⁵	1994	46	40	87.0
Rehman, Arif, and Chaudhry	1994	300	233	77.7
Jacobs, spring 1994 survey	1995	2,939 ¹⁶	2,566	87.3
Jacobs, fall 1994 survey	1995	1,257 ¹⁷	1,136	90.4
Ciliberti et al. ¹⁸	1998	127	119	93.7
Ciliberti et al., journal articles ¹⁹	1998	77	68	88.3
Urs and Dominic, Anna U.	1999	956	855	89.4
Urs and Dominic, Bharathiar U.	1999	511	460	90.0
Urs and Dominic, Bharathidasan U.	1999	594	544	91.6 ²⁰
Urs and Dominic 1999, Tamilnadu U.	1999	865	766	88.6 ²¹
Shaw-Kokot and Varre ²²	2001	1,721.7	1,663 ²³	96.6

Notes

1. 291 without librarian assistance, 311 with assistance.
2. There were 262 successes and a 90.0 percent success rate without librarian assistance increasing to 304 and a 97.7 percent success rate with librarian assistance.
3. Journal articles.
4. Data includes a built-in correction factor for the 31 cases where it was impossible to determine the cause of unavailability.
5. Journal articles.
6. 643 attempts without librarian assistance; 657 with assistance.
7. There were 596 successes and a 92.7 percent success rate without librarian assistance increasing to 657 and a 96.7 percent success rate with librarian assistance.
8. Calculated by author from the original researcher's raw data, who reported 86.2 percent.
9. Includes books, reserve items, and serial articles.
10. Data includes a built-in correction factor for the four cases where it was impossible to determine the cause of unavailability.
11. Based on the one day for which complete data was presented of a five-day study.
12. Calculated by the author from Salter's raw data.
13. Includes books and journal articles. Number calculated by author from Chaudhry and Ashoor's raw data.
14. This percentage calculated by the author from Chaudhry and Ashoor's raw data, who erroneously reported 90.6 percent as a result of applying Kantor's branches in reverse order.
15. The term "retrieval" was used for the user at the shelf branch.
16. Calculated by the author from Jacobs' raw data.
17. Calculated by the author from Jacobs' raw data.
18. Used term "retrieval" for this branch.
19. Used term "patron retrieval" for this branch.
20. Urs and Dominic reported 91 percent.
21. Urs and Dominic reported 88 percent.
22. Journal articles.
23. Data includes a built-in correction factor for 50 failures due to bibliographic error, bad citations, or undetermined reasons.

Appendix H. Analysis of Failures in Kantor's Branches (All User Failures Combined)

(The percentage of total failures in the study attributed to each branch is indicated in parentheses)

Authors	Pub. Year	Acquisitions	Circulation	Library	User	Total
Wood, Bremer, and Saraidaridis	1980	63 (28.9%)	¹		34.8 (16.0%)	218
Kuraim	1983	14 (5.9%)	²		61 (25.6%)	238
Tamura and Sakai	1983	5 (35.7%) ³	³			14
Abduljalil, Cleveland Heights	1985	43 (18.8%)	19 (8.3%)	103 (45.0%)	64 (27.9%)	229
Abduljalil, Shaker Heights	1985	39 (19.9%)	16 (8.2%)	91 (46.4%)	50 (25.5%)	196
Ajlan, King Saud U.	1985	77 (32.8%)	34 (14.5%)	28 (11.9%)	96(40.9%)	235
Ajlan, Petroleum and Minerals U.	1985	26 (11.2%)	94 (40.5%)	50 (21.6%)	62(26.7%)	232
Kolner and Welch, Illinois-Chicago	1985	48.5 (15.5%)	115 (36.7%)	105 (33.5%)	44.5(14.2%)	313
Kolner and Welch, Illinois-Peoria	1985	9 (30.0%)	11.67 (38.9%)	7.33 (24.4%)	2 (6.7%)	30
Kolner and Welch, Illinois-Rockford	1985	5 (31.3%)	8 (50.0%)	1 (6.25%)	2(12.5%)	16
Ferl and Robinson	1986	40 (25.3%)	62 (39.2%)	25 (15.8%)	31 (19.6%)	158
Ciliberti et al.	1987	21 (20.2%)	15 (14.4%)	40 (38.5%)	28 (26.9%)	104
Revill	1987	110.5 (24.3%)	160.5 (35.3%)	64.5 (14.2%)	119.5 (26.3%)	455
Bachmann-Derthick and Spurlock	1989	71.4 (33.4%)	11.7 (5.5%)	46.8 (21.9%)	84.3 (39.4%)	214 ⁴
Roberts	1989	95 (70.4%)	5 (3.7%)	14 (10.4%)	21 (15.6%)	135
Rashid	1990	149 ⁵ (36.9%)	83 (20.5%)	49 (12.1%)	123 (30.4%)	404
Boekhorst	1992	238 (47.9%) ⁶	165 (33.2%)	8 (1.6%)	86 (17.3%)	497
Harris and Garner	1992	111 (33.6%)	91 (27.6%)	59 (17.9%)	69 (20.9%)	330
Lieshout	1992	107.5 (61.9%)	42.5 (24.5%)	2.5 (1.4%)	21.2 (12.2%)	173.7
Rehman and Bashir	1993	49 (27.8%)	20.4 (11.6%)	78.5 (44.6%)	27.5 (15.6%)	176 ⁷
Salter	1993	7 (18.4%)	15 (39.5%)	10 (26.3%)	6 (15.8%)	38
Chaudhry and Ashoor	1994	51 (22.6%)	62 (27.4%)	55 (24.3%)	57 (25.2%)	226 ⁸
Mitchell, Radford, and Hegg	1994	4 (19.0%)	1 (4.8%)	7 (33.3%)	9 (42.9%)	21
Rehman, Arif, and Chaudhry	1994	51 (24.5%)	66 (31.7%)	9 (4.3%)	82 (39.4%)	208
Jacobs, spring 1994 survey	1995	117 (7.6%)	621 (40.4%)	321 (20.9%)	478 (31.1%)	1,537
Jacobs, fall 1994 survey	1995	⁹	176 (39.2%)	84 (18.7%)	133 (29.6%)	449
Ciliberti et al.	1998	20 (26.3%)	19 (25.0%)	12 (15.8%)	25 (32.9%)	76
Ciliberti et al., Journal articles	1998	43 (61.4%)	0 (0%)	10 (14.3%)	16 (22.9%)	70 ¹⁰
Urs and Dominic, Anna U.	1999	59 (14.8%)	146 (36.6%)	93 (23.3%)	101 (25.3%)	399
Urs and Dominic, Bharathiar U.	1999	210 (51.2%)	110 (26.8%)	39 (9.5%)	51 (12.4%)	410
Urs and Dominic, Bharathidasan U.	1999	206 (49.9%)	135 (32.7%)	22 (5.3%)	50 (12.1%)	413
Urs and Dominic, Tamilnadu U.	1999	72 (18.8%)	116 (30.2%)	97 (25.3%)	99 (25.8%)	384
Shaw-Kokot and Varre	2001	116 (29.5%)	17.2 (4.4%)	172.5 (43.9%)	88.6 (22.5%)	393 ¹¹
Total Number		2,277.9	2,437.97	1,704.13	2,222.4	8991.7¹²
Total Percentage		25.3%	27.1%	19.0%	24.7%	

Notes

- Circulation and library operations were combined into a single branch accounting for 120.2 failures, 55.1 percent of total.
- Circulation and library operations were combined into a single branch accounting for 163 failures, 68.5 percent of total.
- Circulation, library operations, and the user were combined into a single branch accounting for 9 failures, 64.3 percent of the total.
- This row adds to 214.2 due to the correction factor used by Bachmann-Derthick and Spurlock, but the actual number of failed searches was 214.
- Total for collection development and acquisitions branches combined.
- Includes titles received but not cataloged, which Boekhorst used as a separate branch.
- This row adds to 175.4 due to the correction factor used by Rehman and Bashir, but the actual number of failed searches was 176.
- This row adds to 225 because the cause of 1 unsuccessful search could not be determined, but the actual number of failed searches was 226.
- The bibliographic and acquisitions branches were combined, accounting for 56 failures, 12.5 percent of the total.
- The row adds to 69 because 1 failure at a "library retrieval" branch is included in this total.
- This row adds to 394.3 due to the correction factor used by Shaw-Kokot and Varre, but the actual number of failed searches was 393.
- There were 8,991.7 failures, including 350.2 (3.9 percent of total failures) that could not be directly attributed to one of the four main branches (usually due to combining branches).

Appendix I. Availability Rates in Simulated Studies Not Involving Actual Patrons

Authors	Pub. Yr	Library	Number of Searches	Successes	Percent Available
Kuraim	1983	Cleveland Heights-University Heights Main Public Library	500 ¹	65	13.0
Kuraim	1983	Cleveland Heights-University Heights Main Public Library	500 ²	321	64.2
Stelk and Lancaster	1990	University of Illinois, Undergrad. Library	450 ³	360	80.0
Stelk and Lancaster	1990	University of Illinois, Undergrad. Library	450 ⁴	316	70.2
Steynberg and Rossouw	1993	University of Cape Town, South Africa	307 ⁵	213	69.4
Chaudhry and Ashoor	1994	King Fahd University of Petroleum and Minerals, Saudi Arabia	300 ⁶	138	46.0
Chaudhry and Ashoor	1994	King Fahd University of Petroleum and Minerals, Saudi Arabia	300 ⁷	252	84.0
Chandler	1998	Cameron Village Regional Library ⁸	508 ⁹	345	67.9

Notes

1. Sample from the last five volumes of the *American Book Publishing Record*.
2. A shelf list sample.
3. A shelf list sample.
4. A sample of items previously charged out.
5. Citations to journal articles published by South African biomedical researchers.
6. 200 books from *Scientific and Technical Books* and 100 serials from *Magazines for Libraries*.
7. A shelf list sample.
8. In the Wake County Public Library system in North Carolina.
9. A sample of recently circulating materials.

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The Challenges of Change

A Review of Cataloging and Classification Literature, 2003–2004

By Shawne D. Miksa

This paper reviews the enormous changes in cataloging and classification reflected in the literature of 2003 and 2004, and discusses major themes and issues. Traditional cataloging and classification tools have been revamped and new resources have emerged. Most notable themes are: the continuing influence of the Functional Requirements for Bibliographic Control (FRBR); the struggle to understand the ever-broadening concept of an “information entity”; steady developments in metadata-encoding standards; and the globalization of information systems, including multilingual challenges.

The overarching theme of cataloging and classification literature from 2003 and 2004 is one of change. A strong influence on this theme is the *Functional Requirements for Bibliographic Records* (FRBR), and the challenge of the digital environment and the international landscape of standards and processes. Specific change agents include reconceptualizing both what constitutes an “information entity” (IE) and how these IEs are represented within and by information systems, revising the standards and principles that form the core of the cataloging enterprise, and increasing globalization of systems and the ability to allow for multicultural representations of IEs. Exacerbating these changes is the persistence of obstacles (such as updating descriptive cataloging rules to include the new IEs, providing adequate quality control within bibliographic databases, and coping with constantly changing technologies) that have challenged cataloging and classification for decades. Furthermore, there is the new pressure, both within library and information science and externally, to call ourselves something other than catalogers.

Research Method

This review of the literature of 2003 and 2004 is not complete, but every attempt was made to include a significant portion of formerly published works as well as some informal works that might be considered as grey literature. Identification of the works started with the most common cataloging and classification journals. In addition to mining the author’s own collection of literature, online databases were used to identify journal articles, books, or electronic resources that fell within the subject area, and either a print or electronic copy of those works were

obtained. A bibliographic software program was used to compile the final list of 323 published items. In addition to providing abstracts for each work, subject descriptors were assigned and used as one device for sorting the collection into subcategories. Finally, major themes were identified within the collection of literature and used as a basis for constructing the review. Many works in the list are not represented in this review either because they were outside of the major identified themes or were deemed too peripheral to justify inclusion. In most cases, the decision to exclude a work was not intended as a judgment on the value of the content, but rather a matter of selectivity based on the need to write a readable article. In a few cases, the author relied on her professional opinion to determine the relevance of some works. Alternatively, something may simply have been overlooked. Reviewed works range from conference proceedings, books, and other monographs to print- and electronic-journal articles and electronic resources, in general. The broad categories into which the works are placed provide some measure of orientation, but may fail to fully represent works that span several categories.

FRBRization—The Influence of FRBR

Introduced in 1998, FRBR is now settling down into the minds of information organizers everywhere. The traditional catalog is dependant upon redundancy of information within the record and traditional processes of quality control. FRBR is intended to reduce the redundancy and bring together more efficiently records that describe one entity, both for the benefit of the user and the cataloger. Numerous articles have addressed how to implement FRBR, described case studies of the FRBR implementation, and speculated on future concerns and issues associated with the impact of FRBR. This section highlights some of the many articles that have been published and touches on the major themes emphasized by the authors.

Bibliographic Principles and General Works

The first International Federation of Library Association (IFLA) Meeting of Experts on an International Cataloging Code was held in Germany at the IFLA 2003 annual conference. This meeting of experts resulted in the “Statement of International Cataloging Principles,” a re-envisioning of the “Paris Principles” established in 1961 at the *International Conference on Cataloging Principles* in Paris, France.¹ This new statement is now commonly referred to as the “Berlin Principles” and incorporates the new conceptual models detailed in FRBR and *Functional Requirements and Numbering for Authority Records* (FRANAR).² Comparing the two principles side by side reveals the change in direc-

tion and terminology. The 2003 version takes a broader look at information entities within the context of information systems and user searching needs by incorporating the FRBR conceptual model and the four user tasks of finding, identifying, selecting, acquiring or obtaining.³ Svenonius had suggested adding *navigation* as a fifth task in 2000.⁴ To the delight of catalogers worldwide, the draft addresses the range of information resources found in the current information environment and seeks to broaden the discussion to include all aspects of bibliographic and authority records. The Berlin Principles represents the renewal of an effort to bring standardization to information systems worldwide.⁵

Storey gives a brief overview of experiments from 2001 designed to examine the implications of FRBR and the practical difficulties in implementing its approach; He states that implementing FRBR may not be as cumbersome as first thought and could potentially “reduce the cost and increase the quality of both original and copy cataloging.”⁶ Statistical estimates on impact are provided based on the results of a test of the conversion tool on 1,000 WorldCat records. Because a manual changeover of databases to the FRBR model would be too costly, OCLC is offering a free algorithm to any organization interested in converting their records to the model.⁷ Tillett, as well, gives an overview of FRBR, emphasizing in particular the impact it will have on cataloging rules and bibliographic structures.⁸

Taniguchi has investigated creating MARC records from preexisting records based on the conceptual model given in FRBR (i.e., taking what FRBR defines as “the key objects of interest to users of bibliographic data”) in which the “expression-level” entity is given primacy.⁹ He compares FRBR with different conceptual models in order to examine differences in modeling component parts of bibliographic resources and to clarify if entities at the component level can operate in the same way as entities at the integral unit level.¹⁰ His work on developing a conceptual model of the cataloging process, which has never been attempted, has been in response to the focus on the user’s needs in the model outlined in FRBR.¹¹

Antelman investigates “work identifiers” for serials because she believes that less attention has been paid to the development of a conception of a serial work.¹² She states that “mechanisms that control the work of monographs—the main entry heading and uniform title—are weak identifiers for serials” and that a higher level of abstraction is needed, such as the abstract layers “work and expression” within the FRBR model.¹³ Antelman gives an example of a serial work within the FRBR model in which she creates different expressions of a journal by using an aggregator-neutral record outlined by the Cooperative Online Serials (CONSER) program. Potentially, the user would see “the work once and display relationships between manifestations as well as associated holdings and other qualitative attri-

butes.”¹⁴ Antelman’s exploration of different models and the Notes at the end of her article are a good source for further reading.

Other articles explore the concept of a “work” in online databases such as WorldCat, the concept of a “record,” and the need to develop the FRBR model within the context of an actual library catalog system in order to see how the record itself would be restructured.¹⁵ However, there are still issues with the current cataloging practice that need to be addressed. For example, Guerrini explores the history, scope, and functional role of the General Material Designation (GMD), and the need for a sound definition of a “mode of expression” as it relates to the use of GMD in bibliographic records.¹⁶ Oliver reports on the long-standing issue of format variations, and states that the work of the JSC Format Variation Working Group has been influenced by the FRBR model and is linked to the format variation problem.¹⁷

Riva addresses the issue of how user record retrieval is affected by taking on the bidirectional mapping of MARC 21 linking entry fields to the FRBR and Tillett/Smiraglia theoretical breakdowns of bibliographic relationships.¹⁸ The mapping demonstrates that “all linking fields are not alike, and that users may not be well served by functionality that retrieves a complete set of linked records in an entirely undifferentiated fashion.”¹⁹ At the same time, there is enthusiasm about the possibilities hinted at by FRBR. Chapman and Danskin view FRBR as a way to “overthrow the tyranny of the catalogue card by creating a new paradigm in which the strengths of information technology to access and link data are exploited rather than constrained.”²⁰ However, the authors caution that there is not yet sufficient data of FRBR’s efficiency.

Lastly, the Association for Library Collections and Technical Services (ALCTS) division of the American Library Association (ALA) sponsored numerous presentations at the 2003 and 2004 Annual Conferences that focused on topics such as FRBR in general and, more narrowly, FRBR’s application to continuing resources (*AACR2*, chapter 12), subject references, metadata harvesting, preservation, approval plans, implementation and documentation of UNICODE for catalog access, serials standards, and e-books.²¹

Projects and Case Studies

With the efficiency and effectiveness of FRBR still in question, the next natural step was to test its data model. Hegna and Murtooma set out to analyze a MARC record in order to answer two important questions—whether one can find the FRBR structure in the existing MARC records and, if

so, how one can use this structure in the catalog’s user interface.²² The answer they found to the first question was both “yes” and “no,” especially when looking at only one record. Examining a set of MARC records produced roughly the same results—some structure was found, but it was not entirely matched to the FRBR model. Attempts to exploit the structure for a user interface met with some success, but the authors found that certain characteristics of the MARC fields (e.g., function in the 700 field, how original titles are entered, language codes) interfered with how the information was displayed to the user.

Another case study revolved around the Australian Literature Gateway (AustLit), a resource service for writers and writing, in which the FRBR model was augmented with event modeling.²³ This project also incorporated the concept of a “SuperWork”—a combination of variations of a work that may be in different embodiments (e.g., a book as well as an opera). Event modeling allowed for expanding three of the four FRBR concepts—work, expression, manifestation:

- works have a *creation* event;
- expressions have a *realization* event; and
- manifestations have an *embodiment* event.

Ayres and company describe in detail the stages and outcomes of the project and demonstrate that it was possible to “implement the model and many of the extensions which FRBR commentators have suggested . . . to reorient and retrain professional staff within the system, and to develop a user interface which hides the complexities of the model, while presenting meaningful context information to users.”²⁴

Chen and Chen present a case study of the National Palace Museum (NPM) in Taipei in which the FRBR model is used to identify the proper organization of metadata elements and their distribution over FRBR entities within a more media-centric and association-rich contents.²⁵ Because this is a museum, two different metadata strands are needed. First, researchers need intellectual content without necessarily specifying various formats. Alternatively, managers need format information for management responsibilities. One of the initial findings Chen and Chen discovered was that the application of the model was beneficial because it resulted in a “distribution of metadata elements that focuses on intellectual content” as the “work and expression are two focal entities of the metadata requirements and proves to be especially suited for projects dealing with the research of Chinese paintings and calligraphy.”²⁶ The complete results are covered in this report, as well as reviews of other FRBR projects and their outcomes.

Metadata Encoding Standards: Their Evolution and Relationship to MARC

At the 2004 annual IFLA conference, the Cataloging Coordinating Board sponsored a session on “Developments in Cataloging Guidelines,” at which the Berlin Principles drafted the previous year were discussed. Howarth reported on the work of the IFLA Cataloging Section Working Group on the Use of Metadata Schemas and the responses received on the three objectives that formed the Working Group’s terms of reference.²⁷

Howarth ended this presentation by asking about what core records for resource discovery should contain and how that data should be created, derived, or exchanged. She posited that when “satisfactorily addressed, then issues related to standards development and maintenance, to automatic extraction [and] . . . generation of appropriate metadata, and to cross-schema interchange (crosswalks; interoperability) will have a proper context, some common ground, and an obvious *raison d’être*.”²⁸ This paper exemplifies the issues facing the cataloging and classification community, which finds itself challenged by an increasing array of questions pertaining to metadata interoperability and crosswalks.

The XML and MARC Debate

Abrams views Extensible Markup Language (XML) as the “centerpiece of most developers’ bets on the future.”²⁹ In his short piece for the “Information Trends” column in *Information Outlook*, he outlines new technologies that may be helpful to the future of organization of recorded knowledge. XML, he writes, “allows us to tag information beyond traditional fielding but without the hard edge of avoiding delivery or user context.”³⁰ In particular, XML would enable more user-centric coding by allowing organizers to set display variables based on a user’s skill level, by sensing the user’s device in order to adapt to their context, and by sharing content-tagging definitions across types of systems. McCallum, who points out that XML is grounded in work of at least twenty years—starting with the ISO standard for the Standard Generalized Markup Language (SGML)—discusses the Metadata Object Description Schema (MODS).³¹ This schema is a derivative of MARC 21 specifically designed to let catalogers take advantage of MARC21 within an XML environment.

Andresen contends that XML-encoded library data are a mainstream technology, and that XML is more in line with FRBR concepts and as such “related works can be linked (on the basis of the FRBR concept) and relationships presented in a logical way to the user.”³³ MARC, oriented toward the 1961 Paris Principles, focuses on the description of individual documents making it “difficult to handle relations between data that are described in different fields.”³⁴

Andresen’s comparison of MARC with XML, as well as with the Danish MARC format *danMarc2*, raises the question of how to create descriptions with several layers, which can be used in various contexts and still have minimum data duplication. Similarly, Tennant proposes a new metadata infrastructure in which XML is the most reasonable solution as a transfer schema.³⁵ He reports on the efforts of OCLC and Research Library Group (RLG) to change their respective bibliographic databases into XML-based systems. OCLC’s WorldCat database now has an “internal XML metadata schema devised by OCLC to accept nearly any type of metadata.”³⁶ Wusteman, on the other hand, warns of complicated patent-related issues, linked to companies such as Microsoft, that may result in millions of unreadable documents.³⁷ She cautions that archiving documents in formats encumbered by patents will always be a bad idea.

Carvalho et al. look at meta-information, the information about the standard that they view as central for the validation of bibliographic records.³⁸ A MetaMARC Schema is proposed using an XML framework, with the idea that it will lower implementation costs, facilitate the standard use of XML in bibliographic records, and “extend the authoritative function and reach of the documentation produced by the MARC standard agencies.”³⁹

The Library of Congress (LC) has begun developing an XML environment for working with MARC data that will allow for specific uses of the data. Design considerations such as flexibility, loss-less conversion of MARC to XML, “Roundtripability” from XML back to MARC, editing, validation, and extensibility are among the issues being discussed.⁴⁰ Version 1.1 of the schema and an illustration of it can be found on the LC MARC Web site.⁴¹ That architecture, and specific uses and features of the schema are illustrated and discussed, and examples are provided.

The LC Web site also has a Java-based MARCXML Toolkit that allows for conversion between XML and MARC file formats.⁴² Keith’s overview of the schema architecture includes a tutorial as well as a discussion about different applications and tools of the Toolkit.⁴³ This overview is intended to standardize an approach to MARC metadata in XML and to provoke thought on additional uses of that architecture.

The call for increased focus on XML also appears in several books. Miller and Clarke’s *Putting XML to Work in the Library* offers tools for incorporating XML within traditional information organization and control activities.⁴⁴ The authors stress the importance of XML to information management in libraries with the hope of spurring the construction of more flexible and sophisticated systems. The text contains simple tools and explanations for a variety of XML uses. Caplan also touches upon XML within the broader arena of metadata applications in her 2003 *Metadata Fundamentals for All Librarians* as does Haynes

in his 2004 book *Metadata for Information Management and Retrieval*.⁴⁵ Many of the articles previously discussed come from two special issues of *Library-Hi Tech*, which address case studies, experiments, and opinions on the MARC format and, as a whole, approach the question of whether or not MARC will still be viable in the future.⁴⁶

The MARC standard has been the subject of intense speculation over the past few years. Many papers discuss it in terms of advancements in its use for the control of new electronic resources; some compare it (as shown above) with other encoding standards and methods, while others discuss it in terms of its possible demise. Gorman calls MARC a historic achievement that made universal bibliographic control possible.⁴⁷ He reminds us that:

It should be unnecessary to point out that MARC is merely a framework standard—that is, it is a way of storing and making data capable of manipulation that has been formulated in accordance with content standards (cataloguing codes and the like). I would not trouble to point that out were it not for the frequent references to “MARC cataloguing” in writings about metadata and “simplified” cataloguing. There is, of course, no such thing as “MARC cataloguing”—MARC is the way we encode the results of the cataloguing process and has little or no influence on that process.⁴⁸

However, some authors believe MARC is truly inflexible and that the cataloging community should not focus on what could have been done with it under different circumstances.⁴⁹ Tennant sees sole reliance on MARC—despite the millions of resources cataloged using non-MARC encoding—as detrimental, and warns us to “ignore these [non-MARC] resources at our peril.”⁵⁰ Some take a more structured approach to the reliability and sustainability of MARC. Yee chooses to explore problems associated with the MARC 21 format and then place the problems into four categories—(1) problems that are not the fault of MARC, (2) problems identified that perhaps are not problems, (3) problems connected with the current shared cataloging environment, and (4) problems either caused or partially caused by MARC 21 and that could be solved in the process of migrating data to a future data-structure standard.⁵¹ Yee has closely studied the cataloging literature (her reference list is a solid source for other researchers) and identifies misperceptions about MARC made by other writers (e.g., pointing out the mistaken notion that XML is superior to MARC 21 in its degree of hierarchy) and factual errors in research (e.g., clear misunderstandings about the function of various MARC fields). She offers recommendations for resolutions of specific problems within the third and fourth categories and warns catalogers to “be careful not to destroy

what we have in a rush to emulate the rest of the world, which may be on the threshold of recognizing its own need to develop solutions similar to the ones we in the library world already employ.”⁵²

Projects and Case Studies

Several interesting studies using the MARC 21 format have been published. Carini and Shepard report on the Mount Holyoke College Archives and the Five College Finding Aids Access Project in which the format is discussed in relation to the Encoded Archival Description (EAD). The authors aim to demonstrate that greater standardization in archival description allows archivists to respond more effectively to technological change.⁵³ Davis explores standardization efforts by archivists beginning in the late 1970s, including the development of the MARC AMC format.⁵⁴ Wisser and Roper report on North Carolina State University’s implementation of EAD and discuss the commonalities between creating descriptive metadata schemas; it is enhanced by project members’ varying objectives.⁵⁵

Cyril, a program to add Russian characters to existing MARC records, has been examined for any multilingual or multiscript implications it might have for cataloging and authority-control standards.⁵⁶ The results of the study demonstrate that MARC inflexibility is actually beneficial for Cyril’s success. Similarly, the use of USMARC for cataloging mathematical and scientific curriculum materials at the Eisenhower National Clearinghouse (ENC) is examined, including issues related to cataloging interface integration.⁵⁷ Surratt and Hill report on the creation of MARC records for electronic theses and dissertations (ETD) using a Perl script to extract metadata from an ETD database and the cataloging workflow issues associated with it.⁵⁸ Jul notes the disconnect between information organization and access in libraries and nonlibrary organizations. He argues that the library community needs to provide instructions that will make metadata usable, meaningful, and retrievable, particularly when it pertains to the nonlibrary community.⁵⁹ Lastly, as an example of large numbers of projects involving metadata development, Hunter’s review of the metadata research efforts for organizing information resources on the Web demonstrates that metadata efforts are far from trivial and very valuable, despite the difficulties.⁶⁰

Cataloging Tools and Resources

AACR2

The *Anglo-American Cataloging Rules*, 2nd edition, revised (AACR2), was updated in both 2003 and 2004.⁶¹ Changes to the rules in the 2003 update included new definitions for the terms “Cartographic materials,” “Globe,” and “Map,” as

well as changes to rules in chapters 12, 21, 24, 25, and 26.⁶² The 2004 update included notable changes to chapter 9, specifically the removal of the material specific details area. This area is no longer used for electronic resources. Chapter 1, rule 1.0A “has been lengthened, including a new subrule, 1.0A3, to explain more fully the concept of ‘chief source of information.’”⁶³ In addition, catalogers can now include more flexible descriptions of the physical carriers of sound recordings (rule 6.5B1), videorecordings (rule 7.5B1), and electronic resources (rule 9.5). Catalogers have the “option to record a physical description of a remotely available electronic resource, instructing that the term used come either from an appropriate subrule .5B (from one of the chapters in AACR2 Part I) or from common usage.”⁶⁴ A list of these changes can also be found on the Joint Steering Committee for the Revision of the Anglo American Cataloguing Rules Web site.⁶⁵

General Cataloging Texts

The release of the 2002 edition of AACR2 and its subsequent updates has reverberated into new and revised general cataloging works and textbooks in 2003 and 2004. Fritz released a revised version of *Cataloging with AACR2 and MARC 21* that includes changes through to the 2004 AACR2 update.⁶⁶ This volume remains one of the more comprehensive works on the marriage between AACR2, MARC, and other tools, and is particularly useful when teaching descriptive cataloging. Fritz introduces the relationship between AACR2 and MARC before proceeding to the cataloging process as a whole, in which catalogers must learn to navigate and interpret rules to generate metadata for use in an electronic catalog record. She eloquently states that, while the manual “cannot claim to be a completely comprehensive tool,” it can show the “many patterns in the web of information that we have been trying to weave into coherence long before the days of www. This work is an attempt to reveal some of those wonderful patterns to those of us who enjoy this kind of thing.”⁶⁷ Her particular approach brings together AACR2, LC Rule Interpretations, MARC, LC Classification (LCC), Dewey Decimal Classification (DDC), OCLC, subject headings, general cataloging works, and a healthy supply of her own “Hints” to guide catalogers through the cataloging process. One last comforting aspect of this work is the author’s complete understanding of the fear an empty MARC record causes the uninitiated cataloger. Fritz and co-author Richard Fritz have also published *MARC21 for Everyone: A Practical Guide*, which focuses exclusively on MARC21 and is aimed at the beginning cataloger.⁶⁸

Another familiar handbook is *Maxwell’s Handbook for AACR2*, revised, which includes changes up through the 2003 AACR2 update. Major revisions include chapter 3, chapter 9, and chapter 12, as well as incorporating the new

concept of “integrated resources” and all significant changes of the MARC format.⁶⁹ Maxwell stresses that this edition follows “the basic premises of the first edition,” but cautions readers not to use the book as a substitute for a proper “self-help manual.”⁷⁰ Maxwell offers detailed explanations for cataloging problems, citing each rule in full and providing examples of title pages and sample MARC records for easy reference.

The release of the ninth revised edition of *Wynar’s Introduction to Cataloging and Classification* also coincided with the release of the 2002 edition of AACR2. The text, by Taylor, incorporates the 2003 AACR2 update and takes into account the change from “computer files” to “electronic resources” and the derivation of the chief source of information from Web sites, the change from “serials” to “continuing resources,” and the new concept of “integrating resources.”⁷¹ Moreover, new examples have been added, and MARC examples have been changed to reflect MARC21. Taylor also briefly discusses FRBR and its incorporation into the expected AACR3, to be renamed *Resource Description and Access (RDA)*.

A new cataloging text is Bowman’s *Essential Cataloguing*.⁷² Unlike the usual cataloging texts, such as those previously discussed, it does not devote one chapter each to the different formats as outlined in AACR2 Chapters 2–12. The author asserts that anyone who understand the principles of cataloging should be able to transfer them to all kinds of materials. Therefore, chapters are devoted to fundamentals of descriptive cataloging by covering the eight areas as outlined in the International Standard Bibliographic Description (ISBD) and AACR2 chapter 1. Subsequent chapters address access points (covering much of part II of AACR2), multipart works, headings for persons and corporate bodies, authority control, and uniform titles. Title pages are reproduced in most chapters and an appendix provides MARC records for the examples used throughout the book. Bowman also reminds his readers of the continuing need for cataloging, even though it is unpopular and “nowadays little taught,” and that computers still cannot completely replace catalogers.⁷³ He illustrates this by logically pointing out all the ways in which catalogers are needed now more than ever.

Read’s *Cataloguing Without Tears* is a general text on descriptive and subject cataloging for the beginning library and information science (LIS) professional.⁷⁴ The author divides the book into two parts: the big picture and the nitty gritty, and makes no assertion that by reading her work one would learn cataloging. Instead, she covers peripheral issues such as cataloging policies, choosing a records-management system, staffing concerns, and broadly discusses the more difficult subjects such as distinguishing among formats, dealing with unknown languages, and authority control. She states the “very best way to learn is to catalog a wide variety

of different materials with an experienced cataloger at your elbow telling you what to do next (and why)...[or] you will have to sit down with the cataloging guidelines for your organization, put an icepack on your head and try to work it out for yourself.”⁷⁵

Cartographic Cataloging Texts

Cartographic Materials: A Manual of Interpretation for AACR2, 2002 Revision, second edition, was published in 2003 after a series of revisions of corresponding works, which is described in the preface of the second edition.⁷⁶ This new edition has taken into consideration the “changes and developments in cataloging cartographic materials since the publication of the first edition” and how “the introduction of geographic information systems (GIS) and digital geospatial data has dramatically changed the field of map librarianship.”⁷⁷ An update to this newly revised classic text was released in 2004.⁷⁸

Andrew’s *Cataloging Sheet Maps: The Basics* received many favorable reviews and, like Fritz’s work, grew out of several years of workshops.⁷⁹ By focusing exclusively on sheet maps, Andrew is able to devote whole chapters to specific areas of descriptions and the corresponding encoded fields (e.g., mathematical data area, notes). The author includes what he describes as “a necessary dose of cataloger’s judgment,” believing in flexibility “within the bounds of the rules that we use, as well as in applying common sense where needed.”⁸⁰ Lastly, sections four and five of the book address subject analysis and classification using the G-schedule of LCC and historical maps and special cases.

Electronic Resources Cataloging Compilations

A compilation on cataloging of electronic serials and monographs, released in 2003, includes papers by twelve authors grouped into three areas: introductory papers that explore the larger topical area of libraries and metadata, the employment of metadata in libraries, and specific instances of libraries dealing with AACR2 and metadata standards. The intention of the book is to “explain, describe, and illustrate the brave new world libraries are creating through the use of metadata.”⁸¹ Notable authors include Gorman, Baca, Tillett, and Romano Reynolds.

Another collection includes three chapters by different authors focusing specifically on cataloging e-resources and metadata. In this updated edition of a 1998 publication, Shadle examines AACR2 rules and points out that the flaws of the cataloging code, which was developed for a different information environment, are becoming more obvious.⁸² He also examines current problems such as identifying first issues, chief sources of information, mutability, and multiple versions, and discusses some of the solutions being developed. Cole addresses the selection of the chief source of

information for electronic serials, contending that AACR2 rule revisions help with cataloging print serials, but are still ambiguous for electronic serials.⁸³ He believes CONSER documentation is more helpful on this issue. Wool addresses metadata in order to demystify metadata by demonstrating that cataloging and metadata collection are, essentially, the same.⁸⁴

Coleman’s work on the selection and cataloging of Web resources focuses on “the information research process that takes place among lower division college students . . . to help you understand educational needs, the types of information resources that can meet these needs, and how to enhance the library catalog with electronic information resources.”⁸⁵ Two unique features of this book are the manual in part II for cataloging with Dublin Core elements and education elements from IEEE Learning Object Metadata (LOM) and the worksheets in part IV to be used for “selecting resources, creating metadata, and doing a quality assurance check with a subject expert.”⁸⁶

The North American Serials Interest Group (NASIG) published the proceedings of its 2002 and 2003 annual conferences both as book compilations and simultaneously as volumes 44 and 46 of *The Serials Librarian*.⁸⁷ The 2002 conference “Transforming Serials: The Revolution Continues,” focused on cataloging e-serials. One preconference gave a detailed discussion on the specific MARC 21 tags used for cataloging electronic serials and included hands-on exercises for the audience. Other presentations addressed cataloging serials reproductions, the role of catalogers in the creation of the K-State Digital Library, cataloging for consortiums, AACR2 rule revisions of chapter 9 and chapter 12, and e-journal access at the University of Tennessee. The 2003 conference included a pre-conference on cataloging survival techniques for the non-cataloger. Session topics and workshops contained presentations on the serial work in the California Digital Library Catalog, consideration of opportunities springing from the changing role of a cataloger to an ontologist, and a case study of using MARC records for electronic resource management at Auburn University.⁸⁸

Music-Cataloging Texts

Cataloging music and sound recordings has also been addressed, most recently in the 2004 book *Cataloger’s Judgment: Music Cataloging Questions and Answers from the Music OCLC Users Group Newsletter*.⁸⁹ The content comes directly from Weitz’s “Q&A” column in the newsletter going back to 1989. The title was deliberately chosen because:

it emphasizes that real-world instances, in spite of our never-ending efforts to codify practices, will always defy those efforts. The world of stuff to catalog is so vast, so slippery, so surprising, that

individual judgment will always enter into our decisions. And it suggests that catalogers are not the mindless drudges that many non-catalogers imagine, but instead are thoughtful judges concerning matters of description and access.⁹⁰

Weitz has arranged the chapters to address major categories of questions: main and added entries, titles, description and related fields, notes, subject access, numbers, and fixed fields. Rule revisions, MARC fields, and the like are addressed as well, although Weitz cautions that, in the interest of minimizing changes to the original questions and answers, “there are countless references to outmoded technologies; superseded documentation and page numbers, old forms of headings, dead URLs; bibliographic and authority records that have long since changed; ancient rules; and obsolete practices.”⁹¹ Weitz does not use illustrations and example records, but readers can follow the discussions by accessing the OCLC records for items under question.

An interesting dissertation published in 2004 is Gardinier’s work entitled *Access Points Perceived as Useful in Searching for Music Scores and Recordings*, in which she employs a qualitative study on access-point retrieval for music scores and recordings to try to characterize the cultural environment that may affect choice of and access to these materials.⁹² This is noteworthy research because it presents information about access points from the perspective of the musician.

Major Classification Schemes and Controlled Vocabularies

The 2003 edition 22 of *DDC* “reflects current thought in knowledge organization and incorporates updates and changes identified during the life of Edition 21.”⁹³ The abridged *DDC*, 14th edition, was published the following year.⁹⁴ One interesting change in *DDC22* is the shortening of the manual notes. Additionally, the Editorial Policy Committee (EPC) has striven to take a more international stance in order to remain relevant and useful. EPC is quick to point out that *DDC22* is the first edition to be “produced in the context of the web environment,” which has enabled continuous updates and provision of those updates to its users.⁹⁵ One of the major changes to the system has been the removal of table 7 (Group of Persons). Other changes can be read in the “New Features in Edition 22” section of the first volume.⁹⁶

Mitchell and Chan have a newly updated textbook to accompany *DDC22*.⁹⁷ It covers all the important points a novice needs to learn about *DDC* by devoting chapters to the subject-analysis process, how to use the manual, relative index, practical number building, standard subdivisions, geographic issues, use of specific tables, as well as including

number building for complex subjects, a glossary, and an extensive bibliography. Each chapter includes exercises with answers provided in an appendix.

The changes to *DDC* have not entirely placated everyone in the LIS community. Kua asserts that there is still a bias in *DDC* because it is still based on a nineteenth-century North American academic environment and shows a bias no longer acceptable for libraries in the twenty-first century.⁹⁸ Kua urges national libraries to address the issue, and to investigate new models for adapting *DDC*. However, EPC contends that it does recognize the diversity of its users and has worked toward removing Christian and western bias from the classification.⁹⁹

LCC issued several revised schedules during 2003 and 2004. A quick review of the LC Cataloging Distribution Service Web site shows the following schedules were published in 2004: KB Religious Law, KF Law of the United States, PN Literature (General), PQ French, Italian, Spanish, and Portuguese Literatures, P-PZ Tables Language and Literature Tables, and Q Science.¹⁰⁰

The Universal Decimal Classification Consortium has announced that the latest edition of the *Universal Decimal Classification (UDC)* will be published in 2005. In the meantime, official changes can be read in *Extensions and Corrections to the UDC*, a serial publication from the Consortium.¹⁰¹ Revisions and proposals are given in this publication, as well as communications, and articles about the system. A reprint of Slavic’s paper from the 2003 IFLA conference addresses the implementation of synthetic classification systems, such as *UDC*, in information-retrieval systems and “summarizes the most important functionalities of the *UDC* that need to be taken into account” so as to serve as an “underlying knowledge structure that provides systematic subject organisation and thus complements the search using natural language terms.”¹⁰²

Classification in general is also addressed in another compilation of articles entitled *Knowledge Organization and Classification in International Information Retrieval*.¹⁰³ This collection of articles includes topics such as adapting classifications across languages and cultures, specificity and *UDC*, classification of international economic data, and classification and the Web.

Several of the primary tools for providing subject-heading access have been updated. Publications in 2003 and 2004 included edition 18 of *Sears Subject Headings*, editions 26 and 27 of the *Library of Congress Subject Headings*, editions 15 and 16 of the *Free-Floating Subdivisions*, and the cumulative edition 5 of the *Subject Cataloging Manual: Subject Headings* with all updates through 2004.¹⁰⁴

Broughton published a new textbook, entitled *Essential Classification*, in 2004.¹⁰⁵ The author states in her introduction that “emphasis throughout is on the activity of classification rather than the theory, the practical problems of

the organization of collections, and the needs of users.”¹⁰⁶ Unlike classification texts devoted to one particular system, this work approaches classification more broadly and examines underlying principles first before moving on to different structures and techniques for classifying. Each chapter includes examples and exercises with answers (but without explanations). A glossary and categorized bibliography are included.

Historical Works

Another compilation of works coming from articles originally published in *Cataloging & Classification Quarterly (CCQ)* in 2002 and 2003 is *Historical Aspects of Cataloging and Classification*.¹⁰⁷ The participating authors cover an extensive range of topics within a variety of international settings. Spanhoff’s analysis of the fundamental principles underlying AACR is interesting, especially in light of the newly drafted Berlin Principles as discussed earlier in this paper.¹⁰⁸ She expresses concern with the direction being taken (at the time) by the Joint Steering Committee for the Revision of AACR, which sought to revise the fundamental principles underlying AACR by using FRBR. Spanhoff writes that FRBR does not deal with catalog structures and records as defined in AACR. Her article was chosen as the best article for volume 36 of *CCQ* for her “ability to combine a historical analysis of cataloging principles with commentary on how the various theoreticians and standard-setting bodies are working on creating new principles for the online environment.”¹⁰⁹

Two additional papers of note are Bradley’s overview of music classifying and cataloging in American libraries and Guthrie’s look at the influence of medieval monastic library classification on modern schemes, in particular class B of the LCC system.¹¹⁰ The last paper in the volume is a history of “the work” in modern catalogs by Smiraglia, in which he asserts that a work is more than simply the creative activity of an individual.¹¹¹ Instead, it is the product of intellectual activity spread across time and culture. He goes on to observe that the modern catalog has failed to impose a universal order on the elusive work-phenomenon. Smiraglia’s focus on this classic concept is timely as it is one of the essential components of FRBR.

Library Classification

Several investigations focused on the effectiveness and unique uses of classification systems in a variety of information environments, as well as theoretical and historical issues surrounding the overall use of the systems.

Mai examines the future of classification as it relates to subject interoperability and the use of both general and specialized classification schemas.¹¹² In particular, he recom-

mends that “international exchange of bibliographic records and interoperability across information retrieval systems will be possible if general classification systems are used in conjunction with special indexing systems.”¹¹³ The broad organization combined with the specialized systems will allow for domain specializations that could enable users to find information more easily.

Zhao conducted an interesting study to identify problems with assigning Cutter numbers within LCC, and identifies three major problems with number assignment—Cutter numbers assigned not following the LC Cutter Table, confusion when using the Cutter Table, and problems caused by the first few letters in the first work or first word(s) of main entries being the same.¹¹⁴ Frank and Paynter investigated the automated assignment of classification numbers using LCC in the INFOMINE virtual library.¹¹⁵ In essence, they trained a “hierarchical classifier” to assign LCC numbers using approximately 850,000 records by using mappings of LC subject headings to LC classification numbers.

Araghi examines the relationship between classification and information retrieval (IR) within current information systems.¹¹⁶ He writes that they are so intertwined that they cannot be separated—but if they could be separated, it would reveal that better effort in classification and indexing results in better retrieval. In another article, he proposes a new classification system called the Universal Binary Classification (UBC) that would be used for book classification and indexing.¹¹⁷ The author conducted a comparative study with other systems such as DDC and LCC, and tested the new system with a survey in the central McGill University on the disciplines of Islam and of LIS.

Mills also examines the relationship between classification and IR, specifically faceted classification and its use within IR systems.¹¹⁸ As a long-time expert in library classification, Mills’s insight into this relationship and his review of the fundamental process of faceted classification, especially the general role of logical division, is invaluable. Using the new Bliss Classification System (BC2), he discusses the six fundamental steps taken in classifying with a faceted system, including the division of a subject into facets, facets into arrays, and citation order. Finding a journal article that provides detailed description on the process of classifying is a rarity.

Beghtol maintains that classifications for IR are called “professional” classifications because they are devised by people who have a professional interest in classification.¹¹⁹ She states that classifications for knowledge discovery are called naive classifications because they are devised by people who have no particular interest in studying classification as an end to itself. Beghtol stresses that classification for knowledge discovery has been less explored than classification for IR. She explores these two categories and discusses methods for construction of naive classification systems. In

another article, Beghtol brings attention to the subject classification system of James Duff Brown and the fact that he has not yet received the recognition for his contribution to the study of classification.¹²⁰ She suggests that “any research field is enhanced by inquiring into its intellectual history and background, both by increasing our comprehension of the past and by refining our understanding of the activities of the present.”¹²¹

Other areas of librarianship have also explored the use of classification for resource discovery. Goldberg examines historical and political aspects of the development of law classification seen in LCC’s schedule K and how it relates to the development of a universal law classification.¹²² Others examine adapting DDC for use in a feminist/women’s-issues context in an effort to demonstrate that adaptation to a particular culture or context is possible.¹²³ Campbell describes the classification of economic data by comparing the North American Industry Classification System (NAICS) and LCC.¹²⁴ In particular, he asks how a statistical classification scheme differs from a bibliographic classification scheme in its representation of different countries, and what mechanism each uses to facilitate comparison and cross-analysis of common topics in different countries.

Information Organization Education

Education in the organization of information objects, both presently and in future information environments, is a sensitive subject that is always on the frontlines. It is often the center of passionate debates, particularly now with the amount of change catalogers can expect in their tools (that is, RDA), resources, and users.

Hill, an established advocate for information organization education, gives a historical account of cataloging education in library schools in part I of a two-part article, paying particular attention to instructional delivery, the use of adjuncts to teach the courses, the substance of courses, and the decrease in library schools’ commitment to require cataloging courses.¹²⁵ Part II addresses the issue of cataloging training in the classroom versus training in the work place. Hill states there is a “yawning chasm between library-specific practice and history and principles. The chasm is called ‘Understanding and Applying Cataloging Rules and Standards,’ and is one that all catalogers must cross.”¹²⁶ She discusses advantages and disadvantages to workplace training and examines a few helpful external resources. Perhaps the most significant words Hill imparts to her readers are found in her admonishment of library schools for neglecting to provide appropriate training of up-and-coming catalogers. She writes, “One of the consequences of the evolution of the collective LIS curriculum to include proportionately less about cataloging and bibliographic control is that fewer librarians have a real understanding and appreciation of

cataloging, of all that it entails, of all that it does, and why it matters.”¹²⁷ Hill ends her discussion on cataloging education rhetorically by questioning why it is needed at all. She concludes that “education for cataloging is no more an obsolete concept than is education for librarianship.”¹²⁸ It has transformed, of course, but it has not disappeared.

Hsieh-Yee also addresses cataloging education by surveying 52 ALA-accredited LIS graduate program directors about their cataloging and metadata curricula.¹²⁹ She found an increased reliance on introductory courses to introduce essential cataloging and metadata concepts, and fewer required cataloging courses. While she found a high percentage of cataloging courses offered, there was an overall lack of consensus on exactly what the courses should cover. Cataloging educators are split on the issue of whether cataloging is metadata or if they are two different areas. She states that “most of them considered many of the topics equally relevant to students who aspire to be catalogers and those aspiring to be metadata specialists.”¹³⁰ The survey results allowed for recommendations to be made in response to Action Item 5.1 of LC’s *Bibliographic Control of Web Resources: A Library of Congress Action Plan*.¹³¹

The issue of continuing education for catalogers is just as contentious because it reveals both the failure of many library schools in teaching the basics and the failure of catalogers to keep current with their professional requirements. Moreover, failure to support continuing education often reveals the failure of library administrators to recognize the value of catalogers. For example, one can search the Autocat electronic discussion list archives and read quite a few passionate threads on the topic.¹³² CCQ has published interviews with experienced catalogers that provide a sense of the work involved, the issues addressed, and opinions of the impending changes on the horizon.¹³³

Local and International Authority Control, and Quality Control

The *International Conference on Authority Control: Definition and International Experiences* was held in Florence, Italy on February 10–12, 2003.¹³⁴ Participants gave presentations on standards and exchange formats, control of names and subjects, theoretical aspects concerning authority control and authority-control education in LIS schools, conceptual models, international systems of authority control, impediments to appropriate authority control in online catalogs, UNIMARC format for authority records, and authority work for names, works, and subjects. Igino Poggiali, then National President of the Italian Library Association, gave the opening remarks in which he commented on the outsourcing of authority work:

Whether the work is done inside the library or the task is outsourced, the real problem is the availability of a really professional staff able to face the complexity of these new challenges. The series of problems in which treatment of authority control is set requires a high cultural level of preparation of operators, and a great openness to cultures and ways of thinking that are different and remote. How many of us are really prepared at this level?¹³⁵

Many of the papers describe projects from different countries. For example, Fabian discusses the thesaurus of names, printers, publishers, and persons used by the Consortium of European Research Libraries (CERL).¹³⁶ Hu, Tam, and Lo give an overview of Asian authority control, and Messmer describes the German name-authority file in the Bavarian Union Catalogue.¹³⁷

Boese examines the cost of authority control and explains how the investment in a strong authority database can lessen future catalog maintenance costs.¹³⁸ Delsey discusses the international sharing of authority data and the proposal of the International Standard Authority Data Number (ISADN) that would establish links between multiple sources.¹³⁹ He sees a potential to support large-scale uploading of authority files to national and multinational databases through the use of automated routines, which reduce the level of human intervention needed. Graham and Ross explore authority control in the *Civil Rights in Mississippi Digital Archive* and discuss how the project has enabled Name Authority Cooperative Program (NACO) and Series Authority Cooperative Program (SACO) member libraries to add local name and subject headings, thereby allowing LC to fill in gaps in the corresponding subjects areas.¹⁴⁰

There is also the curiously ignored issue of nonroman scripts in bibliographic and authority records. Plettner gives a brief history of Arabic name authority control that centers on whether or not to use both dual-script records, Latin and Arabic, or just one script.¹⁴¹ Current technology still requires a dominant language. The implementation of nonroman script bibliographic records in the United States has eased the situation for bibliographic records, but not as much for authority records. RILIN and OCLC are leaders in implementing Arabic language authority records, but Arabic language catalogers must adhere to the input methods required by the two bibliographic institutions. Plettner points out that “since less than half the world uses Latin scripts exclusively, the inclusion of nonroman scripts in any future plans is essential. The challenge now is to implement this encoding capability in a uniformly standardized way and to encourage its adoption by all libraries.”¹⁴² She specifically sites the success of UNICODE as an international standard and also examines MARC21 and how groups such as ALA’s

Machine-Readable Bibliographic Information Committee (MARBI) are dealing with this situation and suggests that a supranational group would better serve the consensus on authority control at an international level. Plettner proposes that a model for an international name authority clearinghouse be implemented to save the time of both the cataloger and the user.

International efforts in bibliographic control can also be seen in the proceedings of the eighth conference of the International Society for Knowledge Organization (ISKO) held in London in July 2004.¹⁴³ University College London hosted the conference, entitled “Knowledge Organization and the Global Information Society.” Fifty-four papers were presented on knowledge organization topics ranging from theoretical foundations, linguistic and cultural approaches, social and sociological concepts, to user perceptions, universal and special systems of organization (e.g., UDC, DDC, analytic-synthetic classification systems), nonprint materials (e.g., electronic documents, images, medical), and applications of artificial intelligence and knowledge representations.

Finally, in keeping with the FRBRization issue, Patton reports on the IFLA Working Group on FRANAR.¹⁴⁴ Quite simply, FRBR does not address functional requirements of authority records. The aim of the working group was to define the requirements, the use, and the user, as well as a possible ISADN. This initial conceptual model depicts five “‘primitive’ entities” (being, thing, concept, event, and situation) mapped to FRBR entities as well as entities that “reflect the logical groupings of data that make up an authority file.”¹⁴⁵ Other relationships such as linking relationships and relationships between and among entities are also explored. User tasks are described in terms of resource discovery (search, identify, control, and relate) and data management (process, sort, display, and integrate.)¹⁴⁶

Beyond the issue authority work in general is the pursuit of overall quality of data in bibliographic and authority databases. Paiste’s review of the literature of quality control notes the evolving nature of quality, particularly throughout the 1980s and 1990s.¹⁴⁷ She offers ways for catalogers to maintain quality by using management expert W. Edwards Deming’s fourteen points to transform an organization (e.g., assessing user needs and expectations, strategic planning). Paiste strongly urges catalogers to keep in focus the purpose of their activities. She likens the modern quality environment to a medieval guild: “Training occurs first, there is quality at the source, and workers do not pass on known defects. Workers have a view of the whole product and take pride in their workmanship.”¹⁴⁸

Beall and Kafadar point out that the efficiency of copy cataloging can be accompanied by inefficiency due to typographical errors in those same records.¹⁴⁹ The authors noted 100 errors found within 500 records in the OCLC

WorldCat database and traced the records containing the errors back to five libraries to see if corrections had been made. They measured how successful copy catalogers were at finding and correcting typographical errors. The findings indicate that, of the 500 records examined, only 35.8 percent were corrected and 64.2 percent were uncorrected. While this is a small study, the results are still shocking enough to warrant more in-depth research of why these errors are uncorrected and how libraries can ensure better quality control of their databases. Beall and Kafadar offer several reasonable suggestions for such future studies. Kulczak and Reineka report on the measurement of the quality of headings in Government Printing Office records supplied by Marcive and found that, while the overall quality was good, a significant percentage of headings in the authority reports required additional attention.¹⁵⁰

Shin reports on an assessment of 2,000 Korean-language bibliographic records in WorldCat and considers specific errors, error frequency, areas where errors occur frequently, and errors that could inhibit record retrieval.¹⁵¹ Shin found patterns in the errors involving ISBD punctuation, missing variable and fixed fields, and that these patterns are similar to other studies. Romanization errors were also of great concern because of the resulting retrieval difficulties. Shin offers eight recommendations to enhance the quality of Korean records.

Following on the heels of his 2002 occasional paper on the misinformation in shared library catalogs, Bade published two works addressing similar issues. The first is a self-published work that examines in detail 175 records in OCLC's WorldCat database to study "failure of competence or attention in the cataloger."¹⁵² A 2004 book is a longer treatise on more theoretical issues of misinformation.¹⁵³ Here Bade divides the content into several categories—the theoretical aspects of error, theory, and practice of bibliographic failure, taxonomies of error, and misinformation and the disorders of significance. He provides a comprehensive review of comparable literature and a strong argument for self-detection, self-correction, and self-assessment within the information organization environment in any library, even though he concentrates solely on academic libraries. The taxonomy of errors in part III alone is a valuable contribution to LIS. Bade writes that "origins of errors in bibliographic databases range from purely mechanical and predictable causes, to nonpredictable errors arising from software and hardware design and operation beyond the control of the cataloger" and that his classification is intended to provoke interest and discussion.¹⁵⁴ The taxonomy is comprehensive and impossible to completely relate here, but the broader classes include such topics as policies as error engines, mechanical origins, human-computer interaction, psychological factors, methodology, linguistics origins, and subjective incompetence. The bibliography is extensive and

would enhance any LIS curriculum, particularly information organization and technical service. Bade concludes the book by asking his readers to imagine "putting 'science' back into Library Science" and reminds the reader that "constant attention to error, to identifying, correcting, and learning" from science is the life of science.¹⁵⁵ To provoke discussion or action may be the author's ultimate goal with this work, but the undertone is to use plain old common sense when it comes to quality descriptive and subject cataloging.

Lastly, MacEwan and Young examined the quality of bibliographic records at the British Library with the aim of developing a robust, accurate, and consistent methodology that can act as a reliable management information tool for reporting on the effectiveness (quality and accuracy) of the Library's cataloging service.¹⁵⁶ FRBR concepts and its user-task focus were used as a measurement for quality.

Subject Retrieval and Access, Multilingual Issues

In 2001, an IFLA satellite meeting on subject retrieval was held in Dublin, Ohio. McIlwaine remarks in the introduction of the published proceedings that "we are not indulging in anything new. We are following in very well-trodden footsteps, and the organization of information has been practiced by governments for more than two and a half millennia. The principal differences that face us today are the speed with which information is amassed and the quantities of it, together with the constant economic pressures."¹⁵⁷

Papers presented at several different sessions focused on subject retrieval and access several different sessions: retrieval in multilingual environments, retrieval across multiple vocabularies, cross-sectoral retrieval, domain-specific retrieval, retrieval tool development, and transformation of traditional tools for the Web environment. Riesthuis discusses issues surrounding a multilingual thesauri that would allow for access to information using another (natural) language than the language of the information itself, as well as the problems associated with such an effort (e.g., stretching a language to make it fit a foreign structural concept).¹⁵⁸ He stresses that cataloging and subject-indexing rules have not kept up with these developments and that subject-access tools need to be more user intuitive. Kuhr describes similar efforts of combining subject headings from multiple disciplines and their corresponding controlled vocabularies using algorithms.¹⁵⁹ Olson reports on the mapping and integration of LCSH and the National Library of Medicine's Medical Subject Headings (MeSH).¹⁶⁰ Bean and Green suggest the use of integrated structures, called frame representations, in order to standardize syntagmatic relationship types on the conceptual level and to provide higher precision in electronic retrieval of text.¹⁶¹

A major trend in subject-access work is the combining, or mapping, of traditional subject-access tools and the increasing multilingual issues worldwide. The Multilingual Access to Subjects (MACS) project is one example of this important work.¹⁶² Creider surveyed academic libraries about the use of Spanish-language subject headings, an area in which very little research has been done, and found that 48 percent of the libraries “routinely removed Spanish language subject headings already present on cataloging copy, while 58 percent left them in their records and that only 5 percent of the respondents actually added Spanish subject headings.”¹⁶³ Another important aspect of subject access often ignored is the problem of multiple interpretations of meaning by catalogers and indexers. Šauperl has developed a model of subject cataloging based on twelve catalogers that she feels will contribute empirical evidence to the theory and practice of indexing.¹⁶⁴ One conclusion reached in the development of the model was that “catalogers are in fact aware of the multiple meanings that subject headings may have for different people in different situations, and that catalogers actually try to limit those multiple meanings.”¹⁶⁵

Lastly, the Faceted Application of Subject Terminology (FAST), a simplified approach to assigning LCSHs, has been developed by adapting a “faceted schema with a simplified syntax,” while retaining the richness of LCSH.¹⁶⁶ It is a post-coordinated vocabulary system specifically intended for the Web environment and has been designed for easy use with embedded metadata and automated authority control.¹⁶⁷

Summary

The rapid changes taking place with cataloging rules, standards, and the tools and resources used by catalogers have been the focus of much of the literature during 2003 and 2004. In particular, FRBR has hit the field much like a tsunami—striking with little mercy and rearranging the landscape, rendering traditional and accepted cataloging concepts as obsolete or illogical in the twenty-first-century information environment. Whether or not it is fully integrated or accepted by all those concerned remains unanswered.

Interoperability between multiple systems has been addressed, as has multilingual subject access, especially in works presented at international conferences. This corresponds with the issues of nonroman character usage in major bibliographic databases. Issues surrounding authority control, classification, and cataloging principles in general, can be found in several compilations of works.

The urge to move away from MARC and into a pure XML work is still the focus of much research and debate. LC has provided the opportunity for those libraries interested to convert their MARC records to XML; OCLC’s WorldCat database now employs an XML metadata schema; and

books are appearing that show librarians ways to incorporate XML into their daily work environments. On the opposite side of the debate are researchers who have striven to demonstrate that MARC has been misunderstood, misused, and quite often underutilized. The undertones of some authors addressing this debate suggest that moving to a different markup language would potentially allow for previously resolved problems to reoccur cloaked as new ones. Along the same line, educators of catalogers are urged to take into account all the issues discussed above, in addition to teaching the fundamental bibliographic rules and standards.

The two years of literature reviewed here reflect the challenge catalogers face in preparation for the significant changes in practice that will take place within a few short years (e.g., *Resource Description and Access* is due to be published in 2008). Globalization and the variability of language and practice that accompanies it, as well as the continued digitization of formats, will all be affected by the ideas presented in the *Functional Requirements for Bibliographic Records*.

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Index to Advertisers

Library of Congress.....	cover 2
Marcive.....	29
EBSCO.....	50
Archival Products.....	68
Library Technologies.....	cover 3

Archival Products

p/u LRTS 50n4 p. 243

Book Reviews

Edward Swanson

Bibliographic Control of Music, 1897–2000. By Richard P. Smiraglia; compiled and edited with J. Bradford Young. Lanham, Md.: Scarecrow Press and Music Library Association, 2006. 146 p. \$40 cloth (ISBN 978-0-8108-5133-7/0-8108-5133-4). Music Library Association Index and Bibliography Series, no. 32.

Richard P. Smiraglia, professor of knowledge organization and research methods at the Palmer School of Library and Information Science at Long Island University, has taken to heart George Santayana's too-often-quoted aphorism about those who cannot remember the past being condemned to repeat it. In compiling his bibliography, *Bibliographic Control of Music, 1897–2000*, Smiraglia has filled a surprising gap in the literature of music librarianship. In the process, he has brought back to contemporary consciousness both the practical experience and the theoretical scholarship of a century of music librarians. It could not be more timely, as the profession struggles to create a principle-based set of metadata standards in Resource Description and Access (RDA).

Being the scholar that he is, however, Smiraglia has transformed his relatively simple bibliography into an extended teachable moment about the evolution of music cataloging, the major concerns of the profession, and the structure of its discourse community. His introductory "From James Duff Brown (1897) to Arsen Ralph Papakhian (2000): An Essay on the Literature of the Bibliographic Control of Music" (5–30) deserves to be read widely among practicing music catalogers. It is a happy case of the bibliographer being "led out of routine facts into scholarship itself," as D. W. Krummel put it.¹

At the center of Smiraglia's book is the chronological listing of a century plus of publications, some 880 citations of both monographic and periodical literature. It is followed by four indexes for title, author, keyword, and journal title. To my knowledge, there has been no comparable full-length bibliography devoted to the bibliographic control of music. This volume had its genesis in the research Smiraglia began in 1983 for his seminal *Music Cataloging: The Bibliographic Control of Printed and Recorded Music in Libraries* and gestated for over two decades.²

In his introduction, Smiraglia admits that "the coverage, although comprehensive, is not exhaustive, particularly of foreign publications" (1). He lists the print and online sources consulted (2–3) and notes that "unpublished research papers directly relevant to the bibliographic control of music were added as they became known" (1–2).

One could quibble about certain works that have been overlooked. For instance, although Nancy B. Olson's 1981 *Cataloging of Audiovisual Materials: A Manual Based on AACR2* is cited, her later *Cataloger's Guide to MARC Coding and Tagging for Audiovisual Material* is missing in action.³ Deborah A. Fritz's *Cataloging with AACR2 and USMARC for Books, Computer Files, Serials, Sound Recordings, Video Recordings* has also been omitted.⁴

The most unfortunate oversight, though, is that there is but a single reference to the Music OCLC Users Group's (MOUG) *MOUG Newsletter*. (In the interest of full disclosure, I admit to being the OCLC Online Computer Library Center Liaison to MOUG since 1989 and a frequent contributor to said publication.) The omission is particularly ironic, considering that Smiraglia himself has served as both treasurer (1980–82) and chair (1982–84) of MOUG. It should also be said that the omission is understandable, considering that the *MOUG Newsletter* is not regularly indexed in any of the standard sources. But since the *MOUG Newsletter* began publication in 1977, it has grown in importance as a source of information about music cataloging for a wide range of catalogers. A quick look at just a few issues yields substantive articles comparing music cataloging to book cataloging, evaluating sound recording cataloging quality in OCLC's WorldCat, and reporting on the joint Library of Congress/OCLC music uniform title project.⁵ Any one of these is of more import than the one *MOUG Newsletter* citation that does appear in the bibliography.⁶

Given Smiraglia's own declaration of the primacy of the book review as a means of communication in the music cataloging community (25–26), it is also surprising that he has not given better access to the over 140 reviews cited. Reviews are indexed by their authors, but not by the author or the title of the book being reviewed, either or both of which would have been helpful.

These are, however, merely minor shortcomings in an otherwise solid and valuable contribution to the literature of music librarianship, one that fulfills the wider goal of the chronological bibliography, "that of suggesting the development of the field itself."⁷—Jay Weitz, (jay_weitz@oclc.org), OCLC Online Computer Library Center, Dublin, Ohio.

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Preparing for the Worst, Planning for the Best: Protecting Our Cultural Heritage from Disaster. Eds. Johanna G. Wellheiser and Nancy E. Gwinn. Munchen: K. G. Saur, 2005. 192p. 78 cloth (ISBN 3-598-21842-7). IFLA Publications, 111.

This work is the proceedings of an International Federation of Library Associations and Institutions (IFLA) conference held in Berlin in 2003 and includes essays on general aspects of disaster preparation and protection and specific examples of responses to disasters. Global in scope, this book contains discussions of libraries and disaster issues on several continents. Many of the authors stress that each institution's situation is unique, but they also emphasize common themes and issues that all such cultural institutions face. Thus this book is valuable both for the specific suggestions offered and the overall mindset it inculcates.

The first section on national policy planning stresses the importance of cooperation among different types and sizes of institutions. No one library or museum will have the resources or know-how to prepare for and survive all types of disasters, natural or man-made. Sharing information and solutions in advance will enable all the participants to provide a more flexible and timely response to floods, earthquakes, or any other calamity. The authors also report on the importance of advance planning and surveys to determine what to save first and who to call for help.

A section on planning specific to institutions includes museums in Turkey vulnerable to earthquakes. Drawing on their own experiences as well as experts from other earthquake prone areas of the world such as California and Japan, these institutions are able to set priorities for remediation of exhibit and storage spaces as well as make informed decisions regarding new construction. An article on disasters in Sweden stresses the importance of preparing for the psychological aftereffects as well as the physical ones.

Patrons and staff can both suffer when a beloved library is lost to a fire.

Case studies of floods in Prague and a hurricane in Jamaica underline the importance of the practices pointed out by other authors. Being prepared by knowing what everyone is expected to do and who to call for help can make an enormous difference in recovery—both in the amount of time required and the financial resources needed to make good the losses.

Risk assessment and comparisons of collection recovery options are also discussed. Many of the essays include extensive lists of resources for libraries and other cultural institutions initiating or revitalizing their disaster preparedness plans and policies. Most valuable are the organizations, some global, some local or regional, that can assist institutions of any type or size in "preparing for the worst."

This book will not replace a disaster preparedness manual, such as the one from ALA, but it is valuable in developing critical thinking about the specific issues facing cultural institutions. Many collections do not merely have great monetary value but are irreplaceable repositories of a cultural heritage. This is something everybody responsible for preparedness should bear in mind and communicate to their governing bodies and the disaster responders they will be interacting with should the worst happen.

Perhaps the most important point, raised in this work by several of the authors, is that disaster planning is a process. It does not end with the production of a thick binder that rapidly disappears in the back of a filing cabinet or the top shelf of a busy director's office. Public-service librarians as well as conservators should be thinking about the possibilities inherent in new acquisitions and new construction. Thinking critically about what to do in a worst case scenario should not be a constant obsession, but it should be an important factor in any new initiative a cultural institution undertakes. By bearing in mind the examples provided in this volume and taking advantage of the many resources included in it, your institution will not automatically be better able to deal with seemingly overwhelming catastrophes, but if you can ensure your constituents and yourself that you have done all that can be done to prepare and react to disaster, you will have taken the first steps to recovering and rebuilding both your personal and institutional confidence.—*Dan Forrest, (dan.forrest@wku.edu), Western Kentucky University, Bowling Green.*

The Preservation Manager's Guide to Cost Analysis. Elise Calvi, Yvonne Carignan, Liz Dube, and Whitney Pape. Chicago, Ill.: Preservation and Reformatting Section, Association for Collections and Technical Services, American Library Association, 2006. 58p. \$47 (ALA members: \$42) paper (ISBN 0-8389-8365-0)

This slender volume—which, speaking of cost analysis,

comes to about \$0.81 per page—when used by library managers to determine preservation costs could rapidly pay for itself, as an indirect cost of an item (after first determining whether it is supply or equipment) that could be amortized out over at least five years!

In all seriousness, this is a valuable work for any person in charge of preservation efforts, with too many resources needing preservation and too little money and staff to do all the work. The digital side of preservation (such as scanning heavy-use, hard-copy materials in order to have the hard-copy items less handled and therefore preserved) is included in the concept of preservation work.

The focuses of the writing style are clarity and brevity, with use of tables, examples, and bulleted lists to make points clear with a minimum investment of the reader's time. For example, Chapter 1, "The Role of Cost Analysis in Preservation" (1–2) is two pages long and is remarkably to the point. Chapter 2, "A Methodology for Cost Analysis" (3–5) is almost as brief; it lists and expands upon the eight major steps of the costing process—define item to be costed, understand purpose of costing exercise, determine cost basis, gather information on work process, identify and quantify cost components, calculate cost, document assumptions, and perform reasonableness tests. In Chapter 3, "Identifying and Calculating Costs" (7–28), we get to the difficult work of costing supplies and equipment, services, labor, and indirect costs, and in Chapter 4 (29–39) there are two costing exercises, one for deacidification and one for phase-box creation. The latter is especially helpful because it gives two different costing examples, one for in-house work and the other for outsourcing of the work.

In Chapters 5 ("Review of the Literature on Cost Analysis," 41–46) and 6 ("Selected Annotated Bibliography," 47–56), the authors perform this reviewer's work, by listing related works and discussing them. While there has been extensive work on cost analysis of library operations, there seems not to be any other publication exactly like this one on cost analysis of preservation in libraries. The last chapter is divided up by subject (preservation literature, subdivided into general, binding, deacidification, digitization, and microfilming; library literature; technical services literature, subdivided into general and cataloging; and business literature). Each citation has an approximately one-hundred-word annotation. The digitization section of two pages (the largest section in this chapter) includes the major works with which this reviewer is familiar, plus several more citations which the reviewer intends to pursue.

This is a work that will immediately be put into use in this reviewer's collection. While reading the work, occasionally I would think, "But that's an obvious point," and then realize it was obvious only because I have worked in libraries for thirty-five years and for the last ten of them have relatively frequently performed cost analysis of pro-

viding services. For persons new to doing cost analysis, this work can shortcut the learning experience and make it possible to avoid painful learning experiences.—*Mary Lynette Larsgaard, (mary@library.ucsb.edu), University of California, Santa Barbara.*

From Catalog to Gateway: Charting a Course for Future Access: Briefings from the ALCTS Catalog Form and Function Committee. Ed. Bill Sleeman and Pamela Bluh. Chicago: ALCTS, 2005. 120p. \$54 (ALA members: \$48.60) paper (ISBN 0-8389-8326-X)

In 1993, the Association for Library Collections and Technical Services (ALCTS) Catalog Form and Function Committee (CFFC) developed plans to produce a series of briefing papers to track aspects of the development of the online catalog and its effect on users as it continued to evolve during the 1990s. The CFFC wanted the papers to provide timely and authoritative information for professionals to help them keep up with developments. To this end, the CFFC solicited topic ideas and selected authors to write a series of eighteen short papers that were published in the *ALCTS Newsletter* from 1995 to 2001. This monograph republishes all eighteen papers in their original forms with the addition of an introduction written by Arlene G. Taylor. The introduction describes the history behind the papers, provides a copy of the guidelines for the series, and gives a brief synopsis of each paper describing why it is significant. The papers "are a microcosm of the developments of the online catalog as it moved from being a system for identifying what is owned by a particular institution to being a system for providing access to information in all forms regardless of ownership" (3).

The book succeeds admirably in providing primary source documents related to the history of online catalogs. The papers ably track the significant issues surrounding online catalog development as it was happening and reflect the concerns of their time. Many of the papers discuss the problems of the day, such as the paper by Harriette Hemmasi, David Miller, and Mary Charles Lasseter on the implementation of the MARC fields and subfields for form data in 1998. Thomas Dowling discusses the initial problems in 1997 created by the switch to Web-based online catalogs. There are papers that address online catalog requirements by Peter Graham, Michael Buckland, and Ellen Crosby that are purely historical at this point, yet represent the thinking of the time.

Many of the papers make recommendations. It is interesting to read these articles and see which of their solutions were followed and which have gone in unexpected directions. For example, Mary Micco's two papers, written in 1995, discuss subject authority control on the Internet. They call for authors of Web documents to provide subject classification numbers and for expert systems to use those

numbers to create subject maps of the Internet. As it turned out, getting authors to supply classification has been problematic and search engines like Google have become the preferred method for information retrieval on the Web. On the other hand, Edward Gaynor's paper debating the usefulness of Standard General Markup Language (SGML) versus the MARC format written in 1996 raises many of the same points later made by Roy Tennant in his call for the end of the MARC format and a switch to catalogs using eXtensible Markup Language (XML) in 2002.¹

Some of the papers contain information that is still relatively current and provide good introductions to their topics. Karen Calhoun and Bill Kara do an excellent job of presenting the two ways to catalog electronic journals and articles in aggregator packages (single versus multiple records), and Beth Guay discusses ways to use the MARC linking fields to make either approach more comprehensible to the user. Sharon Farb's paper on universal design illustrates the problems faced by users with disabilities. Martha Yee provides a summary of the International Federation of Library Association and Institution's (IFLA's) guidelines for OPAC displays. Both papers have recommendations that would make our online catalogs much more user-friendly, yet are not widely discussed today. Larry Dixon presents two papers on how Z39.50 actually works, and William Moen explains why it does not work as well as it should because of interoperability problems. Barbara Tillet's paper is an excellent primer on the problems of name authority control in an international environment. Colleen Hyslop has two articles describing the Program for Cooperative Cataloging (PCC) and the reasons behind its creation.

If the book has a flaw, it is the fact that the papers only go through 2001. No mention is made of why the CFFC decided to end the series. It is interesting to note that none of the papers discuss Google even though it debuted in 1998. The members of the CFFC did not foresee today's furious debate about the need for online catalogs and cataloging when users prefer to search Google to find information. Yee's paper on online catalog displays makes a passing mention of IFLA's Functional Requirements for Bibliographic Records (FRBR), which also came out in 1998. Again this is a topic of keen interest to catalogers in the new millennium. To a cataloger in 2006, the absence of these topics makes the collection of papers seem incomplete and dated, even though much of the information is still current today. The collection's main value is that of historical source.—*Dana M. Caudle, (cauldlda@auburn.edu), Auburn University Libraries, Auburn, Ala.*

Reference

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Guidelines for Online Public Access Catalogue (OPAC) Displays: Final Report, May 2005. Recommended by the Task Force on Guidelines for OPAC Displays; approved by the Standing Committee of the IFLA Cataloguing Section. München: K. G. Saur, 2005. 34 cloth (ISBN 3-598-24276-X). IFLA Series on Bibliographic Control, v. 27

This brief work is divided into two sections: principles (16 pages) and recommendations (23 pages), the latter largely composed of examples of online public access catalogue (OPAC) displays.

The focus of the guidelines (not standards) is on the display of bibliographic and authority records for the public in general libraries. There is some discussion of searching, but creating standards for searching is not a purpose of the report, nor does it address displays for library functions, e.g., acquisitions or serial check-in.

Although bibliographic records and current integrated library systems (ILS) are not yet equipped to handle Functional Requirements for Bibliographic Records (FRBR) recommendations concerning showing relationships among manifestations of works, samples are included of what such displays might be.

There is an extensive international bibliography (5 pages), which had insufficient editing. For example, two research projects produced at the University of Toronto as a requirement for the Master of Information Science degree are listed, but neither is identified as such. One has the University as publisher (Chan), the other gives no publisher (Luk). The bibliography lists me under my middle name (McRee) rather than my surname (Elrod). Professor L. C. Howarth was faculty reader for both of the research projects mentioned above and is also the chair of the task force that produced this report. These two research projects, like this final report, fail to consider an International Standard Bibliographic Description (ISBD) display.

With the move from card catalogs to online catalogs, library system developers and vendors have largely taken over from catalogers the role of catalog building, reducing catalogers to individual record creation. The ISBD has been largely abandoned as a standard for display.

This publication might have represented an effort by catalogers to resume their traditional role as catalog builders, and to restore the ISBD as a standard, a standard that rests on over a century of cataloger experience in catalog creation. But not one of the examples in this work is of an ISBD display, which is strange for an International Federation of Library Associations and Institutions (IFLA) publication, since IFLA created the ISBD.

For the most part, in our OPACs, labeled displays have replaced paragraphed ISBD displays, taking up valuable display space, and mislabeling elements, such as criminal defendants, composers, illustrators, translators, editors,

and so on, as “Authors.” This report does not question that development.

All examples in this work assume labels, and most use “Author,” although there are examples in languages other than English, and one example uses “Personal Name” (6). The closest to an ISBD display is one labeled “Brief Description” (13), although elsewhere “Description” is used to label collation.

The *Anglo-American Cataloguing Rules*, Second Edition (AACR2), their proposed replacement Resource Description and Access (RDA), and MARC21 could all mandate ISBD display. Instead, the RDA creators seem to have decided to relegate ISBD to an appendix as an option for description and display. That does not bode well for availability of ISBD-compliant software from vendors, who seem to find it preferable to make fun of ISBD punctuation and design over more elaborate labels to help the catalogue user. As Bernhard Eversberg has repeatedly stated in Autocat postings, labels work less well where not everybody speaks English, unless the patron has several sets of labels from which to choose. But even then, some data elements refuse to be neatly labeled. If MARC were to say “records are to be displayed in ISBD order and with ISBD punctuation,” that’s what everybody would do. There is a good example of a MARC display (fig. 14 d).

Included in this final report’s bibliography is the very useful work by Martha M. Yee and Sara Shatford Layne upon which an IFLA recommendation paper was based.¹ On pages 114–15 of that report, Yee and Layne list field labels based on AACR2, MARC, and labels found in existing systems.

The November 24, 1998, Draft IFLA publication called “Guidelines for OPAC Displays,” prepared for the IFLA Task Force on Guidelines for OPAC Displays by Martha Yee, unfortunately was withdrawn. It is included in a paper that Yee gave at the 1999 IFLA Council and General Conference.² It has helpful sorting suggestions missing from this final report.

My only reservation concerning Yee’s earlier recommendations is that I have found inverse chronological display, particularly under subject, to work best, regardless of subject matter. Most patrons select an item from among the first five or so displayed. Long arts and social science retrieval lists are helped by inverse chronological arrangement as are science ones. Authors whose surnames begin A–M, who circulate more frequently, are no more authoritative than authors whose surnames begin N–Z, who circulate less frequently. The same reservation applies to the final report. A sample display allows clicking for sorting results by ascending or descending date (10), but it is not the default subject set sort.

Another Yee paper that should become a landmark in our effort to find a tool to use in dealing with vendors concerning our requirements for good library online cata-

logue software, and patron friendly displays, and which is vastly superior for this purpose than IFLA’s final report is “Principles for the Display of Cataloger-Created Metadata” (February 15, 2002, draft), an expansion of her withdrawn IFLA paper.³ There are copious examples, including (Figure 14, p. 112) of ISBD displays.—J. McRee (Mac) Elrod (mac@slc.bc.ca), *Special Libraries Cataloguing, Inc., Victoria, B.C., Canada*

References

1. Martha M. Yee and Sara Shatford Layne, *Improving Online Public Access Catalogs* (Chicago: ALA, 1998).
2. Martha M. Yee, “Guidelines for OPAC Displays,” 1999. www.ifla.org/IV/ifla65/papers/098-131e.htm (accessed Oct. 15, 2006).
3. Martha M. Yee, “Principles for the Display of Cataloger-Created Metadata,” Feb. 15, 2002, draft. <http://slc.bc.ca/yee/pdf> (accessed Oct. 15, 2006).

Brief Reviews

MARC21 for Everyone: A Practical Guide. By Deborah A. Fritz and Richard J. Fritz. Chicago: ALA, 2003. 188p. \$48 (\$43.20 for ALA members) paper (ISBN 0-8389-0842-X).

Fritz and Fritz stress repeatedly—and appropriately—that their book is intended as a general overview of MARC, not as a detailed MARC manual. Given its stated purpose, *MARC21 for Everyone* provides a remarkably thorough introduction to MARC coding for bibliographic records. Its only significant weakness is that it was published in 2003, and some of the information and examples are already outdated.

But is it really for everyone, as the title claims? And is it really a practical guide? The answer to both questions is yes, with some qualifications.

The titular “everyone” encompasses most library staff. Chapter 6 delineates “Who Needs to Know What” for staff in all areas of public and technical services, as well as systems and administration. The information in this book will satisfy the needs of most of these groups but not all. For example, the authors note that “catalogers need to know everything about MARC, in much more detail than we will cover here” (61). However, even for (new) catalogers, the work could be a useful introductory training tool.

The claim that *MARC21 for Everyone* is a practical guide is subject to a stronger qualification. The book is divided into Part 1, “MARC: The Underlying Fundamentals,” and Part 2, “MARC21 Codes You Should Know.” Part 1 contains background information on cataloging in general and MARC in particular. While not exactly impractical, it probably contains more historical information than some readers care to know, particularly those who want to understand just enough about MARC to perform their jobs.

On the other hand, Part 2 contains practical, nuts-and-bolts information about using and deciphering MARC coding. The authors' intention is to "present [the reader] with the most common fields found in MARC21 bibliographic records" (63). In general they have omitted only relatively obscure fields. Part 2 consists of four chapters, each devoted to fields that serve the same function (for example, all the "indexed" or "heading" fields are discussed in Chapter 7). This organization makes the book much more user-friendly for beginners than would a strictly numeric arrangement. Readers who want to look up a particular field can use the index to do so.

The book's added features, such as screen shots and tables, quizzes at the end of each chapter, and a robust glossary, help to make *MARC21 for Everyone* a valuable tool for learning (and teaching) MARC basics.—*Sarah Yates, (yates006@umn.edu), University of Minnesota Law Library, Minneapolis.*

From A to Zine: Building a Winning Zine Collection in Your Library. Julie Bartel. Chicago, IL: American Library Association, 2004. 152p. \$35 (ALA members: \$31.50) paper (ISBN 0-8389-0886-1)

Of greater scope than its subtitle suggests, *From A to Zine: Building a Winning Zine Collection in Your Library*,

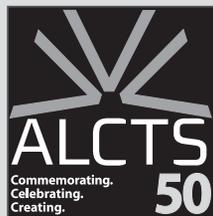
discusses not only establishing and building a zine collection, but also addresses issues of access, cataloging, circulation, preservation, publicity, programming, and outreach. Julie Bartel, the author of this slim yet unique volume, is the founder and coordinator of the Salt Lake City Public Library's nearly decade-old zine collection. While zine collections remain uncommon, especially in public library contexts, Bartel frames both philosophical and pragmatic arguments in their support, offering firsthand examples of how zines have allowed unique engagements with users.

While public librarians will find this book most helpful, any librarian working with zines will find useful information as well as many highly valuable appendixes offering information including review sources, online discussion groups, libraries, and specialty stores. Readers would, however, appreciate a more nuanced discussion of e-zines. While correctly emphasizing the importance of tangibility and physical aspect in much of zine culture, Bartel's overly dismissive stance towards electronic parallels (represented by a brief afterthought of a final chapter) leaves an inviting ellipsis for the next writer on this topic.—*Darby Orcutt, (darby_orcutt@ncsu.edu), North Carolina State University, Raleigh.*

ALCTS, LRTS 50th Anniversaries

The stellar lineup of events highlighting the Association for Library Collections & Technical Services (ALCTS) 50th anniversary celebration, "Commemorating our Past, Celebrating our Present, Creating our Future," will begin at Midwinter Meeting's Anniversary Year Kickoff Reception and will include the ALCTS National Conference, a gala dinner cruise, and the annual President's Program featuring Peter Morville, author of *Ambient Findability* and president of Semantic Studios.

ALCTS members and *Library Resources & Technical Services* (LRTS) subscribers will also enjoy anniversary articles, a complimentary copy of the fifty-year cumulative index to LRTS and the reissue of LRTS volume 1, number 1. A 50th anniversary commemorative publication will be available for purchase through the ALA Online Store in late 2007.



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Library of Congress, Network Development and MARC Standards Office, “MARC 21 Concise Bibliographic: Control Field 008” (Washington, D.C.: Library of Congress, 2004), www.loc.gov/marc/bibliographic/ecbd008s.html#mrcb008b (accessed May 8, 2005).
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