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Subscription price: To members of ACRL, $25, included in membership dues; to nonmembers, U.S. $50; Canada and Mexico $55; and other foreign countries $60. Retrospective subscriptions not accepted. Single copies and back issues, $14 each.

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Editorial

Poverty into Wealth

On September 1, 1995, Graham B. Spanier became the 16th President of The Pennsylvania State University, the current home of C&RL. I began this editorship under his academic leadership as Provost at Oregon State University where Director of Libraries Mel George’s recurring lament was that the social contract between the public and its libraries was undergoing a radical change for the worse. Once there had been an agreement that libraries and education were public goods and should be supported without question, but now, increasingly, the public cares more for concrete solutions to easily understood problems. Librarians can perhaps understand this eroding support in terms of Abraham Maslow’s hierarchy of needs, a model devised to explain the nature of human motivations, specifically in the professional world. Maslow believed that people are motivated by unmet needs in a hierarchical order. Unless all lower-level needs have been met, higher level ones cannot be addressed. Perhaps now, educators and librarians must begin to convince the public that education replaces the poverty of simply fulfilling a physical need with the wealth of a happy, productive, and socially beneficial life.

The areas of the hierarchy above represent their relative strength to influence human behavior and the order in which they must be satisfied. This year spending for prisons in California exceeded spending for education. Because prisons represent a concern for safety, near the larger bottom of the hierarchy, and because education represents self-esteem and self-actualization, the electorate funds prisons while college programs close. Education aids individuals in achieving self-actualization which allows them to appreciate concepts, such as the public good. Education must compensate for its loss of the public good mystique and its lesser motivational power by preparing and presenting a stronger case to the public. However, many view education as a means for preventing crime, and, therefore, prisons. Thus, continuing to fund prisons at the expense of education exacerbates the societal problem.

Raymond Smock recognizes the relative strength of appeal inherent in Maslow’s hierarchy when he pleads for the National Digital Library Federation (NDLF) to include humanities materials in its selections for digitization. He admits, though, that “we cannot demonstrate that humanities research is directly profitable to the stockholders of the NII (National Information Infrastructure).” Preparing materials to be placed in this resource is expensive, costing as much as...
$100 a volume for scanning, and requiring frequent, perhaps even annual, refreshing to keep text files readable by current computers. Because the NII is being built and controlled by the private sector, Smock worries about digitized reruns of I Love Lucy pushing out access to Thomas Jefferson's papers. Since the most popular and obvious materials will be made available by the commercial sector, and since both science societies and science publishers are rushing ahead into the digitized world, perhaps the NDLF should pay particular interest to the humanities.

Richard Lucier, a creator of the Genome database and Project Red Sage, recently illustrated the difficulty of competing for funds even inside his own institution, the University of California at San Francisco Health Sciences Center. In 1991 the campus provided 90 percent of the funding for his programs; now it provides only 75 percent. By 1999 he thinks he will be required to generate half the income to support library services on the campus. Sources of income will include such old standbys as photocopying and charging for different types of searches, and such new programs as vending databases and specialized information management aids. While the timing of this pay-your-own-way scenario may be sooner for Lucier's operation than for more traditional college and university libraries, the direction seems consistent with the observations above.

My colleague Ron Dow and I enjoy a continuing debate on the core nature of an academic library. Dow argues that libraries exist to serve their communities. Collections should be developed and services should be created to satisfy that community's needs. To the extent that the library can discern and meet the primary needs of its community, it prospers. In a business sense, the library must regularly account for its costs to the institution by justifying its existence to the community it serves. Dow maintains that the library as a philosophical construct, whose intrinsic worth on campus is mandated by its very existence, is impractical and out of step with the operating environment of higher education at the end of the 20th century.

I part company with those who:
- demand more money for prisons than education;
- view information only in economic terms;
- insist that the library pay its own way; and
- fail to assign a value to the intrinsic worth of the library on campus.

I maintain that there is an intrinsic worth to a library. The library on campus in not just an organization designed to dole out academic services on a cost-recovery basis, whether that cost recovery occurs at the user or institutional level. The library stands for something bigger, for meeting, on the Maslow hierarchy of needs, the human need for learning and culture.

The university has a much broader and nobler mission than selling credit hours. In his "Inaugural State-of-the-University Address," Graham Spanier, speaking about his family's immigration to the United States, concludes, "For me, education is society's mechanism for turning despair into hope, for raising the social consciousness of the community, for altering the course of families, for turning poverty into wealth, and for improving the quality of life. Only education could allow a poor immigrant who grew up on the south side of Chicago to become the President of Penn State." Spanier summarizes here what academics around the country believe about the importance of their contribution to society. We would like to return to those happier days when librarians and education were supported as public goods. Meanwhile, we must invent ways to make our vision of the benefits of higher education as powerful to the public as the vision of incarcerated
criminals. Society must believe, as educators do, that education turns poverty into wealth.

GLORIANA ST. CLAIR

The editor wishes to thank Ron Dow for this and other ongoing discussions and for his help with the editorial, and Karen Gerboth for her assistance with research and manuscript preparation.

Notes


Service Quality in Academic Libraries by

This book examines service quality, identifies its essential elements and discusses ways in which service quality can be assessed quantitatively and qualitatively.

Peter Hernon,
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Available Jan. 5, 1996
The Economics of Professional Journal Pricing

Michael A. Stoller, Robert Christopherson, and Michael Miranda

The problems of excessive inflation and price discrimination in journal pricing continue to plague libraries. In analyzing the causes of the current crisis, the authors review and evaluate previous contributions to the literature on journal pricing with particular emphasis on the three types of price discrimination practiced by journal publishers. The authors suggest that the monopoly power of commercial publishers, combined with a third-party payment system, are at the heart of the problem. They suggest solutions that involve providing appropriate incentives to journal users, adoption of more equitable pricing systems, and employing the potential monopoly purchasing power of library associations to lower prices.

After more than two decades of extraordinary inflation, professional journal prices continue to increase at rates several times as high as the American economy's overall inflation rate and far higher than the rate of cost increase in the journal publishing industry. Academic economists, marketing researchers, librarians, and paid economic consultants have undertaken economic analyses of journal markets in order to explain the high rates of price increase and the great extent of price discrimination against libraries and United States buyers in general. Some of the researchers subsequently recommended solutions to library administrators, and many of their suggestions are sound and practical. However, a number of the studies are fraught with analytical errors and recommendations that were either economically illogical, impractical, or both. The authors intend to summarize the literature in this area, correct the analysis, and provide practical policy recommendations for library administrators based on what the application of economic principles really tells us about the journal market situation.

The Natural Monopoly Misconception
Several researchers have analyzed the academic journal industry and labeled it a natural monopoly. Despite the researchers' claims, the academic journal industry is not a natural monopoly. A natural monopoly is an industry in which the cost structure is such that the average pro-

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duction cost per unit of the product continues to fall throughout as the firm's production increases (see figure 1). Therefore, one firm can produce the entire industry output more cheaply than having a group of competing firms. Because large firms usually have production cost advantages over small ones, it becomes difficult for small firms to compete and for new firms to enter the industry successfully.

The type of price discrimination practiced by journal publishers is perfectly legal because it is not aimed at putting anyone out of business or disadvantaging a particular group of buyer-resellers through a limited discounting program.

Public utilities, such as electric, natural gas, and local telephone firms, are the classic examples of natural monopolies. The existence of natural monopolies is the justification for federal, state, and local governments granting public utilities franchised monopolies on the grounds that having more than one local electric, water, telephone, or natural gas supplier would be uneconomical. Competition in these industries would require duplication of transport and connection facilities throughout the service area and would be unnecessarily costly. Hence, state and local governments grant monopoly franchises to utilities and then regulate their prices because there is no competition to keep the prices low.

Certainly there are economies of scale that cause the average cost of journal production to fall as output increases, mostly because of the high initial setup (i.e., first copy) or fixed costs. That is also true for the automobile industry, all of the other publishing industries, or any manufacturing industry for that matter. Typically, cost per unit will fall as the firm expands, but only up to a particular output level. Beyond that production level, per unit cost does not continue to fall and may eventually even increase. There is not a continuously declining cost curve that mandates that there can be only one efficient
producer of the product, as would exist in a natural monopoly industry, hence the name “natural” monopoly. Firms simply must be large enough to produce efficiently, and in the journal industry, as in most manufacturing industries, the state of technology is such that many firms can operate efficiently, each producing a small percentage of industry output at the minimum average cost (i.e., cost per unit). However, the fact that the technological conditions for a natural monopoly do not exist in the journal publishing industry should not be interpreted to mean that there is no monopoly power in this industry. It is simply not a “natural” condition that is dictated by the state of technology.

Price Discrimination in the Journal Publishing Industry

A number of researchers have investigated the issue of price discrimination or dual pricing in academic journals. Price discrimination, in its simplest form, is charging different prices to different buyers for the same good or service. Journal pricing, however, is fraught with price discrimination of at least three different varieties, two of them more complex than the simplest form:

1. Commercial and noncommercial journal publishers usually charge academic libraries considerably higher prices (often three times or more as high) than they do individual subscribers for the same quantity of an identical product, i.e., a one-year journal subscription.

2. Western European journal publishers usually charge American buyers considerably higher prices than they do European subscribers for the same quantity of an identical product, after allowing for differences in shipping costs and the risks of exchange rate fluctuations.

3. Publishers, particularly commercial firms, charge far higher prices for natural science and engineering journals than for journals in other fields, on a per page basis after allowing for any differences in production and shipping costs and costs associated with variation in the frequency of publication.

Not surprisingly, economists are interested in these phenomena. In fact, that interest in price discrimination led at least one of this paper’s authors to begin doing research on the topic of journal pricing. The authors will explore why price discrimination occurs in journal markets, and why it persists to such a great degree when it does not exist at all or in such a blatant manner in other goods markets.

Several articles in library science journals simply restate the standard economics textbook list of conditions that are conducive to the existence of long-term price discrimination. The authors assume that all of these conditions are met by the academic journal industry, without studying the situation in depth, because of the long history of price discrimination in this industry. These conditions include the following:

1. There are different markets with substantially different price elasticities of demand (i.e., different degrees of responsiveness to changes in price) that may be identified and kept segregated by the seller (for example, libraries versus individual subscribers or North American customers versus European customers).

2. There are no effective markets for low-price buyers to resell to high-price buyers.

3. Competitors must not be able to undersell the price discriminator in the market segment that is being charged the higher price (i.e., the seller must have monopoly power).

4. The seller’s cost of segregating the market must not be greater than the extra revenue generated from price discrimination.
5. The practice of price discrimination must not breed ill will among consumers.
6. The discrimination must not be illegal.

Certainly most of these conditions must exist to some extent because price discrimination persists, but it is worth studying these conditions individually to see whether there is a possible chink in the publishers' armor through which those being discriminated against may be able to lessen the extent of price discrimination. Some libraries are finding effective ways to deal with this problem (e.g., forming purchasing consortiums or raising their elasticities of demand by sharing journals or purchasing copies of individual articles rather than subscribing to a journal). The assumption that there is no ill will from price discrimination is certainly questionable. The question is whether such ill will can be transformed into an effective weapon against price discrimination.

Edward Dyl implies that price discrimination, as practiced by journal publishers, may be illegal under the prohibitions of the Robinson-Patman Antitrust Act, and he notes that the federal government has never tested this law's provisions on the academic journal industry. In fact, the Robinson-Patman Act could not possibly apply to journal price discrimination because it is a piece of depression era legislation aimed at protecting small competitors from large ones (most notably from A&P, the retail giant of the 1930s). It outlaws price discrimination only to the extent that large buyers cannot be offered discounts that are not available to smaller buyers. The type of price discrimination practiced by journal publishers is perfectly legal because it is not aimed at putting anyone out of business or disadvantaging a particular group of buyer-resellers through a limited discounting program. There is nothing illegal in price discriminating against a group of customers under the Robinson-Patman Act, and it is a very common practice. For example, consider the variety of ticket prices charged by airlines or movie theaters for equal-quality seats.

The Equity Question: Is Price Discrimination Fair?
Publishers might argue that price discrimination in journal pricing is fair based on the fact that library copies of journals are read much more frequently than individuals' copies and that photocopying from library copies is quite common, with no remuneration to the publisher. Welfare economists, aiming for efficient use of resources, normally are most concerned about prices reflecting, and preferably equaling, the market value of the resources that go into the production of a product; or more simply stated, they think that price should equal marginal production cost. However, many other individuals would no doubt be sympathetic to the concept of price reflecting the value of the product to the users, and they might argue that the total value of a library copy of a journal that is read by many readers is greater than the value of a personal copy that is read only by an individual subscriber. Therefore, they would claim that the library copy ought to sell for a higher price. This argument gains more strength if the readers of the library copy are able to make inexpensive personal photocopies of journal articles.

If one agrees with the latter point of view and employs it as a justification for price discrimination, the logical extension is that a journal pricing system based on expected usage should exist. Publishers could charge college and university libraries according to the number of expected users. This number could be estimated easily from the undergraduate and graduate enrollments, with graduate enrollments weighted more heavily in a simple pricing formula. One can argue the fine points of such a pricing system (e.g., should university or program en-
rollments be employed?), but enrollment data are normally available to library administrators who could then supply them to publishers. Although such a system would not be perfectly fair, it would be considerably more equitable than the current two-price system which greatly disadvantages small college libraries with limited budgets that make more limited use of library journals than large research libraries which pay the same price. Simply basing journal prices on readily available total institutional enrollments (perhaps using enrollment intervals) would be more equitable than the current two-price system, for which there is little equity-based justification. Indeed, the advent of the electronic journal, with the possibility that its pricing will eventually be based strictly according to usage, may lead to the most equitable pricing system as well as the most efficient use of society’s resources. Subscribers can be charged for and will receive only the articles they plan to read, saving resources for both producer and consumer. Charges will reflect the number of readers because each reader will be charged individually. Extensive pay-per-use operations are already in place in many libraries.

Industry Structure and Unique Industry Characteristics

Given the preceding criticism of much of the economic analysis that researchers have carried out to date on the journal industry, the next logical step is to describe the actual economic structure of this industry. More to the point, what is there in the structure and conduct of this industry that makes it perform the way it does?

First, there appears to be a great deal of monopoly power in this industry, although it is not a natural monopoly. \(^{27, 28}\) Given the uniqueness of individual journal articles and the existence of copyright laws, there appears to be no direct competition among publishers of different journals in the same academic field. Every issue of every journal is unique. Because authors of research articles are normally expected to read and cite all articles relevant to their research topics, they cannot omit reading an article in favor of a close substitute. There are no substitutes, unlike the magazine market, for example. Whereas *Newsweek*, *Time*, and *U.S. News* compete with and are considered to be substitutes for each other by most news magazine subscribers, the *American Economic Review* and the *Journal of Political Economy* are not really competitors. Libraries must buy both journals, and economic researchers must read the relevant articles in both. Therefore, every publisher of a major journal should be considered a monopolist. In this sense, the journal publishing industry is truly unique. There is a captive audience for all major journals.

A second important and somewhat unique characteristic of the industry is that, to the extent that journal marketing is primarily directed at librarians, the demander and ultimate user is neither ordering nor paying for the product; those activities rest with the library. \(^{29}\) The importance of this characteristic can be seen by looking at a similar industry—pharmaceuticals. Many, if not most, people who use prescription drugs do not pay directly for them; insurance companies do. It is no coincidence that prescription drug prices are high; the rate of drug price inflation persistently has been above the United States’s average rate of inflation, and the drug industry consistently has had average profits two to three times the rate of return of the average American manufacturing industry. Demand for a product will always be greater when the
user is spending someone else's money. Although this point is not made in many standard economics texts, it is acknowledged widely by economists. Professional journals and pharmaceuticals are two of the few industries in which this purchasing situation exists, along with other sectors of the health care industry.

Monopoly and third-party payment are the two key characteristics that explain pricing behavior and the apparently high price levels in the academic journal industry. A third unique characteristic is that the industry contains many nonprofit producers who "bundle" journals along with other products as part of membership packages in a manner that law enforcement agencies might consider to be an antitrust violation in profit-oriented industries. Membership and the purchase of several journals become essentially an all-or-nothing proposition, hence the term bundling. This practice also makes it difficult for researchers to determine the individual journal prices. The American Economic Association, for example, includes three major journals (thirteen issues) as part of an annual association membership for fees ranging between $47 and $66 in 1994 (depending on the member's income level). Members can save six dollars by refusing one of the journals, but they cannot save more than six dollars, although the association claims that 30 percent of the membership fee goes to pay for each of the three journals.

The Effect of Structural Characteristics on Performance
Given these unique structural characteristics, the authors next attempted to determine what effect they have on performance in the academic journal industry. The authors know that price discrimination requires the presence of monopoly power, or otherwise competitors will undercut the high prices charged to the buyers who are being discriminated against—in this case, libraries. The existence of monopoly power also means that if the price discrimination does breed ill will, there may be little that the buyers can do. This is especially true if the buyers (i.e., libraries) are not the ones requesting and using the product. In this market, ill will clearly exists, but it rarely affects the pricing behavior of the sellers unless it is accompanied by hostile actions on the part of libraries. Therefore, it should not be surprising that there has been a persistent tendency for the most expensive journals to have the largest percentage price increases. 30

As several writers note, the monopoly power of journal publishers leads to highly inelastic demand from research libraries, in part because faculty demand, and will not accept substitutes for, specific journals which the faculty do not pay for and for which they rarely know the price. 31-34 Meanwhile, individual subscriber demand is much more elastic regarding purchasing personal subscriptions because individual subscribers can photocopy articles at little or no cost in their libraries or obtain copies through interlibrary loan, whereas personal subscriptions usually must be paid for out of their own household budgets.

Hence, a perfect scenario exists for publishers to implement price discrimination. Publishers' claims that the large number of readers of library copies of journals justifies a higher price should be disregarded. One might draw a parallel between this situation and the American Medical Association's efforts to justify high prices charged by medical doctors on the basis that they must invest so many years in training. Such moral justification has nothing to do with the price level or pricing structure. A firm can only charge high prices and price-discriminate if market conditions allow. The equity-based arguments of the publishers, whether they provide moral justification for the pricing practices or not, are beside the point. Photocopy pricing and quality may be correlated over time with the extent of
price discrimination in journal pricing as S.J. Leibowitz suggested, in that the availability of inexpensive, good-quality photocopies of library journal articles may keep personal journal subscription prices low. However, this cannot explain fully why price discrimination against libraries exists to the extent that it does in the journal publishing industry. 35

Similarly, much of the price differences among journals in different academic disciplines appears to be the result of price discrimination by discipline rather than differences in production cost, although the supporting evidence for this statement is limited and further investigation is needed. 36,37 Journals in the natural sciences and engineering fields are far more expensive than journals in other fields. When seeking an explanation, one often hears that the printing cost of the mathematical symbols and illustrations is the reason for the high price. Yet, the price differentials appear to be far higher than printing cost differentials would seem to justify, and art journals, with expensive illustrations, are not particularly high priced. 38

The answer to the question on price differences by discipline may be much simpler and quite consistent with what economic theory would predict. Publishers charge more for natural science journals because they are able to do so. As one commercial publisher marketing executive (who prefers anonymity) of a major for-profit journal publisher stated in an interview, publishers charge higher prices for science journals because natural science research is considered more urgent and is far better funded than other types of research. Scientists need these journals, and they have funds to pay for them. It is a simple case of maximizing profit by charging higher prices in markets where demand is inelastic. It should also not be surprising that commercial publishers are more dominant in science and engineering than in other disciplines. One study found that commercial firms published over 63 percent of the chemistry journals that a particular major research library purchased, and these firms received almost 80 percent of the subscription money paid for chemistry journals by that library. 39

Although commercial publishers claim that their prices and profits are not excessive, there is good reason to believe that the commercial journal publishing industry is highly profitable and has become more profitable during the past two decades of rapid price increases and increasing price discrimination. 40 Economic Consulting Services (ECS) points to "the rapidly growing disparity between the costs of publishing and subscription prices charged to libraries." 41 The aforementioned journal marketing executive pointed out the ideal market situation in which commercial journal publishers exist, despite facing rapidly rising costs. They not only have a monopoly, but their customer base is prepaid and virtually guaranteed for years into the future. The publishers know exactly how many copies to print, incur no debt up front, receive no returns from bookstores, and never have to pay for a second press run. In many ways, the journal publishing business is far more lucrative than the book publishing business, he noted. A quote from an interview with the late Robert Maxwell, former owner of Pergamon Journals, in which Maxwell called his journal operations a "cash generator twice over," supports the view of the marketing executive. 42

When asked to explain the disparity between library and individual subscription prices, the marketing executive’s re-
sponse was simply that he believed commercial publishers charge the maximum that they can get. They know that individuals will not pay the prices that libraries are charged. This is the same conclusion that noted economist Fritz Machlup reached regarding the pricing strategies of scholarly book publishers almost two decades ago.43

Policy Recommendations—What Libraries Should Do
Economists offer a variety of recommendations to libraries based on their analyses. Unfortunately, not all of them are practical. Rather than criticize the impractical recommendations of others, the authors will see what their analysis suggests.

Because the journal pricing problem stems from the existence of monopoly power, the authors first considered ways of dealing with such power. Society has several means of dealing with monopoly situations. Two of these, government ownership and economic regulation such as government-imposed price ceilings, are impractical because the federal government is not about to take over journal publishing firms or begin regulating their prices.

A third method of dealing with a monopoly is to create competition for the monopolist by finding or creating a substitute product. This could involve finding ways to meet the demand for particular journal articles without having the library buy the journals. A few colleges appear to be purchasing alternative journals instead of those with the highest prices, but this is not a feasible solution for research libraries. An increasing number of institutions are ordering individual photocopies of articles from the more expensive journals as needed, through services provided by CARL Uncover and First Article, among others. However, commercial journal publishers could set the copying fees at levels that will maximize their profits, making potential long-term savings from this alternative problematic.

Publishers should be told when they lose customers as a result of their high prices. They must realize that, despite monopoly power, demand is relatively elastic as prices rise. If a subscription is cancelled because of price or budgetary problems, publishers should be informed as to the reason, even if it is done with a form letter. Some researchers believe that publishers may finally be starting to receive this message from the “massive serials cancellations programs undertaken by research libraries” in the United States over the past few years.44

In a study commissioned by the Association of Research Libraries (ARL), ECS suggested that professional associations create new journals as nonprofit alternatives to commercial publishers and that these associations and the ARL should also encourage low-price profit-seeking publishers to create additional journals.4546 Others have called for universities as well as learned professional associations to enter the journal publishing business.47 Many economists believe that in a free market system, in an industry where excessive profits are being made, new firms will be drawn into the industry because of the strong profit incentives, even if they must overcome the considerable monopoly power of the highly profitable existing firms. That is usually true, but sometimes it takes several decades for the new entrants to gain a foothold. The authors therefore encourage the ARL to facilitate this process, and the best prospects for entry may be small established American commercial publishers who are willing to work with professional associations that can guarantee a market for their products.

ARL has, thus far, taken a slightly different approach to the journal pricing problem. In a recent collaborative effort, the Association of American Universities (AAU) and the ARL set up three task forces to: (1) study acquisition and distri-
distribution of foreign language and area studies materials; (2) develop a national strategy for managing scientific and technical information; and (3) study intellectual property rights in an electronic environment. Those task forces, recognizing the growing monopoly power of a few European publishers and the extent to which they have a captive university market, concluded that additional competition must be “injected” into the journal market. Task force members believe that the advent of electronic journals and databases provides new opportunities for low-cost journal market entry by professional societies and university presses with electronic links to regional and national distribution centers where all scholars may access any journals from their desktop computers.

Closely tied to these suggestions, the task forces noted, is the need to change copyright practices so that the federal government, universities, and faculty members somehow retain copyright control over the work that they either fund or do themselves. This is in contrast to the current practice of signing over copyright ownership to the journal publishers. The task forces recognized that, as noted above, the lower costs of electronic publishing will not be passed on as lower prices to subscribers by commercial publishers unless the competitive situation is changed. However, as the task forces also noted, such changes will require cooperation among scholars, universities, and the federal government, who will have to present a united front in order to force publishers to give up copyright control of journal articles. These changes may also require modification of university scholarship requirements for tenure and promotion. Tenure and promotion committees must be willing to recognize fully publications in the new journals, both electronic and print, that university presses and others are being encouraged to start. Gaining such total cooperation, if that is possible, would require a great deal of work by a powerful central coordinating organization, as the task forces recognized. This idea essentially encompasses another economic solution to the monopoly problem—bilateral monopoly.

Long employed by union organizers, bilateral monopoly consists of meeting monopoly power with opposing monopoly power. Industrial organization economist H. Craig Petersen, in an excellent study of factors affecting journal pricing, states, “Another group that could influence journal pricing is library associations.” He then suggests that “at the very least, publishers whose prices are significantly higher than charges for comparable publications should be asked to justify their pricing practices by providing detailed information on costs.” The authors concur, but take the suggestion further. As organizations representing the customers who are discriminated against, the ALA and ARL, with the help of the AAU, can act as monopoly buyers, developing cooperative purchasing arrangements (which has begun to occur through other organizations), as suggested by Chressanthis and Chressanthis, or employing threats of collective action such as boycotts against the publishers who are the greatest offenders in setting high or discriminatory prices that they cannot or will not attempt to justify. The ECS study suggests that the ARL should act as a lobbyist to find new publication channels. That is not much different from putting the squeeze on offending publishers directly. The ARL-AAU task force reports have similar implications. In essence, carrying out the recommendations hinges on the coordination of a massive cooperative effort by scholars, government, universities, and university presses that amounts to the formation of a united front or effective monopoly to wrest control of copyrights and scholarly publication from a small group of commercial publishers. This solution could work, but the obstacles are many, not the least of which is the magnitude of the necessary coordina-
tion effort and the need to change the academic prestige and reward system to include electronic, and other less expensive journals.

As noted above, the second problem characteristic in the journal market is "third-party payment." The demanders and users are not paying for the journals that they request and use. In dealing with that problem, the following suggestion will have positive results ultimately. Give the researchers who request and use the journals an economic incentive to care about the prices and the library expenditures in this area. Force them to deal with the library's budget problems by providing a budget for journals in their disciplines and supplying them with a list of subscriptions and prices. Let them help to choose which journals they want within the library's budget constraint. If they refuse involvement, library admin-

Price discrimination is not illegal, but neither are consumers' attempts to avoid or combat it. Price discrimination and rapidly rising prices are breeding ill will among library administrators, and it might be helpful to their cause if such feelings were shared by the faculty who read and publish in the journals.

istrators will make the decisions and faculty members will have few grounds for complaint. The tighter the budget constraints, the more interested they should be in dealing with the problem as subscriptions are cancelled. Once again, note Petersen's findings that "rapid price increases are not inevitable. . . ." and "If prices of certain journals become too high, scholars could use their professional associations to establish other, less expensive publications. The problem is that scholars have little incentive to do so." Jean Walstrom Haley and James Talaga, in a survey of libraries' efforts to deal with the journal price inflation problem, found that university librarians reported that shifting journal selection to faculty, cancelling subscriptions in protest of price increases, and filing individual complaints with publishers were thought to be the most successful remedies by those who had employed them, but few libraries had done so. Haley and Talaga also suggested attempting to negotiate prices with publishers and sharing resources among libraries.

ECS suggested involving university leaders and professional societies in this effort. The key is to provide the right incentives to all parties, the demanders as well as the publishers. Journal users must think they have a real stake in the outcome of the process. Although the effect of involving these additional parties cannot be forecast precisely, providing the correct incentives will usually result in positive outcomes, whether they be new, less expensive journals, as Petersen, ECS, and AAU-ARL suggested, or lower prices for existing journals.

In addition, consumer groups can try to counter price discrimination by changing one or more of the aforementioned six conditions necessary to its maintenance. Perhaps effective reseller markets may be established. Despite publishers' printed statements that individual subscribers may not pass their journals on to libraries for other readers, that proscription is of dubious legal validity and publishers have never tested it in court. The authors believe publishers are not anxious to test it. Illegal duplication of a product for profit is one matter. Selling or letting others use a product that you purchased is certainly another matter, and this practice has never been illegal in the United States.

Price discrimination is not illegal, but neither are consumers' attempts to avoid or combat it. Price discrimination and rapidly rising prices are breeding ill will among library administrators, and it might be helpful to their cause if such feelings were shared by the faculty who read
and publish in the journals. To that end, the ARL should continue to publish price indices and publicize the price differentials between low-priced and high-priced publishers.

Ironically, some publishers claim, and researchers acknowledge, that subscription cancellations, which appear to have sharply accelerated recently, force them to raise prices further to maintain profit margins.57-59 Although such actions are neither unheard of nor unjustified, they only succeed if the remaining demand is inelastic so that further price increases do not lead to additional cancellations.60 Such inelasticity is a further indication of monopoly power, thereby leading to the conclusion that journal publishers think that they have considerable monopoly power despite the subscription cancellations.

Summary and Conclusions

An economic analysis of the journal industry indicates that high and discriminatory prices result from the existence of monopoly power among publishers. University and library administrators can alleviate this problem in several ways: (1) by providing journal users with an incentive for keeping prices lower; (2) by encouraging library organizations and university consortia to exploit their potential monopsony (i.e., a buying monopoly) power into a bilateral monopoly situation; and (3) by attempting to create and demonstrate high elasticity of demand for journals in any way possible. Even if some degree of price discrimination is justified by consumer equity considerations, the current pricing situation is far from equitable and can be improved if publishers can be coerced to change their pricing practices. Meanwhile, efficiency and resource allocation considerations, which are usually of the utmost importance to "normative" economists (i.e., those interested in efficient use of society's resources), appear to favor holding journal prices to libraries down to levels close to marginal production cost (including a reasonable profit) in order to promote the shared usage that takes place in libraries as opposed to printing an individual copy for each user. Journal price inflation has exceeded greatly the rate of increase in the consumer price index in the past quarter century. There is evidence that the greatest extent of high markups and price discrimination is centered in a few commercial publishing firms, primarily located in Western Europe, and in a few disciplines.61-65 The pricing practices and profitability of these firms need to be explored further to determine whether there is any cost-based justification for their high prices and to develop a more complete understanding of the journal price problem, for recent data show that the problem is not simply going to disappear.66 Nor should society expect that to happen.

Notes

7. ECS, "A Study of Trends in Average Prices and Costs of Certain Serials over Time."
10. Lewis, "Economics of the Scholarly Journal"
11. ECS, "A Study of Trends in Average Prices and Costs of Certain Serials over Time."
18. Joyce and Merz, "Price Discrimination in Academic Journals"
21. Chressanthis and Chressanthis, "Publisher Monopoly Power and Third-Degree Price Discrimination of Scholarly Journals."
22. Joyce and Merz, "Price Discrimination in Academic Journals"
34. AAU in collaboration with the ARL, Reports of the AAU Task Forces.
37. Ketcham and Born, "Projecting Serials Costs."
The citation for the quote from Robert Maxwell is Global Business, 41+ (spring 1988).
43. Machlup, "Publishing Scholarly Books and Journals."
44. Ketcham and Born, "Projecting Serials Costs."
45. ECS, "A Study of Trends in Average Prices and Costs of Certain Serials over Time."
46. Ibid.
48. AAU in collaboration with the ARL, Reports of the AAU Task Forces.
49. Ibid.
50. Petersen, "The Economics of Economics Journals."
51. Ibid., 180.
52. George A. Chressanthis and June D. Chressanthis, "Publisher Monopoly Power and Third-Degree Price Discrimination of Scholarly Journals," 13-36.
53. ECS, "A Study of Trends in Average Prices and Costs of Certain Serials over Time."
56. ECS, "A Study of Trends in Average Prices and Costs of Certain Serials over Time."
58. ESC, "A Study of Trends in Average Prices and Costs of Certain Serials over Time."
59. Ketcham and Born, "Projecting Serials Costs."
60. Petersen, "The Economics of Economics Journals," 176-81.
61. Astle and Hamaker, "Pricing by Geography."
62. ECS, "A Study of Trends in Average Prices and Costs of Certain Serials over Time."
63. Petersen, "Variations in Journal Prices."
64. Petersen, "The Economics of Economics Journals."
65. AAU in collaboration with the ARL, Reports of the AAU Task Forces.
66. Ketcham and Born, "Projecting Serials Costs."
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A Citation Analysis Study of Library Science: Who Cites Librarians?

Terry Meyer and John Spencer

Are librarians the only ones who read and cite articles published in library science journals? Research reported here shows that disciplines citing library science articles include computer science, medicine, psychology, the social sciences, and general sciences. This study's methodology involved using Social SciSearch on DIALOG to analyze citations to twenty-four library science journals over a twenty-year period. The authors identified the nonlibrary science fields or disciplines that cited articles published in the library journals included in this study by using the journal subject categories on DIALOG. Although citations from other fields are higher than previous studies indicate, comparison with other fields in the social sciences shows that library science is not commanding citations at the level of the more developed fields.

Although library science has developed a body of professional and scholarly literature in the United States over the past century, librarianship is primarily considered an applied discipline. Even though the work of many librarians brings them regularly in contact with other disciplines, the reverse is not true. Other disciplines do not often refer to library science in their literature, and library science is often considered an insular field that has had limited impact on the development of other disciplines. To explore whether scholars outside the field of library science cite articles from library science journals, this study presents research data that use citation analysis to identify which fields cite the literature of library and information science. Our primary research question is: Do scholars from other fields read, discuss, and cite library literature?

Literature Review

Researchers such as Robert Grover, Jack Glasier, and Maurice Tsai, who found little theoretical development and analysis in library literature, believe that the field of library and information science is relatively young in comparison with other fields. They base their assessment on the observation that the field lacks articles which emphasize theoretical analysis and that research in library and information science is very pragmatic and narrow in focus, with little attempt to generalize the results to a broader theoretical context. They concluded that the level of theoretical research in library and information science is at the substantive level primarily, as researchers have less interest in stating formal theories for verification through more rigorous research methodology.

Other researchers have analyzed the characteristics of the literature of library

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and information science. For example, Christine E. Thompson used citation analysis to compare the literature of information science and the literature of library science against three norms: 1) the research front index, 2) number of journal citations, and 3) number of citations per article in order to detect any differences that might exist between the two subsets of literature. Thompson found that the discipline could be considered a "medium" science, and of the two subsets, information science would be more of a "hard" science than library science literature when measured against an index developed by Derek de Solla Price. Thompson recommended that further study is needed before drawing any conclusions regarding the differences in the two subsets.

When looking at the amount of scholarly exchange between library science and other fields, researchers have discovered a limited impact. For example, Ronald E. Rice and Gregory A. Crawford, in reviewing the scholarship cited by library science articles and communication articles, found that library and information science cites far more communication articles than vice versa. They found that there is only a small amount of exchange of research on specific topics between the disciplines of communication and library and information science. The authors and articles that "cross the formal boundaries of these two disciplines are concerned primarily, though not exclusively, with more pragmatic issues centered around telecommunications policy, research and theory on computer-mediated communication systems and general bibliometric analyses of program disciplinary evaluation." Other research raised concerns about the pattern of self-citation within the field. In looking at the characteristics of the journal literature of bibliographic instruction, James K. Bracken and John Mark Tucker found that about 74 percent of the citations in articles on bibliographic instruction referred to sources in the field of library science, while about 26 percent cited sources outside the field. Comparing their results to other research efforts reinforced their opinion that library literature is prone to self-citation. Likewise, Jeffrey N. Gatten's study of interdisciplinary research paradigms in sociology and library science concluded that a research discipline (e.g., sociology) and an applied discipline (e.g., library science) do not share an interdisciplinary paradigm even when addressing the sociological aspect of libraries in journal articles. Gatten determined that researchers in library science demonstrated "a strong tendency to cite library science's own body of literature" and that research reported in the library science literature does not often cite relevant research from other disciplines.

Some researchers used citation analysis to understand the developmental stage of a discipline, that is, to clarify whether a field is more or less influential than other fields. One researcher, Clement Y. K. So, employed data from the Journal Citation Reports of the Social Science Citation Index and identified characteristics of eleven social science fields, including information science. When looking at their impact on other fields, So concluded that both information and library science and communication are young and less influential fields. Information/library science has the lowest other-field affinity factor of .08 while the more developed fields usually have an other-field affinity of about .25, meaning that one-fourth of the citations they command are from outside the field. So's data also show that information science has the lowest number of citations per article, which So concludes is related to the applied character of the field, compared with fields such as sociology and psychology which are more theoretical or "scholarly" in orientation. However, this study is constructed to look more broadly at the impact that in-
formation and library science has on other disciplines. In this study, the authors use the terms *information* and *library science* interchangeably. Useful methods for distinguishing between the two subfields do not exist, and there is substantial overlap in the definitions for them. From previous research, such as those examples mentioned in the literature review, the authors know that librarians who publish in library science journals tend to cite library literature. But what about scholars in other disciplines? Do they cite relevant library literature in their references? Researchers are apt to point out that further studies are needed to inform the profession on the "intellectual isolation" that is apparent to many who have studied the discipline. This study is an attempt to determine what kind of impact library and information science articles have on scholars from other disciplines who are publishing in journals of other fields. The research goal of this study is to clarify and understand the extent to which authors in other fields cite articles published in library and information science journals.

**Methodology**

**Data Source**

This study used data from Social SciSearch on DIALOG, which included over twenty years of citation analysis (1972–1994). In addition to producing the citation indices annually, the Institute for Scientific Information (ISI) also produces the *Journal Citation Reports* (JCR), which includes a number of citation measures developed by ISI. One such analysis is called the impact factor, "a measure of the frequency with which the 'average article' in a journal has been cited in a particular year." 13 Basically a ratio between the number of citations and the number of articles published, the impact factor for a specific journal is calculated by dividing the number of citations to that journal's articles for the past two years by the number of articles published in those two years. The twenty-four journals the authors selected for this study were listed in the 1992 JCR under the subject category "Information Science and Library Science," and included those journals with an impact factor of .4 or higher.

By expanding on the "cited-works" field, the authors identified varying forms of the journal title abbreviations and placed them in a set. The DIALOG database allows for searching according to journal subject category (SC = information science and library science). ISI assigns a journal subject category to each of the source journals indexed in Social SciSearch. Some journals have more than one journal subject category. To find the number of times a field other than information and library science cited a journal article required a DIALOG search of several steps for each journal. For each journal title, the method for gathering the data from DIALOG was as follows below.

First, the authors identified the source journal articles in Social SciSearch on DIALOG that had the subject category "Information Science and Library Science." They identified over 85,000 articles with the information science and library science subject category. Second, they used the Expand command for journal titles in the cited-works field. This ensured that they used a set of as many cited works as possible for each journal title. Next, the authors removed all the cited works that were in the field of library science. They did this by removing all the articles whose journal subject category was "Information Science and Library
TABLE 1
Journal Citation Analysis

<table>
<thead>
<tr>
<th>Journal Title</th>
<th>JCR Impact Factor</th>
<th>Ulrich's Circulation</th>
<th>Non-LS cites/LS cites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ann. Rev. Info. Sci. &amp; Tech.</td>
<td>1.53</td>
<td>N/A</td>
<td>28/225</td>
</tr>
<tr>
<td>Bull. of Med. Lib. Assoc.</td>
<td>.48</td>
<td>6,300</td>
<td>89/554</td>
</tr>
<tr>
<td>C&amp;RL</td>
<td>1.47</td>
<td>13,000</td>
<td>45/989</td>
</tr>
<tr>
<td>Database Journal</td>
<td>.53</td>
<td>4,500</td>
<td>105/662</td>
</tr>
<tr>
<td>Info. Processing &amp; Management</td>
<td>.80</td>
<td>1,500</td>
<td>142/621</td>
</tr>
<tr>
<td>Info. Tech. &amp; Libraries</td>
<td>.43</td>
<td>6,800</td>
<td>14/238</td>
</tr>
<tr>
<td>International Classification</td>
<td>.57</td>
<td>2,000</td>
<td>13/161</td>
</tr>
<tr>
<td>Interlending &amp; Doc. Supply</td>
<td>.50</td>
<td>1,200</td>
<td>7/58</td>
</tr>
<tr>
<td>Journ. of Acad. Libr.</td>
<td>.58</td>
<td>3,000</td>
<td>22/570</td>
</tr>
<tr>
<td>Journ. of Amer. Soc. for Info. Sci.</td>
<td>1.007</td>
<td>5,800</td>
<td>409/1,473</td>
</tr>
<tr>
<td>Journ. of Documentation</td>
<td>1.00</td>
<td>3,500</td>
<td>159/974</td>
</tr>
<tr>
<td>Journ. of Info. Sci.</td>
<td>.49</td>
<td>3,500</td>
<td>104/562</td>
</tr>
<tr>
<td>Lib. Acquis.: Pract. &amp; Thoery</td>
<td>.85</td>
<td>5,300</td>
<td>1/109</td>
</tr>
<tr>
<td>Library &amp; Info. Sci.</td>
<td>1.71</td>
<td>1,750</td>
<td>1/7</td>
</tr>
<tr>
<td>Lib. &amp; Info. Sci. Research</td>
<td>.55</td>
<td>650</td>
<td>18/230</td>
</tr>
<tr>
<td>Library Journal</td>
<td>.57</td>
<td>24,000</td>
<td>59/1,245</td>
</tr>
<tr>
<td>Library Quarterly</td>
<td>.77</td>
<td>2,600</td>
<td>16/207</td>
</tr>
<tr>
<td>Lib. Res. &amp; Tech. Services</td>
<td>1.27</td>
<td>9,600</td>
<td>1/253</td>
</tr>
<tr>
<td>Online Review</td>
<td>.56</td>
<td>5,500</td>
<td>91/1,110</td>
</tr>
<tr>
<td>Program: Auto. Lib. &amp; Info. Sys.</td>
<td>.41</td>
<td>1,000</td>
<td>4/118</td>
</tr>
<tr>
<td>RQ</td>
<td>.48</td>
<td>7,100</td>
<td>33/1,047</td>
</tr>
<tr>
<td>Scientometrics</td>
<td>.63</td>
<td>N/A</td>
<td>496/760</td>
</tr>
<tr>
<td>Serials Librarian</td>
<td>.82</td>
<td>1,500</td>
<td>14/194</td>
</tr>
<tr>
<td>Telecommunications Policy</td>
<td>.43</td>
<td>N/A</td>
<td>60/80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,931/12,447</td>
</tr>
</tbody>
</table>

Science." The authors were left with a set of articles cited by authors in disciplines other than library and information science. Finally, they ranked the remaining citations by journal subject categories using the Rank command on DIALOG, thus providing a listing of subject categories and the number of citations within each subject. As a sampling technique, this methodology provides the subject category for those citations that are not in the field of information and library science.14

Results
The data collection (see table 1) resulted in an analysis of 14,378 citations that referenced articles published in the twenty-four journal titles selected for this study. Of these citations, 12,447 (86.6%) appeared in library and information science journals, while 1,931 citations (13.4%) appeared as references in articles in journals from other fields. The authors' primary interest in this study is to clarify which fields are represented by the citations (13.4%) from nonlibrary science journals.

Analysis of the fields that cited articles in the library and information science journals showed that the journals used in this study represented ninety-four distinct subject categories. Four subject categories had over one hundred citations: (1) computer applications and cyberte-
ics, (2) education and educational research, (3) ergonomics, and (4) psychology. Nine subject categories had between fifty and one hundred citations each: (1) business, (2) chemistry, (3) communication, (4) management, (5) medicine, (6) physics, (7) planning and development, (8) social science (interdisciplinary), and (9) sociology. The authors created four additional subject categories by analyzing and combining subject categories: (1) arts and humanities, (2) economics, (3) engineering/mathematics, and (4) general science. Twenty subject categories had between ten and fifty citations, and the remaining sixty-two subject categories had fewer than ten citations. Twenty subject categories had only one citation. They combined the journal subject categories where it was appropriate and consolidated them under broader subject categories.

Figure 1 shows the journal subject categories with a bar graph representing the number of citations for each journal subject category. The chart includes the percentage of total citations in parentheses at the end of each bar graph. Computer applications and cybernetics journals have the highest percentage (15.5%) of citations to the twenty-four library science journals, with social science journals next (11.6%), followed by medicine (10.2%), psychology (9.9%), and general science (9.9%). We cannot determine from our study exactly why scholars in these fields cite library and information science journal articles, but these fields are linked in some way to library and information science.

Three journals received about five percent each of all the citations from nonlibrary science journals: Bulletin of the Medical Library Association, Online, and the Journal of Information Science.

Figure 2 illustrates which journals in library and information science were cited by nonlibrary science fields. Two journals stand out: Scientometrics and the Journal of the American Society for Information Science. Between the two of them, they received 44.9 percent of the citations from nonlibrary science fields. Scientometrics ranks first in terms of the number of citations from other fields (23.3%). Scientometrics, published in Amsterdam, is defined in Ulrich's as "an international journal for all quantitative aspects of the science of science, communication in science and science policy." In reviewing the tables of contents over the past two years, most articles in Scientometrics are about science publishing, primarily concerning topics related to how scientists communicate and how scientific information is distributed. The Journal of the American Society for Information Science ranks second in terms of citations from others fields, primarily computers, engineering, ergonomics, general science, medicine, psychology and the social sciences. Defined in Ulrich's as "a forum for discussion and experimentation in the theory and practice of communicating information," this journal features articles on operations research, automation applications, communications, and computer technology.

Three journals received about five percent each of all the citations from nonlibrary science journals: Information Processing Management (8.6%), The Journal of Documentation (8%), and Database (6.2%). Three journals received about five percent each of all the citations from nonlibrary science journals: Bulletin of the Medical Library Association, Online, and the Journal of Information Science. The other sixteen journals in this study received a total of 18.3 percent of the citations from nonlibrary science fields, with no journal receiving more than 3.3 percent of the nonlibrary science citations.

Table 2 indicates the journal subject categories that cited the twenty-four library and information science journals, along with the actual number of citations to each journal. For example, journals in fields such as the social and general sciences,
FIGURE 1
Fields Citing Library Science Journals

- Economics 1.8%
- Arts & Humanities 2.1%
- Sociology 2.5%
- Communication 3.0%
- Chemistry 3.2%
- Business 3.4%
- Physics 3.4%
- Urban Studies 3.8%
- Engineering & Math 4.0%
- Management 4.6%
- Ergonomics 4.6%
- Education 6.5%
- General Science 9.9%
- Psychology 9.9%
- Medicine 10.2%
- Social Sciences 11.6%
- Computers 15.5%
FIGURE 2
Library Science Journals Cited by Nonlibrary Science Fields
### TABLE 2
Citations from Nonlibrary Fields to Library Science Fields

<table>
<thead>
<tr>
<th>Arts &amp; Humanities</th>
<th>B MED LIBR ASSOC</th>
<th>COLLE LIBR</th>
<th>DATABASE</th>
<th>INFORM PROCESS MANAG</th>
<th>INT LIBR</th>
<th>J ACAD LIBR</th>
<th>J AM SOC LIBR</th>
<th>J INFORM SCI</th>
<th>J DOC</th>
<th>LIBR ACQUIS PRAC'TH</th>
<th>LIBR AGR SCI</th>
<th>LIBR AGRI SCI</th>
<th>LIBR J</th>
<th>LIBR QUART</th>
<th>LIBR RESOU TECH SER</th>
<th>ON-LINE</th>
<th>PROGRAM AUTOM LIBR</th>
<th>R Q</th>
<th>SCIENTOMETRICS</th>
<th>SERIAL LIBR</th>
<th>TELECOMM POLICY</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Business</td>
<td>0</td>
<td>1</td>
<td>0</td>
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30 College & Research Libraries

January 1996
psychology, and urban studies published articles that cited *Scientometrics* more often than any other journal in our sample. The second highest cited journal, the *Journal of the American Society for Information Science*, had citations in journals from the fields of computers, engineering, ergonomics, general science, medicine, psychology, and the social sciences. Two journals that feature articles on computers in libraries, *Online* and *Database*, are also heavily cited journals. The two journals that have the highest circulation, *College & Research Libraries* (circulation 13,000) and *Library Journal* (circulation 24,000), were not cited as often.

Nonlibrary science fields also cited other journals to a significant extent. Computer and ergonomics journals had articles that cited *Information Processing Management*, and computer and psychology journal articles cited the *Journal of Documentation*. The highest number of citations to articles in *Database* were from computer journals (24%), with citations from management journals second (17%). The *Bulletin of the Medical Library Association* had a significant number of citations from journals in the medical field. Computer science (20%), medicine (16%), and chemistry (13%) cited articles published in *Online* more than other fields.

In analyzing the citations from key fields to library science journal articles, the authors found certain journals cited significantly more than others. For example, table 2 shows that computer journals cited articles in the *Journal of the American Society for Information Science* (28.8%), *Information Processing Management* (18.2%), and the *Journal of Documentation* (13%). Journals in the social sciences cited articles in *Scientometrics* (31%), the *Journal of the American Society for Information Science* (18.2%), and the *Journal of Information Science* (9.2%). Medical journals cited articles in the *Bulletin of the Medical Library Association* (25.3%), the *Journal of the American Society for Information Science* (17.7%), and *Scientometrics* (15.1%).

**Discussion**

Analysis of the citations to the twenty-four journals revealed that other fields cited articles in two journals, *Scientometrics* (23.3%) and the *Journal of the American Society for Information Science* (21.6%), almost as many times as the rest of the journals in this study. However, eliminating the two journals from table 2 would not significantly alter the ranking of the fields that cited library science journal articles. Conversely, eliminating the two highest-ranked journals would significantly diminish the number of citations to library and information science journals from nonlibrary science fields. These two journals received the major portion of the citations from nonlibrary science journals (44.9%).

In analyzing which nonlibrary science fields cite library science, clearly computer journals (15.5%) are in the lead, and social science journals (11.6%) are second, followed by a cluster of three fields—medicine (10.2%), psychology (9.9%), and general science journals (9.9%). Other fields that cite articles in library science journals to a lesser extent are education, ergonomics, and management. The links between library and information science and the fields of computer science, the social sciences, medicine, and psychology are not apparent from this study. Additional research is needed to clarify what types of citations are made to library and information science journal articles.

**Conclusion**

From analysis of the data collected, the authors conclude that information and library science is commanding citations from a wide range of fields, but primarily from five fields: computers, the social sciences, medicine, psychology, and the general sciences. Approximately 13 percent of the citations to articles in library science journals come from articles published in nonlibrary science journals. In comparison to the research Clement So published in 1988, library and informa-
tion science has increased the level of its citations from other fields. So concluded that library and information science commands 8 percent of its citations from other fields. Although the increase is important to consider, library and information science has not yet surpassed the next lowest field in So’s study, language/linguistics, which commanded 15 percent of its citations from other fields. The highest field in So’s analysis is sociology with 45 percent of its citations from other fields. The increase from 8 to 13 percent over a period of time may indicate that the field is maturing and increasing its other-field affinity. Nevertheless, the field has a long way to go if library science is to become a more influential field and command one-quarter of its citations from other fields, as So found of the more developed fields.

Possibilities in terms of the development of the field of library and information science are important to consider. Specifically, research is needed to determine exactly what types of articles published in library science journals are being cited. Many library journals publish articles that are written about professional experiences and programs, for example, the “how to do it” article. Researchers need to ask if this type of article decreases the likelihood of citations from other fields. Additionally, librarians rarely publish articles framed in a theoretical perspective that are considered more generalizable research articles. Researchers need to find out whether this means that library science publications are less likely to be cited by other fields, particularly those fields that have a strong theoretical base, such as psychology. Generally, psychology is considered the core scholarly field in the social sciences, and other fields draw upon its theoretical development. Research is needed to determine how much library science draws upon the field of psychology and related social sciences.

One purpose of research is “to verify and generate theory for practitioners in the library and information professions,” according to Grover, who recommended that textbooks and research methods classes in library and information science need to encourage the examination and verification of relevant theories and methodologies from other disciplines, especially the social sciences. In order to do this, librarians need to analyze research in other disciplines and incorporate their theoretical frameworks into the research questions for library and information science. By incorporating theoretical perspectives from other fields, librarians may be more likely to share theoretical paradigms with other fields. Furthermore, library and information science scholars should concentrate on building a theoretical foundation for the field. Fields with the strongest theoretical base are cited more often by other fields. However it is accomplished, theory building and integration of theory into research are potential ways to attract attention from other fields and possibly command more citations from other fields as a result. Nevertheless, more research is needed to clarify the link between the nonlibrary science journal articles that cite library science journal articles. What kinds of articles published in library science journals are being cited by other fields? Additional research is needed before any generalizations can be made about how library science can garner additional citations from other fields.

Specifically, research is needed to determine exactly what types of articles published in library science journals are being cited.
Notes

2. Ibid., 276.
4. Ibid., 439.
6. Ibid., 10.
9. Ibid., 583.
11. Ibid., 247.
12. Ibid.
14. In using Social SciSearch on DIALOG (File 7), only those journals that are considered source journals by ISI have been assigned a journal subject category. Some journals are assigned more than one journal subject category when they contain content which crosses disciplines. All journals without a journal subject category are ignored in this study. Likewise, books and dissertations or other types of references are excluded from this study.
16. Ibid., 3420.
17. So, “Citation Patterns of Core Communication Journals,” 247.
18. Ibid.
19. Ibid.
20. Ibid.
22. Ibid., 296.
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Theological Librarianship: Toward a Profile of a Profession

Rashelle S. Karp and Andrew J. Keck

Theology touches almost everyone at one time or another. The librarians who maintain, preserve, and disseminate theological information are critical to the perpetuation of theological study and enlightenment. However, the literature of librarianship is strangely silent on the topic of theological librarianship, and especially on issues that are unique to theological librarians—those who work with theologially or religiously focused collections or libraries that support the education and training of people preparing for the ministry.

Search of Library Literature (1984-1994) yields fewer than forty citations on the topic of theological libraries or librarians; a major review of the literature written between 1924 and 1984 on the topic cites only another twenty-five articles. Selected studies that are considered landmarks include a 1934 study of ministerial education; a 1957 study of theological education; a 1970 demographic survey of members of the American Theological Library Association (ATLA); surveys in 1971 and 1980 regarding faculty status among theological librarians; and a 1984 survey concerning unique problems facing theological librarians of the 1990s.

The literature on theological librarianship notes: (1) the need for theological librarians to acquire library, theological library, and theological professional education; (2) a paradox that theological librarians must formulate collection development policies that are not denominational but collections that are; (3) the critical role of theological librarians as preservationists and developers of special cataloging and classification schemes that provide differentiation among specialized and diverse denominational resources; and (4) definitions of theological librarians as people performing ministry and as people who provide linkages among theology, church, scholarship, education, diverse constituencies, and both scholarly and popular literature.

Methodology
Based on the literature, researchers developed a questionnaire and mailed it to the 371 American members of the ATLA listed in the ATLA Membership Directory of 1994. (Survey questionnaires are available from the authors.) Researchers received a total of 243 usable responses, yielding a response rate of 65.4 percent. They then used the SAS statistical package to manipulate coded data, and data from open-ended questions were transcribed verbatim and then analyzed to

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discern trends and patterns. Additionally, researchers matched each library represented by a respondent to its entry in the American Library Directory (online, Apr. 1995) in order to determine the proportionate representation among types of libraries (religious, college and university religious, special religious, or public).

**Results**

**Demographics**

**Libraries represented.** Respondents represented 137 religious libraries, 36 college and university (religious) libraries, 25 college and university libraries, 24 special (religious) libraries, and 3 public libraries. A little over 7 percent of the represented libraries could not be categorized.

**Personal characteristics of respondents.** The average age of respondents was forty-eight years, and the sample comprised 56.8 percent males and 43.2 percent females. A little over 14 percent of the respondents filled the post of clergy at a local congregation, and out of this group, a little under half (44.8%) received payment for their clergy work. Additionally, 34.6 percent of all the respondents indicated that they were ordained. The denominations to which respondents belonged covered a broad range of Christian sects, with the most represented denominations including Roman Catholic, Presbyterian (USA), and Episcopal (see table 1). A respondent on average had worked 13.5 years as a theological librarian.

As for respondents’ personal theological positions, 39.4 percent indicated a liberal position, 27.1 percent indicated a moderate position, and 33.5 percent indicated a conservative position. In modest contrast, when asked to rate the theological positions of their parent institutions, 29.2 percent of the respondents indicated a liberal position, 25.4 percent indicated a moderate position, and 40.2 percent indicated a conservative position; 5.1 percent indicated that their institutions had no theological position.

In terms of involvement in the activities of their local congregations, 11.3 percent of the respondents indicated that they were not involved in the religious activities of their local congregations, and 23.6 percent indicated that they were not involved in the social activities of their local congregations. A little over 65 percent indicated moderate levels of involvement in the religious activities of their local congregations, and 66.7 percent indicated moderate levels of involvement in the social activities of their local congregations. Finally, 23.4 percent indicated that they were
very involved in the religious activities of their local congregations, and 9.7 percent indicated that they were very involved in the social activities of their local congregations. Respondents had mostly positive feelings about their local congregations (79.7%) and the denominations to which they personally belonged (68.7%).

Employing libraries' characteristics. In terms of staffing, the average number of full-time paid library staff at institutions of responding librarians was seven; the average number of part-time paid library staff was six; and the average number of full or part-time library volunteers was one. The majority of the libraries employed between one and eight full-time paid staff, between zero and six part-time paid staff, and no volunteers. Respondents indicated, on average, that their current levels of staffing were moderately adequate. Similarly, on average, respondents indicated that their current levels of funding were moderately adequate.

When asked what three positions they would most like to add to their library, respondents indicated that their top priorities included reference, cataloging, and automation professionals (see table 2). Degrees considered to be the most important credentials for those filling these positions included a master of library science (MLS), a bachelor's degree, and a theology degree (see table 3). Finally, respondents indicated that the areas which were most in need of funding at their libraries included books and journals, electronic resources, and automation of library processes (see table 4).

Academic status of librarians. Faculty status only was held by 23.1 percent of the respondents, 26 percent had administrative status only, 25.6 percent held a combination of both faculty and administrative status, and 25.2 percent held a rank other than administrative or faculty status. The types of rank identified by those who held other than administrative or faculty status included paraprofessional or staff, academic, or professional (but not eligible for tenure); faculty (but not eligible for tenure, sabbaticals, or faculty vacation schedules); adjunct faculty (without voting privileges); faculty (but without rank or tenure); faculty (but for the calendar year with salary adjustments); parish-based rank; permanent staff; professional/technical staff; librar-

### TABLE 2

Recommended Augmentations of Library Staff (n=588)

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<th>Identified Positions</th>
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<td>Public Service/Reference Professional</td>
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<td>Cataloging Professional</td>
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<td>Technical Services Librarian</td>
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<td>Administrative Assistant (especially for nights, weekends, a/v and office)</td>
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TABLE 3
Recommended Degrees for Library Staff
Augmentation (n=549)

<table>
<thead>
<tr>
<th>Recommended Degrees</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master’s of Library Science</td>
<td>248</td>
<td>45.1</td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>109</td>
<td>19.8</td>
</tr>
<tr>
<td>Theology Degree - Master’s</td>
<td>51 (7.0%)</td>
<td>12.7</td>
</tr>
<tr>
<td></td>
<td>Bachelor’s</td>
<td>19 (2.6%)</td>
</tr>
<tr>
<td>Master’s of Divinity</td>
<td>42</td>
<td>7.6</td>
</tr>
<tr>
<td>Bachelor’s of Science in Information Science</td>
<td>29</td>
<td>5.2</td>
</tr>
<tr>
<td>High School Diploma</td>
<td>19</td>
<td>3.4</td>
</tr>
<tr>
<td>Second Master’s (history, music)</td>
<td>15</td>
<td>2.7</td>
</tr>
<tr>
<td>Doctorate</td>
<td>8</td>
<td>1.4</td>
</tr>
<tr>
<td>Master’s of Religion</td>
<td>3</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Master of Theological Studies</td>
<td>3</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Conservation Degree</td>
<td>3</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

Salaries. Over half of the respondents (53.1%) reported salaries between $22,501 and $37,500 per year.26 None of the respondents perceived their salaries to be outrageously higher than they should be, but 7.5 percent did perceive them to be more than reasonable, and 52.2 percent rated their salaries as reasonable. A little over 35 percent believed them to be lower than they should be, and 4.2 percent believed their salaries to be outrageously lower than they should be. The majority of respondents indicated that their salaries were reasonable or slightly lower than reasonable.

Over half (70.4%) of the respondents indicated that, theoretically, theological schools should provide a mix of professional education and academic education.

In comparing their salaries with faculty at their institutions, respondents indicated, on average, that their salaries were slightly higher. In contrast, the majority of respondents indicated that their salaries were lower than the salaries of administrators at their institutions.

Degrees held by library staff. The average number of library staff per library holding an MLS degree only was two; the average number of library staff per library holding only a theological degree was one. In addition, the average number of library staff per library holding both an MLS degree and a theological degree was one. In terms of sheer numbers, the most represented postbaccalaureate degree was the MLS, followed by an MLS plus a theological degree, and, lastly, theological degrees only.

Professional degrees most often held by the respondents included: a MLS (88%), master of divinity (39%), doctor of philosophy (17%), master of arts in religion (16%), master of theological studies (9%), master of the science of theology (6%), and doctor of ministry (1.6%). Other degrees noted by 23 percent of the respondents included the certificate in archives administration, master of arts, master of business administration, master of church music, master of theology, bachelor of sacred theology, sacred theologiae lector or licentiatus, master of arts in Christian religion, master of theology, master of religious education, master of science, master of education, master of philosophy, doctor of canon law, master of sacred music, master of religious education in missions, licentiate in philosophy, doctor of the science of theology, master of Christian spirituality, certificate of advanced studies in library science, and the MLS. Analysis of the universities at which respondents obtained their degrees indicated tremendous variety; no single university emerged as more representative than any other.
Attitudes of Respondents Regarding Their Parent Institutions, Theological Librarianship, and Ministry

Attitudes toward parent institutions. The majority of the respondents (89.9%) indicated that they held neutral or positive feelings about their parent institutions, and overwhelmingly indicated the following reasons for their responses:
- commitment and support by faculty and administration for the goals of high-quality education and library service;
- congruence between respondents' personal philosophies and their institutions' missions related to ministry, theological education, and spiritual ethos; and
- collegiality among faculty.

Other reasons frequently cited included quality and enthusiasm of students and faculty, visionary leadership, diversity within the institution, humane treatment of employees, and the librarians' ability to affect institutional decision making. Respondents who held mostly negative feelings about their parent institutions (10.1%) indicated difficulties keeping up with librarianship, theology, and technology; sexism; disadvantages of those without clergy degrees; poor leadership; lack of support for the library; and lack of congruence between respondents' personal philosophies and their institutions' missions and goals related to theology and denominational focus.

Beliefs about the purpose of a theological school. Over half (70.4%) of the respondents indicated that, theoretically, theological schools should provide a mix of professional education and academic education; 21.3 percent believed that theological schools should focus on professional; and 8.3 percent indicated that theological schools should focus on academic education. When asked about the main purpose of the theological school supported by their library, 50 percent indicated that their institution provided a mixture of academic and professional education; 12.9 percent indicated a focus on academic education; and 37.1 percent indicated a focus on professional education.

Perceptions about the positives and negatives of theological librarianship. Respondents overwhelmingly indicated the following positive attributes of working as theological librarians (summarized by authors):
- the theological and spiritual focus of their work and the environment in which they worked;

### TABLE 4
Recommended Areas for Library Funding Augmentation (n=561)

<table>
<thead>
<tr>
<th>Recommended Areas</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Books/Journals</td>
<td>151</td>
<td>26.9</td>
</tr>
<tr>
<td>Electronic Resources</td>
<td>120</td>
<td>21.3</td>
</tr>
<tr>
<td>Automation of Library Processes</td>
<td>110</td>
<td>19.6</td>
</tr>
<tr>
<td>Technical Services/Processing</td>
<td>33</td>
<td>5.8</td>
</tr>
<tr>
<td>Facilities (shelving, building expansion, off-site storage)</td>
<td>32</td>
<td>5.7</td>
</tr>
<tr>
<td>Equipment (fax, PC/CD-ROM workstations, microform readers, equipment upgrades and replacements, furniture)</td>
<td>28</td>
<td>4.9</td>
</tr>
<tr>
<td>Preservation/Conservation</td>
<td>24</td>
<td>4.2</td>
</tr>
<tr>
<td>Special Collections</td>
<td>19</td>
<td>3.3</td>
</tr>
<tr>
<td>Retrospective Conversion Cataloging</td>
<td>11</td>
<td>1.9</td>
</tr>
<tr>
<td>Salaries</td>
<td>7</td>
<td>1.2</td>
</tr>
<tr>
<td>Professional Growth/Travel</td>
<td>6</td>
<td>1.0</td>
</tr>
<tr>
<td>Microforms</td>
<td>6</td>
<td>1.0</td>
</tr>
<tr>
<td>Audiovisual Materials</td>
<td>5</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Document Delivery/ILL Postage</td>
<td>2</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Binding</td>
<td>2</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Security System</td>
<td>2</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Instructional Services</td>
<td>1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Supplies</td>
<td>1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Endowments</td>
<td>1</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>
• the perception that they were performing ministry work;
• the work of being a librarian;
• being part of a seminary community;
• the humanizing effect of their institutions’ theological focuses.

The most frequently cited negative attributes of working as a theological librarian included (summarized by authors):
• difficulties keeping up with theology, librarianship, and technology;
• lack of financial support for the library;
• poor administration of seminaries;
• low salaries;
• too much paperwork;
• lack of status, recognition, and respect;
• working in a sexist, male-dominated environment; and
• denominational and seminary politics.

Attitudes toward the importance of dealing pastorally with people. When asked about the relative importance of dealing with people in a pastoral way, 24 percent of the respondents indicated that it was not important for a theological librarian to deal pastorally with people, 23.5 percent believed it was moderately important, and 52.5 percent indicated that this type of behavior was very important. When asked whether they, themselves, dealt with patrons and colleagues in a pastoral way, 29.4 percent responded that they did not, 23.0 percent indicated that they behaved pastorally to a moderate degree; and 47.7 percent indicated that they behaved pastorally to a great degree.

Perceptions of theological librarianship as a ministry. When asked whether theological librarianship as a form of ministry, 9.8 percent of the respondents indicated that they believed their work to be a form of ministry, and 26.7 percent held a professional image of themselves as more a person involved in ministry than an information professional. In contrast, 10.2 percent of the respondents indicated that they did not perceive their work as a form of ministry and 36.2 percent held a professional image of themselves as more an information professional than a person involved in ministry. Just over 37 percent of the respondents held a professional image of themselves that included both roles equally.

Perceptions of theological librarianship as a calling. When asked about whether theological librarianship was a vocational “calling,” 67.8 percent of the respondents reported that theological librarianship represented a vocational calling for them, and 32.2 percent indicated that it did not. Almost all of the respondents who indicated that theological librarianship was a vocational calling indicated that their choice to be librarians was secondary to their choice to be involved in the work of ministry; librarianship represented the vehicle through which they could pursue a higher calling.

Comparisons with other types of special librarians. It is illuminating to draw comparisons between theological librarianship and other niches in the profession, such as law and medical librarianship. Like theological librarians, law and medical librarians often possess a master’s degree in addition to the MLS. Additionally, law, medical, and theological librarians deal with unique ethical issues. For example, job satisfaction for theological librarians seems to be linked to the degree of agreement between institutional and personal theological/ethical belief systems. Medical and law librarians must deal with ethical issues related to the nature of the information with which they work and the dilemma that, although the library code of ethics promotes open access to all information, irresponsible dissemination of medical and legal information can harm more than help. Thus, for medical and law librarians, professional ethics also come into conflict with personal beliefs.
Finally, like theological librarians, law and medical librarians display a tendency to view their work as a calling rather than a profession, believing that through providing crucial information, they are aiding patients and clients as much as the physicians and lawyers themselves. This type of attitudinal environment may contribute to special librarians’ beliefs that they “make a difference.” And perhaps because of these feelings, job satisfaction is high among law, medical, and theological librarians. However, researchers note that burnout often occurs when reality consistently falls short of the ideals the librarian wishes to believe.

Conclusions and Suggestions for Further Research
The present research indicates that Christian theological librarians working in religious or college or university religious libraries: (1) are professionally and spiritually fulfilled; (2) hold theological belief systems that mirror those of their parent institutions; (3) believe their work to be a form of ministry; and (4) identify theological librarianship as a calling. The research also indicates that the theological and spiritual focus of theological librarians’ work is an integrated and important component of their attitudes toward theological librarianship. However, many questions still remain from the research.

It would be helpful to explore more fully respondents’ comments regarding the positives and negatives of theological librarianship. For example, how prevalent are these perceptions, and how do they contribute to the professional image of theological librarians? In addition, must a theological librarian have a theological degree in order to meet the needs of her or his patrons adequately?

Other interesting potential areas to investigate are the role of nonlibrarians/paraprofessionals within theological libraries, or the extent to which theological librarians’ professional images reflect those of librarians working in other types of special libraries. Finally, the present research provides information about how Christian theological librarians view their work. However, more information is needed about the ways in which non-Christian theological librarians view the profession of theological librarianship.

The research also indicates that the theological and spiritual focus of theological librarians’ work is an integrated and important component of their attitudes toward theological librarianship.

Notes


25. Categories are based on identifications in the American Library Directory.

26. It should be noted that the questionnaire did not specifically ask for "cash salary" as opposed to "cash value" of salary. Therefore, some reported salaries may be higher, especially for respondents who also receive housing and food as part of their total compensation package.


30. Ibid.


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Reference Communication: Commonalities in the Worlds of Medicine and Librarianship

Rachael Naismith

Communication between physician and patient is similar to communication between librarian and the library user in many ways. Reference and medical interviews constitute an effort on the part of the professional to both assess an individual's needs and explain a system that may seem complex and new to that individual. A series of issues is discussed, from the standpoint of both the physician's office and the reference desk. This paper presents a series of communication issues and outcomes, describing each as it applies to the physician's office and the reference desk. Avenues for improving communication are suggested.

What we have here is a failure to communicate." This famous line from the movie Cool Hand Luke states a problem that is basic to human interaction. What are the results of a failure to communicate? The reference interview is an arena in which communication failure can have a powerful negative effect on results. The medical interview is another such arena, one in which researchers have studied the results of communication failure in detail. These published results fall under the categories of recall, compliance, medical outcome, and satisfaction. In order that librarians can learn from experts in another field, this paper examines the question of communication problems through a comparison of the reference interview with the medical interview. I want to note that after this article was accepted for publication, a related article appeared in print, Carolyn Radcliff's "Interpersonal Communication with Library Patrons: Physician-Patient Research Models." Radcliff's article offers additional insight into a number of the concepts discussed here.

In the aspect of communication, the relationship between librarian and library user shares certain commonalities with that of physician and patient. Reference and medical interviews entail both finding out information and giving out information. The interviewer often begins by knowing little or nothing about the interviewee's problem, situation, or background. The physician and librarian typically have a limited amount of time to put a person at ease and ascertain his or her

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needs, which the person may obscure, hide, omit, or have difficulty expressing.

After the complex task of question negotiation, the person's needs must be matched with the resources at hand, or the person referred elsewhere. To impart information, both physician and librarian are often faced with the task of explaining a complex system to people who may lack their specialized knowledge. In his renowned article on question negotiation, Robert Taylor calls the reference interview one of the most complex acts of human communication. In a description that can be applied to the medical interview as well, he writes, "In this act, one person tries to describe for another person not something he knows, but rather something he does not know." 2

The main focus of this paper is on the physician's or librarian's attitude and behavior rather than that of the patient and library user. Because of space limitations, nonverbal communication is not discussed. The format of this paper is to discuss a series of communication issues and outcomes, describing each as it applies to the physician's office and the reference desk.

A Failure to Communicate
An examination of medical literature for the past twenty-five years reveals a wealth of research on the problems inherent in the communication between physician and patient. Library literature also reveals a similar emphasis on the reference interview. One recent article discussed the physician-patient communication process in terms of its relevance to librarians, but the authors admit it was a limited review and cited no library articles. 3

In contrast to the Plain English movement, which calls for medical and legal communications to be made comprehensible to the layperson, there seems to be no comparable grassroots movement for changes in the way librarians communicate with users. This could be because librarians are doing just fine at communicating with library users. However, the number of articles dealing with the reference interview by librarians themselves and the number of recent articles on the failure to meet user needs suggest otherwise.

The Role of Language
One way to examine interactions within the librarian-user and physician-patient dyads is to look at language. As imperfect as language is, it has the power to shape our experience of reality, even at the level of its smallest denominator—the word. Both the medical and library worlds feature many words that are considered technical language. Philip Ley discusses the problems associated with medical jargon in his comprehensive treatise on medical communication, Communicating with Patients: Improving Communication, Satisfaction and Compliance. Ley cites studies that consistently found discrepancies between physicians' and patients' interpretations of common medical terms. 4

Several physicians have called upon their colleagues to demystify medical terminology in dealing with their patients. 5 Timothy Anderson and David Helm link the use of jargon to the physician's desire to control the interaction:

Language is often used to mystify, to desexualize, to confuse and intimidate the patient, as well as to reaffirm expertise... It is through language that social realities are constructed, and through the expression of language that realities can be negotiated. The physician gains in power through his or her access to and control over the "legitimate" language of health and illness. Thus patients are urged in their presentation of symptoms and problems to recast their accounts in the appropriate nomenclature—which reinforces the
physician's mandate to determine the reality. 6

Schema Theory
Only part of the patient's comprehension problem can be explained by lack of familiarity with word meanings. A patient will interpret what a physician says in terms of the patient's own framework of ideas about illness. This concept relates to what cognitive psychologists call "schema theory." Although not using that term, John Locke gave a good description of schema theory in 1689 in his Essay Concerning Human Understanding:

To make Words serviceable to the end of Communication, it is necessary that they excite, in the Hearer, exactly the same Idea, they stand for in the mind of the Speaker. Without this, Men fill one another's Heads with noise and sounds; but convey not thereby their Thoughts, and lay not before one another their Ideas, which is the end of Discourse and Language. 7

Years later, Terry Winograd designed a model of communication (see figure 1) to illustrate schema theory. Briefly, the two participants, the speaker and the hearer, each possess a set of stored schemas, which are collections of knowledge related to a concept. The hearer considers the context of the message and compares it to existing schemas. In addition, each participant has a model of the other person, which may consist of opinions about the actual known individual or notions related to personal characteristics such as appearance, gender, occupation, and so forth. 8

If the content of the discourse seems familiar, the hearer reacts the same way he or she did before. If the hearer's schemas differ enough from those of the speaker, the intended message is likely to be received incorrectly. This theory explains in part the problems that result from patients not having the underlying medical schemas to understand the terms used by their physicians. The same can be said for library users, who often do not share the library schemas so familiar to reference librarians.

As much as librarians would like to believe that they eschew jargon, recorded reference interviews show that they use jargon in dealing with library users. A study that Joan Stein and I conducted at Carnegie Mellon University revealed that half the time library users did not understand the terms librarians used. In the study, freshmen incorrectly answered multiple choice definitions of library terms such as citation at a rate of 49 percent. Because it appears, based on this research, that library terms do not fall within library users' existing schemas, librarians must take steps to compensate for this communication barrier. 9

The Power Perspective
Literature cited throughout this article suggests that many physicians emphasize their authority, assert opinions as if they were dogma, maintain emotional distance, discourage patient collaboration, and promote poor communication with patients. Why? One reason involves a desire for control and power. 10

In general, the physician wields power in the interaction by controlling the discussion and monitoring the amount and type of information given to the patient. This is known as expert power, the use of possessed knowledge to control others. It only works so long as the expert (doctor) can keep the patient from obtaining comparable expertise. 11

If the physician retains control of the knowledge, the physician has a dominant role to the subordinate patient. As one
communication studies writer explained, "People have been socialized into expecting both minimal interpersonal rapport with most health professionals and maximal control, from them." This type of relationship, which the reader might view as paternalistic, may be common, but it may not be what the patient wants or needs.

A patient who deviates from the expected silent role may suffer consequences, according to some authors. In one hospital study entitled "Good Patients and Problem Patients," Judith Lorber addressed the issue of patients' reactions to physicians' expert power. Physicians considered patients who refuse to be submissive or to follow the
informal rules of the institution to be problem patients who place more demands on busy physicians. Lorber concluded that health professionals used medical neglect to “punish” these patients for their nonconformity.\textsuperscript{13}

Some writers have urged physicians to reexamine their use of expert power, which they claim is detrimental to physicians, to patients, and to their relationships. Judith Rodin and Irving Janis called for physicians to use, instead, “referent power,” the motivating power that derives from a person’s ability to be likeable, benevolent, admirable, and accepting.\textsuperscript{14}

The issue of power and control relates somewhat differently to the library environment. Although librarians possess specialized knowledge and therefore expert power, they are not awarded the high income that many physicians receive. Income, status, and self-image are issues that one encounters regularly in library literature.

If the use of power in an occupation is linked to the rewards of professionalism, researchers should not be surprised to see controlling behavior exhibited by reference librarians. The reference interview may serve as a means for control by the reference librarian. A number of library articles have examined one aspect of control centering on the information-versus-instruction debate. This debate, now over thirty years old, features on one side those who see librarians as intermediaries involved in every step of providing users with information and, on the other side, those who advocate self-reliance of library users by teaching them how to find information by themselves.\textsuperscript{15} There may be correlations between the attitude that encourages users to depend on the librarian for their information needs and the attitude of the physician who controls the dissemination of information.

Two other points made with relation to medicine may have relevance to the library. First, the concern expressed about relegating the demanding patient to the role of “problem patient” and limiting communication certainly has its correlation. At a busy reference desk, a reference librarian might have a similar negative reaction to a verbose, more demanding user. The second important point is the emphasis of referent power over expert power. Users might be more receptive to the likeable, accepting communication style that typifies referent power.

**Outcome of Communication Failure**

When the patient or library user cannot comprehend the information that has been given to him or her, or cannot recall or use it, or is so dissatisfied with the interaction that he or she does not return, then harm has been done. Medical articles have investigated the negative outcomes of communication failure. Articles studying the independent variable of communication focus on its effect on four dependent variables: recall of information, compliance with instructions, medical outcome or success, and satisfaction.

**Recall**

Recall is very important in medicine because, unlike most library situations, individuals acquire information and then leave with the expectation that they will recall what they have learned and follow the instructions at home. Thus, recall is linked to what physicians call “compliance.”

In a study of medical terminology, Lyle Saunders and Richard Larson found that patients were unable to recall medical terms that they did not understand. They concluded:

Health practitioners who have facility with medical terms can think faster about medical topics than the patients with whom they are talking. In a discussion the practitioner may have gone on to a new topic while the patient is still trying to remember precisely what “abdomen”
means. Second, practitioners may be better able to remember past discus­sions and problems than patients because of their greater knowledge of medical language. The patient may have forgotten the explanation received at the last visit because all the terms were new to the patient. 

In other words, the fact that patient and physician do not share the same schemas impedes the patient's recall of instructions. Ley's study of patient recall found that patients fail to recall many of the instructions and information they receive. In fact, he found that the number of statements that patients forget increases with the number of statements presented. Neither age nor intelligence is consistently related to recall, but existing medical knowledge (schemas) do increase recall. Ley discovered that order is related to recall, with the last items presented being the ones best recalled. He also concluded that the amount people recall can be influenced by shorter words and sentences, recall could be enhanced if the librarian uses shorter words and sentences, explicitly categorizes types of information presented, repeats information, and is specific and concrete.

Other researchers have studied recall problems in terms of the communication process. One study found that half the instructional statements patients received and two-thirds of the statements dealing with diagnosis or treatment were forgotten and that, in general, there was no connection between the loss of information and the passage of time. 

How do these findings pertain to librarianship? Recall has not been heavily researched in the library field, as represented by the Library Literature and ERIC (education) bibliographic indexes. The findings described above could be instructive to reference staff, who would like library users to recall the information they give them. For instance, recall could be enhanced if the librarian uses shorter words and sentences, explicitly categorizes types of information presented, repeats information, and is specific and concrete.

Compliance
The second variable affected by communication problems is compliance. Compliance has been a major source of concern in the medical world for many years. One physician suggests that the word itself denotes "orders" followed by "good" patients. He argues that physicians should not use communication to persuade but, rather, to outline possible plans of action so that self-reliant patients can make their own informed choices, for which they will be responsible for the consequences.

Several possible reasons exist for patient noncompliance. As mentioned earlier, the patient's inability to recall the information is one reason. The patient might also be so dissatisfied with the interview, the doctor, or the suggested treatment that he or she ignores the instructions. Another reason might be a lack of understanding. The doctor may not have conveyed the instructions clearly, or the patient's schemas of experience vary too much with the message. Health care treatments are often complex, and concepts and terms are often new to patients, who may, instead, call upon their own existing schemas with regard to illness. Comprehension problems may result from the patients' inability to comply with the physician's suggestions.

Noncompliance may be unintentional or intentional. Analee Beisecker, in an article entitled "Patient Power in Doctor-Pa-
tient Communication,” suggests that patients may modify the prescribed treatment as a way to assert their independence and power. She states, “It should be noted, however, that in some cases, the modified treatment regimens are preferable to those prescribed by physicians, because patients are in tune with their own bodies and can perhaps determine a more appropriate dosage of medication than a physician applying standard protocols.”

Kathryn Rost and other researchers examined the exchange of information in relation to patient compliance. The study reviewed the intake interviews of forty-five patients. When they compared physicians’ discourse styles with compliance, they concluded that “exchange that allows the emergence during the examination of both the physician’s and patient’s perspective co-occurs with (if not influences) a patient’s decision to follow through with recommendations made during the visit.”

The authors also suggest that if patients provide information that doctors request and volunteer additional information, the partnership will be more likely to arrive at a definition of the problem that both partners share. Teaching physicians to invite patient input may enhance outcomes, according to the study.

Library literature has not addressed this problem of noncompliance. Librarians advise and instruct users, and because they are often physically nearby as users carry out their tasks, there is a sense that users are following through on their directions. Unlike physicians, librarians benefit from this proximity, as they are more readily available for additional clarification and any follow-up questions or concerns. Nevertheless, it would be interesting to observe how library users actually implement, or ignore, librarians’ suggestions. Given these medical findings on recall, the librarian concerned with users following through on instructions should think of the interview as an exchange, with both partners working to define and solve a shared problem.

**Ultimate Outcome or Success**

The effect of communication on the ultimate outcome of the medical or library intervention is of obvious interest to practitioners. Researchers found some connection between patient-physician communication and compliance, and medicine assumes a strong connection between a patient’s compliance with a medical regimen and symptom relief. A number of researchers have noted improvement in patients (e.g., quicker recovery time, symptom relief) stemming from improved compliance resulting from better communication between physician and patient. Based on these articles, increased physician responsiveness and the encouragement of patient involvement brought about improved communication.

One study on outcome, written by Sheldon Greenfield, found significant improvements in patients’ physical functioning after they received training in communication techniques designed to increase their involvement in their own care. The study consisted of an experimental group and a control group of patients with ulcers. Researchers taught patients in the experimental group to read their own medical records and coached the patients to ask questions and negotiate decisions. After the training, patients were more assertive and more involved with the physician during the medical interview. Eight weeks later, patients in the experimental group expressed more satisfaction with their care than the control group, preferred a more active role in decision making, and reported fewer physical limitations.

Beisecker also observed changes in patients who were encouraged by researchers to take a more active role in the medical interview. The patients she observed expressed opinions, asked questions, had a better understanding of their treatment, and appeared better able to
follow the treatment, leading to better medical outcomes. 24

In library literature, studies of ultimate outcome focus primarily on reference librarians' success in answering questions accurately. Accuracy measures consistently have found problems in terms of librarians providing library users with correct information. A number of research studies using unobtrusive testing indicate that librarians provide the correct answer only about 55 percent of the time. 25

Observers in the Durrance study were far more forgiving when library staff members had weak interviewing skills or gave inaccurate answers than if the staff member made them feel uncomfortable, showed no interest, or appeared to be judgmental about the question.

Undoubtedly, these studies alarmed many librarians. Improving reference accuracy is an aim that concerns reference librarians and administrators. Some libraries have been successful in their conscious efforts to raise staff accuracy rates. For example, Ralph Gers and Lillie Seward studied Maryland public libraries and focused on the variable of feedback. According to the study, librarians who did not solicit feedback from library users supplied correct answers 52 percent of the time. Librarians who asked for feedback, asking users whether their questions had been answered, were able to provide better assistance, resulting in a 76 percent accuracy rate. 26

Answer inaccuracy is only part of the problem, however. Physicians can disseminate accurate information and, for various reasons, the patient still may not have a successful outcome. Poor communication techniques may lead to accurate information not getting through to the hearer. Conversely, good communication techniques can actually result in a satisfied hearer even if the content of the information is not very accurate.

One author, Joan Durrance, raised the question, "Does the 55 percent rule tell the whole story?" Durrance reported on a study in which observers rated 266 librarians in terms of their reference interview skills. Results consistently showed that subjects who gave high scores to the librarians on the interpersonal variables of comfort, friendliness, and interest were almost certain to return to the same library staff member. Those who gave a high ranking to librarians on the skill variables of determining need and interviewing ability would also return.

Durrance noted that in terms of skill, the study did bear out what other studies have concluded—that librarians frequently have poor interviewing skills. Observers in the study determined that only 27 percent of the librarians found out what the questioner needed. Other variables, such as a display of interest, were perceived to rank high in importance. Observers in the Durrance study were far more forgiving when library staff members had weak interviewing skills or gave inaccurate answers than if the staff member made them feel uncomfortable, showed no interest, or appeared to be judgmental about the question. This study concluded that accuracy is an important, but not the only, crucial key to the success of the reference interview. 27

Recently, some libraries began using alternative, more qualitative surveys to evaluate reference service effectively. These methods foster librarian behaviors in a multidimensional way. They measure effectiveness not only in terms of accuracy, but in terms of factors such as availability, question interpretation, and communication. These evaluation instruments are discussed in specific terms that can be adapted by other libraries. 28

Satisfaction
The final section of this discussion of outcome is devoted to satisfaction, which is
really another measure of ultimate outcome or success. In 1968, a team of physicians researched doctor-patient interaction and patient satisfaction with a survey of 800 parents of children in a hospital pediatrics unit. Researchers asked subjects to evaluate the medical interview with their children’s physician and to rate their satisfaction level with the physician.

Seventy-six percent of the parents were highly or moderately satisfied. Those who made favorable note of the physician’s communication skills (making statements such as “He listened to me,” “He explained so well”) were dramatically more satisfied than those who disparaged their pediatrician’s communication skills. Several unexpected findings emerged. For instance, although parents went in to the interview with specific main worries, only 24 percent of these worries were verbalized to the doctor. Thus, even if they never raised what most concerned them, they were still generally satisfied. The authors raise an interesting point when they say that the measure of patient satisfaction may be suspect “because quacks, faith healers, and so forth are notorious for producing high satisfaction in their clientele, even though the service that is offered is of low quality or dishonest at times.”

Other researchers found that the amount of informativeness and the display of feelings such as empathy were highly correlated with satisfaction. It is important to note, as several studies did, that patients vary in their preferences for a physician’s behavior. Some prefer more directive approaches than others and prefer acquiring information without necessarily accepting responsibility for decision making.

In the library world, some measures of library user satisfaction are part of major evaluation studies. Some authors have questioned the weight ascribed to satisfaction measures. This is because, as was found in one of the medical studies, an individual often expresses satisfaction even if he or she walks away with what might be considered inadequate information. In fact, despite reports of a 55 percent accuracy rate, many user surveys indicate a satisfaction rating for reference service that surpasses 90 percent.

A person’s satisfaction level with library staff service can be attributed to attention, a friendly attitude, and a few citations. Thus, satisfaction levels are important because a satisfied user will be more likely to want to return to a given library and librarian. But satisfaction is not enough if the results of research are wanting. If the user leaves the library with inaccurate or insufficient information, it matters little that the person feels satisfied.

Several researchers studied satisfaction in conjunction with user success. Charles Bunge and Marjorie Murfin surveyed both users and librarians at fifteen libraries. In the area of satisfaction, they found that the one factor that led to users becoming more dissatisfied was the degree of busyness of the librarian, leading to brief, one-source transactions. Bunge and Murfin also found what they considered to be a greater sensitivity to user feelings among successful librarians. In the successful libraries (highest in user success and satisfaction), the librarians were more aware of communication difficulties, reporting difficulties on the same questions where the users reported difficulties.

In summation, medical and library studies have found that good communication skills and sensitivity to communication problems have an effect on patient/user satisfaction. Measuring satisfaction and improving it via improving communication skills would likely benefit any institution, in terms of increasing user return rates and overall positive attitudes.

A Model for Outcome
The author devotes a good deal of this paper to outcome in the medical and li-
library settings. Outcome is affected by communication in various ways. Figure 2 summarizes the interactions between the various factors.

The comprehension of the hearer (the patient or the library user) is affected by variables such as the amount of information presented, the hearer's anxiety level, the speaker's use of jargon, and the speaker's techniques, such as use of repetition and categorization of ideas into units that are easier to assimilate. Comprehension affects recall, which affects compliance or the following of instructions.

Recall alone is not always enough to ensure compliance. Other variables that may have an effect on recall are the hearer's agreement with the diagnosis or suggestion, and the speaker's communication style. One type of style that seems to promote compliance is a sharing style, where both parties exchange information. Style also affects satisfaction.

Compliance with a good suggestion usually results in success. Compliance can also lead to a sense of satisfaction. Likewise, satisfaction with an interaction can lead to compliance with instructions. Success certainly leads to satisfaction, and satisfaction can be considered an outcome.

All of this interplay of factors is surrounded by the effects of both parties' existing schemas. In addition, interaction may be affected by the environment, which might consist of waiting library users, the number of staff members, the reference collection, rules and procedures, the ringing of telephones, and so forth.

Enhancing Communication: Techniques and Training

This paper describes some of the outcomes that medical researchers identified as being associated with communication problems. A number of suggestions are offered for avoiding such problems at the reference desk, thereby improving library users' recall of instructions, ability to comply with suggestions, ultimate outcome or success, and satisfaction.

In terms of specific interview techniques and training, medical articles offer few details. However, they do offer a body of literature demonstrating in study after study that medical students trained
in interviewing skills conduct more successful medical interviews than students without training. Students with training not only elicit a greater amount of relevant information from patients, but also are better able to communicate empathy and to detect and respond to patients' verbal and nonverbal cues—skills that remain over time.

Several types of teaching seem conducive to the learning of effective interview techniques. In one detailed article on teaching these skills, B.J. Evans and others outline an eleven-hour, eight-session course in medical history-taking. The course heavily emphasizes the use of active learning formats such as discussions, role-plays, and videotaping with real and simulated patients.

Although librarians can learn from these controlled studies, they can probably learn more about techniques and, to a lesser extent, training from their own literature than from medical literature. For example, two far-ranging and practical books on reference interview techniques are Elaine Jennerich's The Reference Interview as a Creative Art and Catherine Ross's and Patricia Dewdney's Communicating Professionally: A How-to-Do-It Manual for Library Applications. These books lay out the foundations for better communication techniques, giving examples that are relevant to the reference encounter. A number of detailed articles have been written on specific techniques described in the Jennerich and Ross-Dewdney books, such as active listening and the effective opening and closing of the reference interview. Given that such methods recognized in librarianship are effective interview techniques, how do librarians best learn them? A lengthy discussion of teaching methods cannot be given here, but a few suggestions should be made.

The medical articles cited at the beginning of this section suggested that the poor interviewing techniques of medical students negatively affected patients' outcomes. Through training, often involving active learning such as role-playing, videotaping, and the practicum or internship, their techniques improved and continue to improve.

Library courses that employed the same methods, particularly the use of more than one class session to address communication issues, seem to have similar positive effects on students' interviewing skills. In general, however, the communication barriers and techniques are only briefly touched upon in library schools. In a recent request via the Internet listserv LIBREF-L for information on the teaching of the reference interview in library schools, the author received a dozen or so lukewarm responses about such lectures. The most enthusiastic librarian comments about classes that prepared them for the real-life reference interview were multisession communication courses such as those offered at the University of Pittsburgh and the University of Michigan.

Interview skills can be taught in the workplace. Libraries employed many varieties of continuing education. Several sites have implemented peer coaching. A reference coordinator or department head might help alert colleagues to communication techniques. Articles such as those cited in this article could be routed and discussed at meetings. Good videotapes on reference skills could be acquired and shown. The best method is probably a combination of approaches, offered on a fairly regular basis.
Medicine borrows from other disciplines when designing communication components for courses, according to some sources. Librarians, too, can learn from other professions. Counseling or even medical curricula can be modified for library schools or continuing education sessions. Some library authors write about such applications.39

Conclusions
This paper began with a look at some of the communication problems that physicians themselves have identified in the patient-physician relationship. Others, too, such as advocates of the Plain English movement, have called upon physicians to simplify explanations, avoid undefined jargon, and avoid using language that creates a distance between patient and physician. The physician’s language has also been tied to issues of power and control. The negative outcomes of physicians’ communication problems are varied and extensive.

These problems and their outcomes are relevant to librarianship, which also features jargon and an environment that seems to lend itself to complex explanations. Like physicians, librarians must choose whether to view the nature of the interview as an opportunity to control information or as an opportunity to exchange information with the library user. I agree with those who urge experts in the medical and library worlds to rethink their relationships to nonexperts, and to work toward the sharing of knowledge using referent power rather than the monopolization of knowledge, which is often typical of expert power.

Some physicians are learning to cultivate skills “that respect patients’ intelligence, acknowledge their needs, accept their feelings, value their opinions, and promote collaboration in decision making.”40 The library world also must heighten its awareness of the issues presented here, through library schools placing greater emphasis on interpersonal communication, through on-the-job training, through quality-based evaluation, and, most important, through a commitment to lower the communication barriers between librarians and library users.

Notes


26. Gers and Seward, "Improving Reference Performance."


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The Changing Nature of Jobs: A Paraprofessional Time Series

Carol P. Johnson

This study attempts to determine if paraprofessional jobs have changed significantly as a result of automation during the period between 1975 and 1990. Three raters reviewed job descriptions dated 1975, 1981, and 1990 from the technical services department of a small academic library using the Position Analysis Questionnaire, a widely used structured job analysis tool. Analysis of the resulting data—standard z scores on thirteen overall job dimensions using ANOVA and omega-squared estimates—indicates no statistically significant differences among the jobs. Although these results show that the change in jobs over time is more idiosyncratic than expected, they may also illustrate the de-skilling effect of computers on library functions.

In 1984, Alan Veaner noted that "once a technology is applied to carry out very complex, routine mental work, that work is driven downward in the work hierarchy. . . . The change has provided magnificent professional enrichment opportunities for librarians and has similarly enriched the jobs of support staff." This insight raises an interesting question. With the downward shift in tasks from librarians to paraprofessionals, is there evidence of a corresponding upgrade in the paraprofessional's responsibilities? Have paraprofessional jobs changed significantly as a result of automation?

Much has been written in recent years about the working conditions and responsibilities of paraprofessionals by authors such as Charlotte Mugnier, Larry R. Oberg, and Cathleen C. Palmini. Other researchers, among them Darla Rushing and Ann Prentice, concentrated on the impact of automation on the library organization and specific departments. Scholars such as Harry Braverman and Shoshana Zuboff have written about the complicated effects of automation on the workplace from deskilling to the difficulties of managing computer-mediated work. Specific research by Suzanne Iacono and Rob Kling indicates that technology neither automatically degrades nor improves a job. The differences are because of the ways in which work is organized rather than because of the technology. A search of library literature does not indicate any studies examining library paraprofessional jobs over time to determine what changes, if any, have taken place as a result of technology.

This study uses the Position Analysis Questionnaire (PAQ), a widely used structured job analysis tool, to examine,

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on a micro level, the job descriptions of three paraprofessional jobs in an academic library technical services department at a small, private liberal arts college. Dated 1975, 1981, and 1990, the job descriptions are examined to determine what, if any, changes occurred as a result of automation and to see if there are statistically significant differences among the jobs over time. To some extent, these three jobs do reflect both a job progression over time and changing responsibilities because of automation.

Structured job analysis tools differ from the job evaluation systems used to determine organizational compensation.

Research into statistical methods to analyze job data for the purposes of determining job similarities and differences began in the late 1970s and 1980s for Equal Employment Opportunity Commission purposes.

According to Roberts' Dictionary of Industrial Relations, "job analysis is the systematic investigation or study of a job or position to determine the responsibilities, duties and qualifications required to perform the job." Job evaluation is the "process of determining the classification, rating or value of an individual job in relation to the other jobs in an organization." Job analysis, often an informal process, provides the data for job evaluation, and typically, job evaluation systems reflect the values and politics of the local organization. This study attempts to study the jobs in question using a methodology that is not affected by local values and politics.

There are a number of more formal job analysis methods available for organizations to use. Among these are Functional Job Analysis, the Job-Element approach, the PAQ, Critical Incidents Methodology, and Task Inventories. However, this study required a job analysis tool that produces quantitative data for comparison and limits its potential rater bias. The tool chosen was the PAQ, which rates jobs quantitatively on 187 elements of work activity and the work environment. The instrument is based on the concept that human work can be analyzed "in terms of meaningful 'units' or job elements of a worker-oriented nature." The designers assumed that there was a commonality across jobs resulting from the workers doing similar things and not as a result of the technology used or the product produced.

The PAQ's present form evolved over several decades from its earliest form, The Checklist of Work Activities, developed in 1958 by Ernest J. McCormick and G. J. Palmer. In its present form, job raters respond to each of the 187 questions using Likert-format scales. These questions are organized into six divisions: (1) information input; (2) mental processes; (3) work output; (4) relationships with other persons; (5) job context; and (6) other job characteristics. Results are provided for each of these categories, plus thirteen overall dimensions. Overall dimensions include: (1) decision, communication, and general responsibilities; (2) machine/equipment operation; (3) clerical activities; (4) technical activities; (5) service activities; (6) work schedule; (7) routine or repetitive activities; (8) work environment; (9) physical activities; (10) supervision; (11) public contacts; (12) hazardous environment; and (13) flexible schedule/optional apparel. Each division includes elements that tend to occur in combination on the job. The rater-scored sheets are analyzed by computer, and standard z scores are provided for each job/rater for each of the six divisions plus the overall dimensions.

Research into statistical methods to analyze job data for the purposes of determining job similarities and differences began in the late 1970s and 1980s for Equal Employment Opportunity Commission purposes. These articles focused on the type of job analysis tool used to
describe the job (task oriented, worker oriented, or abilities oriented) and the statistical techniques employed to analyze the data.\textsuperscript{14}

In a 1977 article, Richard D. Arvey and Kevin M. Mossholder proposed the use of analysis of variance (ANOVA) combined with the omega-squared estimate to compare jobs and determine similarities for validity generalization purposes.\textsuperscript{15} In a later study, Arvey and fellow researchers found that given a reasonable sample size, the ANOVA model was an effective design in detecting true differences among jobs, but the omega-squared estimates were more useful in determining job differences even across small sample sizes. They determined that a reasonable rule of thumb would be that "values near .30 indicate major job differences among jobs and values less than .15 indicate considerable job similarities."\textsuperscript{16}

In an unpublished 1984 study, Arvey and fellow researchers hypothesized that one way to measure changes in jobs over time was to measure job description information over time using the thirteen overall dimension z scores generated by the PAQ.\textsuperscript{17} This article reports the findings of a statistical analysis of the PAQ results from these three positions using the ANOVA and omega-squared estimates.

**Methodology**

The authors derived the information for the analysis from job descriptions dated 1975, 1981, and 1990. The three jobs reflect three paraprofessional library jobs in the cataloging department of a small, academic library.

**Job 1**

In 1975, one position that could be described as paraprofessional existed in the cataloging department of the library. Master's-level librarians and clerks filled other positions. The position assisted the cataloging librarian in maintaining the public catalog and technical services-specific files, supervising and training student employees in filing cards in the main catalog, and searching for available copy cataloging using print tools. A high school education was required, and supervisory and typing skills were useful. The training curve was estimated at six months.

**Job 2**

By 1981, the number of paraprofessional positions increased and two levels existed. Computerized cataloging via OCLC began in 1976. The paraprofessional in this job (level 2) located, reviewed, and modified cataloging copy in the OCLC database using the computer terminal. A second responsibility involved maintenance of the shelf list. Two years of college-level study, one year of experience as a library technician, computer training, and typing skills were necessary.

**Job 3**

By 1990, computers had replaced catalog cards, and database record maintenance and editing had replaced card filing. The main responsibility of the position involved database coordination, supervision of catalog entries, and media cataloging. The job now required two years of experience as a library technical assistant, level 1.

Based on the changes in selection requirements and the tasks performed, the author expected that the ANOVA model would find significant statistical differences among the jobs and reasonable omega-squared values for the job x dimension effects. Three raters reviewed each job description (nine in all) to prevent biased results. They used the *Job Analysis Manual for the Position Analysis Questionnaire*. The raters, who were not experienced job analysts, consisted of one degreed librarian familiar with the job at the time in question; one degreed librarian who occupied a similar position in another library of the same size; and a third
library staff person familiar with the job (librarian or incumbent). The results were submitted to PAQ Services, Inc., in Utah for analysis.

The PAQ results were then run on SPSS using the ANOVA model. The ANOVA model is used to detect significant differences among jobs. For the ANOVA model, the dimension scores are considered a within-job factor, the jobs, and a between-job factor with raters nested between jobs. A significant F-value for the between-job factor indicates that there are statistical differences between the jobs.

A significant F-value for the job x dimension interaction would indicate that the profiles of the jobs are significantly different; that is, the job dimensions differ across the jobs. The omega-squared estimate is calculated when the F-values indicate significant differences among jobs to determine the proportion of variance of the job dimensions (job similarities) and the proportion of variance because of job x dimension (job differences).

Results
PAQ-derived job evaluation points (mean) (see table 1) for the three jobs were: job 1 (1975), 621; job 2 (1981), 645; and job 3 (1990), 698 (see the time series chart in figure 1 and table 2 for the job profiles and z scores on the thirteen overall dimensions). For each job and rater, the PAQ provided z scores for the six divisions—information output, mental processes, work output, relationships with other persons, job context, and other job

<table>
<thead>
<tr>
<th>Rater 1</th>
<th>Rater 2</th>
<th>Rater 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job 1 (1975)</td>
<td>503</td>
<td>688</td>
</tr>
<tr>
<td>Job 2 (1981)</td>
<td>667</td>
<td>657</td>
</tr>
<tr>
<td>Job 3 (1990)</td>
<td>771</td>
<td>640</td>
</tr>
</tbody>
</table>

FIGURE 1
Time Series Job Comparison on PAQ Library Technician Series
The ANOVA on the thirteen overall dimension z scores (table 4) indicated no significant statistical differences among jobs, nor a significant job x dimension interaction. The job x dimension accounted for .008 percent of the variance; the source of variance as a result of jobs accounted for .004 percent. The value resulting from the ratio of variance indicates there is almost eighteen times the variance because of job similarities than job differences. Extremely low omega-squared scores (<.15) indicated very strong job similarities, not differences.

TABLE 2
Z Scores on Overall Dimensions for Jobs 1–3, Mean Scores

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Dim1</th>
<th>Dim2</th>
<th>Dim3</th>
<th>Dim4</th>
<th>Dim5</th>
<th>Dim6</th>
<th>Dim7</th>
<th>Dim8</th>
<th>Dim9</th>
<th>Dim10</th>
<th>Dim11</th>
<th>Dim12</th>
<th>Dim13</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Having decision, communication, and general responsibilities</td>
<td>-.35</td>
<td>-.77</td>
<td>-.03</td>
<td>-.14</td>
<td>.16</td>
<td>.22</td>
<td>.48</td>
<td>-.81</td>
<td>.66</td>
<td>.93</td>
<td>-.78</td>
<td>-.79</td>
<td>.32</td>
</tr>
<tr>
<td>2. Operating machines and/or equipment</td>
<td>-.08</td>
<td>-.30</td>
<td>.50</td>
<td>-.47</td>
<td>-.29</td>
<td>.29</td>
<td>.18</td>
<td>-.90</td>
<td>.10</td>
<td>.92</td>
<td>-.45</td>
<td>-.49</td>
<td>.60</td>
</tr>
<tr>
<td>3. Performing clerical and/or related activities</td>
<td>.07</td>
<td>-.34</td>
<td>.13</td>
<td>-.17</td>
<td>-.40</td>
<td>.39</td>
<td>.16</td>
<td>-1.01</td>
<td>-.02</td>
<td>.65</td>
<td>-.70</td>
<td>-.47</td>
<td>.15</td>
</tr>
<tr>
<td>4. Performing technical and/or related activities</td>
<td>.07</td>
<td>-.34</td>
<td>.13</td>
<td>-.17</td>
<td>-.40</td>
<td>.39</td>
<td>.16</td>
<td>-1.01</td>
<td>-.02</td>
<td>.65</td>
<td>-.70</td>
<td>-.47</td>
<td>.15</td>
</tr>
<tr>
<td>5. Performing service and/or related activities</td>
<td>.07</td>
<td>-.34</td>
<td>.13</td>
<td>-.17</td>
<td>-.40</td>
<td>.39</td>
<td>.16</td>
<td>-1.01</td>
<td>-.02</td>
<td>.65</td>
<td>-.70</td>
<td>-.47</td>
<td>.15</td>
</tr>
<tr>
<td>6. Other work schedules vs. working regular day schedules</td>
<td>.07</td>
<td>-.34</td>
<td>.13</td>
<td>-.17</td>
<td>-.40</td>
<td>.39</td>
<td>.16</td>
<td>-1.01</td>
<td>-.02</td>
<td>.65</td>
<td>-.70</td>
<td>-.47</td>
<td>.15</td>
</tr>
<tr>
<td>7. Performing routing and/or repetitive activities</td>
<td>.07</td>
<td>-.34</td>
<td>.13</td>
<td>-.17</td>
<td>-.40</td>
<td>.39</td>
<td>.16</td>
<td>-1.01</td>
<td>-.02</td>
<td>.65</td>
<td>-.70</td>
<td>-.47</td>
<td>.15</td>
</tr>
<tr>
<td>8. Being aware of work environment</td>
<td>.07</td>
<td>-.34</td>
<td>.13</td>
<td>-.17</td>
<td>-.40</td>
<td>.39</td>
<td>.16</td>
<td>-1.01</td>
<td>-.02</td>
<td>.65</td>
<td>-.70</td>
<td>-.47</td>
<td>.15</td>
</tr>
<tr>
<td>9. Engaging in physical activities</td>
<td>.07</td>
<td>-.34</td>
<td>.13</td>
<td>-.17</td>
<td>-.40</td>
<td>.39</td>
<td>.16</td>
<td>-1.01</td>
<td>-.02</td>
<td>.65</td>
<td>-.70</td>
<td>-.47</td>
<td>.15</td>
</tr>
<tr>
<td>10. Supervising/directing/estimating</td>
<td>.07</td>
<td>-.34</td>
<td>.13</td>
<td>-.17</td>
<td>-.40</td>
<td>.39</td>
<td>.16</td>
<td>-1.01</td>
<td>-.02</td>
<td>.65</td>
<td>-.70</td>
<td>-.47</td>
<td>.15</td>
</tr>
<tr>
<td>11. Public and/or customer and/or related contacts</td>
<td>.07</td>
<td>-.34</td>
<td>.13</td>
<td>-.17</td>
<td>-.40</td>
<td>.39</td>
<td>.16</td>
<td>-1.01</td>
<td>-.02</td>
<td>.65</td>
<td>-.70</td>
<td>-.47</td>
<td>.15</td>
</tr>
<tr>
<td>12. Working in an unpleasant/hazardous/demanding environment</td>
<td>.07</td>
<td>-.34</td>
<td>.13</td>
<td>-.17</td>
<td>-.40</td>
<td>.39</td>
<td>.16</td>
<td>-1.01</td>
<td>-.02</td>
<td>.65</td>
<td>-.70</td>
<td>-.47</td>
<td>.15</td>
</tr>
<tr>
<td>13. Having a nontypical schedule/optional apparel style</td>
<td>.07</td>
<td>-.34</td>
<td>.13</td>
<td>-.17</td>
<td>-.40</td>
<td>.39</td>
<td>.16</td>
<td>-1.01</td>
<td>-.02</td>
<td>.65</td>
<td>-.70</td>
<td>-.47</td>
<td>.15</td>
</tr>
</tbody>
</table>

 characteristics—as well as the thirteen overall dimensions. Researchers tested the z scores for the thirteen overall dimensions (see table 3) to determine job differences. Computed interclass correlation coefficients for each job ranged from .69 to .84, sufficient for preceding with the ANOVA. These coefficients were minimally above the average reliability coefficient (.68) reported for a sample of over 1,000 jobs involving over 3,000 pairs of analysts in a study of the PAQ interanalyst reliability.18

TABLE 3
Z Scores on Overall Dimensions for Jobs 1–3, Raters 1–9

<table>
<thead>
<tr>
<th>Job</th>
<th>Rater</th>
<th>Dim1</th>
<th>Dim2</th>
<th>Dim3</th>
<th>Dim4</th>
<th>Dim5</th>
<th>Dim6</th>
<th>Dim7</th>
<th>Dim8</th>
<th>Dim9</th>
<th>Dim10</th>
<th>Dim11</th>
<th>Dim12</th>
<th>Dim13</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>-.83</td>
<td>-.84</td>
<td>-.56</td>
<td>.04</td>
<td>.38</td>
<td>.21</td>
<td>.65</td>
<td>-.60</td>
<td>-.16</td>
<td>1.09</td>
<td>-.58</td>
<td>-.55</td>
<td>.22</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>-.08</td>
<td>-.51</td>
<td>.33</td>
<td>.12</td>
<td>-.03</td>
<td>.21</td>
<td>.50</td>
<td>-.65</td>
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<td>.94</td>
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<td>.13</td>
<td>1.21</td>
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<td>-.45</td>
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<td>-.12</td>
<td>.25</td>
<td>-.02</td>
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<td>.25</td>
<td>.65</td>
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<td>-.28</td>
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<td>.02</td>
<td>-.08</td>
<td>-.31</td>
<td>.40</td>
<td>.37</td>
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<td>-.42</td>
<td>-.21</td>
<td>-.18</td>
<td>-.67</td>
<td>.26</td>
<td>-.12</td>
<td>-.89</td>
<td>-.17</td>
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<td>-.03</td>
<td>.08</td>
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<td>.20</td>
<td>-.29</td>
<td>.31</td>
<td>-.31</td>
<td>-.61</td>
<td>.30</td>
<td>.06</td>
<td>-1.12</td>
<td>.57</td>
<td>.67</td>
<td>-1.02</td>
<td>-.69</td>
<td>.50</td>
</tr>
</tbody>
</table>
Hypothesizing that the thirteen overall dimension scores were too abstract or general, the author ran ANOVAS on the subscores of four selected divisional sets of z scores:

**Division 1**
- Information input
- Interpreting what is sensed
- Using sources of information
- Watching devices and/or materials for information
- Being aware of environmental conditions
- Using various devices

**Division 2**
- Mental processes
- Making decisions
- Processing information

**Division 3**
- Work output
- Using machines and/or tools and/or equipment
- Performing activities requiring general body movements
- Controlling machines or processes
- Performing skilled and/or technical activities
- Performing controlled manual and/or related activities
- Using miscellaneous equipment and/or devices
- Performing handling and/or related activities
- General physical coordination

**Division 4**
- Relationships with other persons
- Communicating judgments and/or related information
- Engaging in general personal contact
- Performing supervisory and/or coordinating and/or related activities
- Exchanging job-related information
- Public and/or related personal contacts

The ANOVA results show no significant differences for any of the four divisions.

**Discussion**
Test results indicate that there are no significant statistical differences among the 1975, 1981, and 1990 jobs using the ANOVA model to analyze the PAQ's thirteen overall dimensions. These results do not support a conclusion that technology has significantly upgraded the paraprofessional positions under review. Indeed, the results indicate change, but of an unexpected nature: job redesign to meet the needs of the time (old skills discarded, new ones learned), resulting in the replacement of some duties by others. Increased efficiency of work flow and operations, in this particular situation, resulted in a narrowing of functions, not an upgrading of responsibilities.

Although not statistically significant, the total mean job evaluation points have increased over time (from 621 to 698) as a result of the increased educational requirements. Mort McPhail of Jeanneret and Associates produced a list of twenty-six PAQ elements likely to be affected by automation. He noted that technology can increase or decrease the worth of the job. Increases "in such ratings as training and experience required may be offset by decreases in items dealing with decision making, combining and analyzing information, etc., and the jobs may have become simpler and less demanding to perform." 19

Also noticeable is a shift in responsibilities discernible by viewing the individual PAQ “Item With Highest Percentile Scores” sections of the PAQ reports (copies of these are available from...
Supervision, which had the highest percentile score in the 1975 job and is usually valued highly in job evaluation systems, declined. The highest percentile PAQ item for the 1990 job deals with machines and equipment, not people. The next highest is inspecting, as opposed to students/trainees for the 1975 job. The 1990 job is indeed different, reflecting an apparent rearrangement of work activities brought on by automation.

The history of library automation can explain much about the changes in these three jobs. Automation for the smaller library began with cataloging functions. In the late 1970s, the majority of libraries became members of cooperative national cataloging bibliographic utilities, such as OCLC. Shared online cataloging produced the catalog cards and machine-readable archival tapes, and changed the job structure in some cataloging departments.

The shift to online cataloging meant that more copy cataloging was done, particularly as the number of contributing libraries increased. Copy cataloging (editing a specific record to meet local library requirements) did not require the skills of a degreed librarian. Rather, it required an individual able to understand cataloging terminology, use computers, and learn the coding requirements of the bibliographic utility. Those libraries that chose to employ nondegreeed library staff to perform copy cataloging incorporated these requirements by increasing the educational and training requirements for the job. All other job requirements remained the same.

This is also reflected in the duties and responsibilities of the 1981 position. "Relations with Professional Personnel" was the highest-ranking PAQ item for this job. Paraprofessionals performed the same duties as some librarians: copy cataloging and supervision. Automation at this time contributed to the confusion of roles between professional and paraprofessional.

A review of division 4 (relationships with other persons) z scores supports the above contention that job responsibilities have changed. It is evident that the 1990 position requires more judgment communication, less general personal contact, less supervisory responsibility, and less public contact than the two previous jobs. The 1976 automation of cataloging functions increased the job level (1981) by including copy cataloging; but by 1990, a narrowing of job function had occurred as librarians learned to adapt office automation strategies of work flow and efficiency to cataloging functions. The 1990 job provides more responsibility for database management but decreased supervisory responsibility.

### Conclusion

This study began as an effort to understand the impact of computers on the paraprofessional jobs in the technical service department of one library, anticipating a statistically significant difference. The author believed that the addition of OCLC copy cataloging to the 1981 position, and definitely the addition of database record maintenance and media cataloging to the 1990 position, would make

---

**TABLE 4**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>$\omega^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between Jobs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jobs (A)</td>
<td>2</td>
<td>.08</td>
<td>-.004</td>
<td></td>
</tr>
<tr>
<td>Raters within jobs C(A)</td>
<td>6</td>
<td>.28</td>
<td>.28</td>
<td>.01</td>
</tr>
<tr>
<td><strong>Within Jobs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions (B)</td>
<td>12</td>
<td>2.21</td>
<td>20.78</td>
<td>.215</td>
</tr>
<tr>
<td>Job x dimensions</td>
<td>24</td>
<td>.15</td>
<td>1.42</td>
<td>.008</td>
</tr>
<tr>
<td>Dimension x raters within jobs (B x C(A))</td>
<td>72</td>
<td>.11</td>
<td>.11</td>
<td></td>
</tr>
</tbody>
</table>
a statistically significant difference. This did not occur. Perhaps this is the result of the unique job history or pattern for this particular library, or it may result from the PAQ's worker orientation (as opposed to task orientation), which may not discriminate sufficiently to measure the "real" job difference. Duplication of the study in other libraries should be undertaken to see if similar results are found.

In this particular case, technology, often viewed as a way to upgrade the status of library positions, does not seem to have raised the job level. One reviewer of this article noted that it seems "counter intuitive" that increasing levels of required education do not make a differ-

Technology, a better educated work force, fewer accredited library schools, and the continuing democratization of the information process will all continue to exacerbate the problem in the future.

ence. Although qualifications (KSAs) are used as data in the PAQ, in this case the unique blend of responsibilities in each job resulted in some dimensions, highly valued in job evaluation systems, decreasing. Others, also highly valued, stayed the same or increased. The combination of increases, balanced against decreases was not enough to produce a statistically significant difference.

All libraries attempt to recruit staff with high qualifications; however, this is a subjective judgment area. With the changing work environment, the question of what qualifications are necessary to perform the work at each level of the library organization is a legitimate subject for research. This study attempted to find a tool that would examine jobs over time with as little bias as possible, but further studies are needed to answer that question. The paraprofessional jobs under review have not been significantly upgraded because the responsibilities that upgrade positions and typically lead to better pay (typically, autonomy; authority, including supervisory responsibility; and decision-making) are not reflected in the jobs under review.

The national adoption of MARC as the preferred way for most libraries to catalog library materials has resulted in the standardization of cataloging rules and practices. MARC copy cataloging computerizes and standardizes the level of decision making. This permits non-MLS staff to take over the bulk of copy cataloging. As Shoshana Zuboff noted, "the purpose of the intelligent technology at the core of a computer system is to substitute algorithms or decision rules for individual judgments. This substitution makes it possible to formalize the skills and know-how intrinsic to a job and integrate them into a computer program." 20

This study indicates that automation has not upgraded technical services library paraprofessional positions as much as the author had thought. The functions remain the same, but the tools change (and the level of the person doing the work). However, this study did not investigate the intrinsic rewards that technology may add to jobs by including responsibilities that are more interesting and central to the operation of libraries. There are new jobs in libraries that did not exist prior to the introduction of computers; it would be interesting to identify these and compare them with the more traditional jobs of libraries. The future library will have both. Real improvement in the status of paraprofessionals is dependent upon the level of authority, autonomy, and skill assigned to the jobs they fill. This will not occur without further study of the necessary qualifications for all levels of library work and the appropriate ways to obtain those qualifications.

Technology is a means, not an end; and it is not the answer to the increasing uncertainty that besets the profession. The deskilling effects of computers certainly
complicate an already complex situation. Technology, a better educated work force, fewer accredited library schools, and the continuing democratization of the information process will all continue to exacerbate the problem in the future. Researchers need more data to clarify both paraprofessional and professional positions and their respective roles in libraries. Job analysis using tools such as the PAQ may provide useful data to aid in the discussion.

Notes

The Effect of CD-ROM Instruction on Search Operator Use

Trudi E. Jacobson and Janice G. Newkirk

This study reports the results of a survey of 675 CD-ROM users, obtaining data from both questionnaires and actual search strategies. One of the authors' primary concerns involved investigating the effect of prior instruction or assistance on search strategy. The authors found a statistically significant but weak relationship between prior instruction and level of search skill. Other measures such as user status, department affiliation/major, age, sex, and number of previous CD-ROM uses were compared to search skill. Only user status and department affiliation/major were significantly correlated to search skill. Additional research is needed on the effectiveness of various types of CD-ROM instruction.

CD-ROM searching has substantially increased the service demands in libraries since its advent almost a decade ago. Public service academic librarians spend a considerable amount of time assisting and instructing patrons in the use of these end-user databases. Yet, for all the time and money devoted to these activities, little research has been done on their effectiveness. The authors based their instruction and assistance approaches on what they discovered helping people with paper resources, adding, of course, information about the technology.

Research indicates that many library patrons do not search very well. Conversely, research shows that patrons enjoy using CD-ROM indexes, whether they use them successfully or not. Research also indicates that librarians are assisting and instructing patrons in increasing numbers. (At the University at Albany, State University of New York, CD-ROM questions as a percentage of total reference questions have steadily increased at a rate of two percent per year since 1992.) But does such assistance and instruction affect patrons' search skills? Does the immense investment in patron assistance with CD-ROMs matter?

These may be two of the most important questions in academic library public services today, yet remarkably little re-
search has directly addressed them. At the University at Albany, the authors thought it was time to examine these issues. With a grant from the Spencer Foundation, the authors set out to study what impact librarian instruction and assistance were having on CD-ROM searching. We hoped to find out whether classes and one-on-one assistance from librarians had a considerable impact on end-user search proficiency. We hypothesized that patrons who had attended searching classes or who had been directly assisted by librarians (or trained library assistants) would be far more sophisticated searchers. Specifically, we wanted to test whether end-users having training or assistance would use more Boolean operators, field searches, and referrals to previous search terms than end-users who had no assistance or instruction.

Literature Review
Although the CD-ROM and end-user literature includes evaluations of end-user searching . . . there are few studies that assess the impact of instruction on end-user searching.

Methodology
Project Design
The current project involved a two-part collection of data. One part involved administering a survey to all library patrons using SilverPlatter CD-ROMs during selected periods. This survey included a questionnaire (available from the authors) to collect basic demographic data, information on the respondents' experience with computers, and information on what type of prior instruction and/or assistance respondents had in CD-ROM searching. The second part of the data collection involved saving each respondent's search strategy and attaching it to the questionnaire. We employed three students to administer the survey during morning, afternoon, and evening hours, weekends as well as weekdays, from February through May of 1994. These students were available to answer questions that arose as respondents filled out the questionnaire. In all, the students approached more than a thousand patrons for the survey. We discarded several hundred surveys because the patrons indicated that they had received the immediate and direct assistance of a librarian with the search in question. We concluded that these search strategies would represent the librarians' rather than the patrons' efforts. We collected a total of 675 usable surveys.

Survey Instrument
The questionnaire was divided into four sections: section 1 gathered basic demographic data, and section 2 evaluated the respondents' computer experience. We
hypothesized that CD-ROM searchers with extensive experience using other computer applications are probably more effective searchers than those who are unfamiliar with computers. Section 3 asked about the purpose of, and satisfaction with, the current search. It also asked respondents to indicate how often they had searched using CD-ROMs in the past. We used this section minimally in our analysis. Section 4, the most important section of the questionnaire, identified the types of CD-ROM training and assistance that the respondents had previously received. Because we were trying to identify the most effective types of assistance and instruction, this last section of the survey contained thirty categories, which included various types of classroom instruction, as well as other forms of instructional assistance, classified by time and location of instruction.

The second part of the data collection involved the respondents' search strategy. Though the survey data were subject to the usual problems of self-reported data, we determined the search skill level based on students' actual search strategies. One of the authors coded all the strategies for the number of different Boolean operators, field searches, and referrals to previous search terms used. In the following discussion, references to "operators" or "Boolean operators" should be understood to include the concepts of field searches and referrals to previous search statements. Although we recognize that the use of a variety of search operators is not always necessary for a good or useful search, correct use of a variety of operators is a clear indication of knowledge of, or skill at, searching and should directly relate to good searching. In addition, these elements are easy to measure objectively.

The Survey Population
Although we had hoped to collect surveys from a representative cross section of the population that uses the University at Albany's CD-ROMs, the persons participating in the survey were predominantly female (almost 66%) and were overwhelmingly involved in research in the social sciences (over 28% in psychology, over 21% in education, and over 14% in other social science disciplines) (see Table 1).

In other words, over 60 percent of those included in the survey were working in one of these three areas. We cannot say for certain how representative our survey

| TABLE 1
Summary of Characteristics for Survey Respondents |
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Age % of respondents</td>
<td></td>
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<tr>
<td>0–17</td>
<td>0.6</td>
</tr>
<tr>
<td>18–25</td>
<td>59.3</td>
</tr>
<tr>
<td>26–34</td>
<td>22.1</td>
</tr>
<tr>
<td>35 or older</td>
<td>17.9</td>
</tr>
<tr>
<td>Missing</td>
<td>0.1</td>
</tr>
<tr>
<td>Sex % of respondents</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>66.0</td>
</tr>
<tr>
<td>Male</td>
<td>34.0</td>
</tr>
<tr>
<td>Major/dept. % of respondents</td>
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</tr>
<tr>
<td>Agriculture</td>
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</tr>
<tr>
<td>Area Studies</td>
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</tr>
<tr>
<td>Biological Scis.</td>
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<tr>
<td>Business &amp; Mgt.</td>
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<tr>
<td>Communications</td>
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</tr>
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<td>Comp. &amp; Info. Sci.</td>
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</tr>
<tr>
<td>Education</td>
<td>21.5</td>
</tr>
<tr>
<td>Fine &amp; Applied Arts</td>
<td>0.4</td>
</tr>
<tr>
<td>Foreign Language</td>
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<tr>
<td>Health Professions</td>
<td>1.5</td>
</tr>
<tr>
<td>Humanities</td>
<td>8.3</td>
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<tr>
<td>Library Sciences</td>
<td>0.1</td>
</tr>
<tr>
<td>Mathematics</td>
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<tr>
<td>Physical Sciences</td>
<td>1.0</td>
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<td>Psychology</td>
<td>28.6</td>
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<tr>
<td>Public Affairs</td>
<td>4.9</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>14.5</td>
</tr>
<tr>
<td>Interdisciplinary</td>
<td>0.3</td>
</tr>
<tr>
<td>University Admin.</td>
<td>0.9</td>
</tr>
<tr>
<td>Not Applicable</td>
<td>1.2</td>
</tr>
<tr>
<td>Missing Data</td>
<td>4.3</td>
</tr>
</tbody>
</table>
TABLE 2
Cross-tabulation of Training by Skill Level

<table>
<thead>
<tr>
<th></th>
<th>None or Incorrect Use</th>
<th>Low Skill Level</th>
<th>Moderate Skill Level</th>
<th>High Skill Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever-trained</td>
<td>56</td>
<td>60</td>
<td>98</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>19.5%</td>
<td>20.9%</td>
<td>34.1%</td>
<td>25.4%</td>
</tr>
<tr>
<td>Never-trained</td>
<td>116</td>
<td>106</td>
<td>111</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>29.9%</td>
<td>27.3%</td>
<td>28.6%</td>
<td>14.2%</td>
</tr>
</tbody>
</table>

Although a low skill level was exhibited by 20.9 percent of those who had received instruction and 27.3 percent of those who had not, a moderate level of skill was used by 34.1 percent of those having received instruction and 28.6 percent of those who had not.

is because no previous survey has been done to explore the demography of our CD-ROM users. However, with the exception of the gender breakdown, these figures closely reflect our overall user population and use of our SilverPlatter databases. A majority of our graduate students (73.7%) are in the social sciences, as are 30.8 percent of undergraduates who have declared majors (almost half of our undergraduates are undecided or not in a program). Overall, 44 percent of the students are in the social sciences. This is

less than in our study population, but a large percentage of those who are undeclared are taking courses in the social sciences. The survey population includes a higher percentage of females than does our campus population, where 47.9 percent of undergraduates and 58.5 percent of graduate students are female. This representation, interestingly, is at odds with research reviewed by Elizabeth Cardman in her article on computer use and gender.

Statistics on overall database use for the period of the study (February through May 1994) show that use of ERIC and PsycLIT closely reflects the survey population: 26.1 percent of all searches done on SilverPlatter databases were conducted on PsycLIT, and 22 percent were conducted on ERIC.

As for age distribution, over 59 percent of the respondents were between eighteen and twenty-five years old, over 22 percent were between twenty-six and thirty-four, and almost 18 percent were over thirty-five. Most of those participating in the survey were graduate students (53.6%) or undergraduate students (40.9%). A huge majority (over 96%) indicated that they had some computer experience outside the library. In addition, in keeping with previous surveys, over 78 percent indicated that they thought the results of their search were valuable (with another 18 percent indicating that they did not yet know). Although we did not keep an exact count, very few of the people approached refused to complete the survey.

Results
The authors coded and analyzed responses to the survey through the use of the statistical package SPSS. We created a measure of the level of success of searching (in this case determined by the successful use of Boolean operators) by collapsing all the possible combinations of use of Boolean operators into three distinct categories. The first category—high skill level—included those persons who used three or more Boolean operators in their search; the second category—moderate skill level—included all those who used two Boolean operators; and the third category—low skill level—included all those who used one operator. We treated persons who used no operators or who only used incorrect operators separately in the analysis.
The authors then performed cross-tabulations on all the important measures. We compared "ever-trained" with "never-trained" searchers, and combined all the measures pertaining to any sort of end-user training into one category. The authors treated respondents who indicated they had never had any kind of training or class instruction on CD-ROM searching as another category. Although a low skill level was exhibited by 20.9 percent of those who had received instruction and 27.3 percent of those who had not, a moderate level of skill was used by 34.1 percent of those having received instruction and 28.6 percent of those who had not. Furthermore, almost twice as many of those who had prior instruction used the high level of search skill as defined in our study (25.4%), compared to those who received no instruction (14.2%) (see table 2 and figure 1).

To study the relationship between the two variables of class instruction and skill level indicated by the search strategy, we first examined the various row percentages in the cross-tabulations (the percent at each skill level divided between those who had had instruction and those who had not). We then conducted a chi-square test to see if there was a statistically significant relationship between the two variables. The chi-square for the measure of class instruction by the measure of search skill-level cross-tabulation resulted in a value of 22.4 (df=3, p<.05), indicating a significant relationship. Cramer's V was then used to determine the strength of the relationship. The value from this test "ranges from 0 to +1; the larger the value of V, the greater is the association in the variables." The measure of the association was 0.182, indicating a weak association. We next considered each type of instruction as an individual measure and performed cross-tabulations. These cross-tabulations showed no statistically significant relationships between type of training and skill level.

![FIGURE 1](image-url)

**FIGURE 1**

Relationship between Training and Skill Level

- **Some Training**
- **No Training**
The authors also performed cross-tabulations that did not involve instruction. We compared user group with skill level, combining the University at Albany and non-University at Albany respondents in each category. Even though five cells did not contain at least five items, a requirement for a statistically valid chi-square analysis, the results were revealing (see table 3). Faculty do the highest percentage of searches using incorrect or no operators. Staff and graduate students do the most searches indicating a moderate skill level, whereas staff members perform the most searches using a high skill level. Undergraduate students hover at about 30 percent for the three lower skill levels, but drop to 12.9 percent for high-skill level searches (see figure 2). The chi-square for the measure of user group by the measure of skill-level cross-tabulation

<table>
<thead>
<tr>
<th>TABLE 3</th>
<th>User Groups by Skill Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None or Incorrect Use</td>
</tr>
<tr>
<td>Faculty</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>45.5%</td>
</tr>
<tr>
<td>Graduate</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>21.6%</td>
</tr>
<tr>
<td>Undergrad.</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>28.3%</td>
</tr>
<tr>
<td>Staff</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>26.7%</td>
</tr>
</tbody>
</table>

Chi-square 25.5 (df=9, p<.05)

FIGURE 2
User Group Percentages vs. Skill Level

--- Faculty + Graduate + Undergrad + Staff
resulted in a value of 25.5 (df=9, p<.05), indicating a significant relationship. Cramer’s V was 0.113, signifying a weak association.

We also compared department affiliation/major with skill level. In order to obtain an adequate count in each category, we collapsed departments into four broad areas: sciences, social sciences/business, humanities, and area studies. This combination of departments still resulted in two cells with fewer than five items, so the conclusions should be viewed with caution (see table 4). Searchers affiliated with departments in the humanities and area studies did the most searches using no operators or using operators incorrectly, and had the fewest high skill-level searches (see figure 3). Although this might suggest that these users would benefit most from instruction, it should be noted that, for the humanities, our only

<table>
<thead>
<tr>
<th>Department/Major by Skill Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>None or Incorrect Use</td>
</tr>
<tr>
<td>Science</td>
</tr>
<tr>
<td>21.7%</td>
</tr>
<tr>
<td>Social Sci./Business</td>
</tr>
<tr>
<td>21.6%</td>
</tr>
<tr>
<td>Humanities</td>
</tr>
<tr>
<td>53.1%</td>
</tr>
<tr>
<td>Area Studies</td>
</tr>
<tr>
<td>47.8%</td>
</tr>
</tbody>
</table>

Chi-square 39.5 (df=9, p<.05)
SilverPlatter database is the MLA Bibliography. Although not all humanities-affiliated searchers would necessarily have used MLA, those that did were often searching the title of a literary work or an author’s name—searches that do not always require operators to be good searches. The chi-square for the measure of department affiliation by the measure of skill-level cross-tabulation resulted in a value of 39.5 (df=9, p<.05), indicating a significant relationship. Cramer’s V was 0.247 in the range from 0 to 1.

Neither age nor sex showed a relationship with search skill. However, when the age categories zero to seventeen and eighteen to twenty-five were combined to provide sufficient frequencies in each cell, we did note that there was a larger differentiation in the skill levels of trained searchers in the twenty-six to thirty-four age range. Of those searchers who used no operators or who used them incorrectly, 17.4 percent fell into this age range. Of those who had a low skill level, 23.5 percent were between twenty-six and thirty-four. Of those with a moderate skill level, 21 percent were in this age range, and 28.4 percent of those with a high skill level were between twenty-six and thirty-four. The percentages in the zero to twenty-five and the thirty-five-plus age ranges stayed more constant across skill levels.

In asking survey respondents how many times they had searched CD-ROMs in the past, we hypothesized that those who were frequent searchers would have the best search strategies. Although 31.3 percent of those who had never searched before did not use any operators or used them incorrectly, there was not a clear trend in increased operator use among those who had never searched through the most experienced searchers. In addition, whereas 19.7 percent of the most experienced searchers did the best searches, so did 18.8 percent of the new searchers (see table 5). Similarly, experience in online catalog searching, use of interactive learning software, online database searching, and e-mail experience did not relate to search competency.

Conclusions
Our hypothesis—that patrons who had attended searching classes or who had been directly assisted by librarians (or trained library assistants) would be far more sophisticated searchers—seems to be correct based on one test, but additional research should be undertaken before we can state with resounding affirmation that classes help students. Several of the analyses of the results of this study showed no statistically significant relationships between the skill level and other variables. The chi-square test did demonstrate that there is a positive association between class instruction and more skillful searching; however, based on our Cramer’s V test result, class instruction makes a less pronounced difference than we expected. None of the other individual instruction analyses detected statistically significant associations, in part because insufficient data existed. In retrospect, we realize that the last section of the ques-

<table>
<thead>
<tr>
<th>Prior Use of CD-ROMs by Skill Level</th>
<th>None or Incorrect Use</th>
<th>Low Skill Level</th>
<th>Moderate Skill Level</th>
<th>High Skill Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>15</td>
<td>14</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>1 time</td>
<td>10</td>
<td>14</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>2-5 times</td>
<td>40</td>
<td>43</td>
<td>52</td>
<td>24</td>
</tr>
<tr>
<td>6 or more times</td>
<td>107</td>
<td>95</td>
<td>132</td>
<td>82</td>
</tr>
</tbody>
</table>

|                           | 25.7%                 | 22.8%          | 31.7%               | 19.7%           |
The questionnaire was too complex to net sufficient responses in any specific category to allow for a useful analysis. If we were to repeat this study, we would only differentiate hands-on versus demonstration classes during the current semester or an earlier semester.

The first question librarians need to ask after reviewing this research is: Are public service librarians spending their time wisely teaching and assisting end-users? The answer, we believe, is yes. This study involved only the use of Boolean operators, field searching, and referrals to previous search statements, and not other search skills. It is possible that Boolean operators are the most “foreign” concepts; the least easily grasped of any that librarians try to impart. Possibly the amount of information presented in instruction sessions overwhelms patrons. When teaching the local setup, the concept of a database, the variety of databases available, and specific searching techniques, much is bound to be lost. In addition, if students learn little but become comfortable with CD-ROM technology or with the library in general, our work is clearly purposeful.

Thus, although we do not believe that the results of our research refute the importance of CD-ROM instruction and assistance, we do believe the results make a persuasive case for more research into the issues we’ve explored. If there isn’t a strong association between what we are teaching and what end users are learning, we need to discover why. We need to know how much end users are motivated to learn search skills (perhaps their high satisfaction level with any search, however poor, prevents them from appreciating the value of instruction) or if the software itself somehow leads end users away from employing more sophisticated search skills. Most important, we need to discover if our teaching and assistance techniques are inappropriate for the technology.

Notes


Research Notes

Earnings Determinants of Library Faculty of the University System of Georgia

W. Ken Farr and R. Neil Scott

This study analyzes the effects of selected factors on earnings of library faculty employed at senior colleges of the University System of Georgia with a master of library science degree. The factors are also dissected to explore for any differences in their impacts on earnings by gender. Major findings are that earnings increase with experience, becoming a library director, greater supervisory responsibility, and higher academic rank, whereas a decrease in salary can be expected upon changing jobs. Results from the study also suggest that male and female library faculty earnings are determined in the absence of gender discrimination. A surprising finding is that intellectual contributions and additional graduate education are not directly rewarded with significant increases in earnings.

The major objectives of this paper are twofold. First, a model is developed to explore the influence of human capital, institutional, and personal characteristics on the compensation of library faculty employed by senior colleges of the University System of Georgia. A multiple regression analysis is employed to find the statistically significant factors that influence the earnings of members of this population. Second, even though the study is conducted within the limitations of a segment of the larger universe of academic libraries in the United States, a major contribution of this paper is that it can serve as a model for other colleges and universities (or groups of such institutions) that wish to study the structure of their own compensation systems.

Other benefits of conducting studies such as this one are that results can be used as a basis from which to lobby to correct compensation discrepancies and/or to develop a formula-based salary scale to reward activities and attributes of library faculty in a more predictable manner. Researchers constructed an example of such a formula at Lamar University. 1

Readers interested in a more basic, descriptive analysis of the original survey from which the data of this study were gathered are referred to the authors' previous article in Southeastern Librarian. 2

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Review of the Literature

In a nondiscriminating competitive labor market, marginal productivity theory suggests that wage differences depend largely upon differences in the productivity of labor. Other things being equal, higher incomes are generally expected to be associated with factors (e.g., education and experience) that enhance a person's labor productivity and vice versa. However, in real-world labor markets, market imperfections may also contribute to income differences between individuals in specific labor markets because an individual's factor endowments may be evaluated differently based on, for example, gender or race. In addition, wage differences of individuals may also reflect other factors that limit market participation, such as specific job qualifications.

Previous studies have found that wages in the academic setting are, in general, significantly determined by such institutional factors as intellectual activities, job performance, experience, and administrative responsibilities. However, earlier studies focused attention primarily on "traditional" academic faculty, thus the role that these factors play in determining the earnings of library faculty is unclear as rewards for factor endowments are often market specific. The authors, however, believe that it is reasonable to assume, a priori, that similar factors would also be important in explaining earnings variations in the academic labor market for library faculty. Support for this argument is found in human capital theory which asserts that, through time, individuals accumulate skills that enhance the productivity of our labor services, based upon our education levels and work experience.

This assertion is further supported by the "Standards for Faculty Status for College and University Librarians" adopted and promoted by ACRL. In recognition of these standards, which encourage equal treatment of academic library faculty with other comparably ranked instructional faculty, librarians employed by the University System of Georgia hold faculty status and are fully recognized by the Board of Regents as members of the "Corp of Instruction" at each institution. Another basis for this assumption may be found in results from a dissertation which concluded that many of the same factors that influence academic faculty salaries in other disciplines are similar for academic librarians employed at medium-sized state-supported universities in the midwestern United States.

Description of the Survey and Data

The data used in this study were collected during the summer and fall of 1992 as part of a survey of all library faculty employed by the fourteen senior colleges of the University System of Georgia (a population of 95). The authors gathered data from a tailored questionnaire designed to obtain descriptive information while maintaining personal confidentiality. The authors limited the data set to librarians with academic rank who possess an ALA-accredited master's degree in library science (MLS) since the ALA master's degree is the minimum education level for those accepted for employment as a library faculty member in the University System of Georgia. The data were current for the budget year ending June 30, 1992. The final sample consisted of sixty-eight usable questionnaires, reflecting a response rate of 72 percent.

Primary Model Specification

The traditional human capital model forms the basis for the factors included to explain income variations of library faculty. In addition to factors indicating investments in human capital (HC), this conventional model is expanded to capture the effects of administrative responsibilities (A), rank (R), and personal characteristics (P). Also, since other studies have shown that earnings may vary by gender, this possibility is also explored.
The formal model is expressed as follows:

$$y_i = f(HC_i, A_i, R_i, P, e_i) \quad i = 1, \ldots, T$$ (1)

where each component is explained as follows:

The term $y_i$, the dependent variable, is the natural logarithm of the annual (12-month) salary of the $i$th library faculty member. The reason for the logarithmic form of salary is because of its preponderance in similar academic studies as there is no strong theoretical support for the exact functional form of the dependent variable. In an effort to improve response rates, wage information was gathered using categorical choices and the midpoint of each category was used as an approximation of salary.21

The explanatory variables begin with $HC$, which represents three human capital measures of the $i$th library faculty member. The first is experience, a continuous variable that measures the number of years since receiving the MLS degree. The second is publications, a weighted composite continuous variable that represents the cumulative intellectual output of the $i$th library faculty member during his or her career. A weighting scheme is used to reduce the number of independent variables and increase the degrees of freedom in the regressions models. The weights assigned to specific intellectual activities are: published books by a factor of 5; published academic research articles by a factor of 2.5; academic research papers presented at professional organization meetings by a factor of 1.25; book reviews by a factor of .625; and any other "intellectual" activity reported in the survey by a factor of .3125. Although any weighting scheme is subjective and there is always the problem of evaluating quality versus quantity, the authors believe that the above scale is consistent in terms of the importance assigned to intellectual activities for academic librarians. In addition, weighting schemes such as the one described have been shown to be useful in similar empirical studies.22,23 No attempt was made to adjust this variable to differentiate between single and joint authorship. The third and final human capital variable is used to capture the effects of a specialized subject degree. This is a dichotomous variable with a value of one if the $i$th library faculty member has one or more graduate subject degrees in addition to the MLS, zero if otherwise. This variable is included to capture benefits associated with additional degrees where it is expected that a supplemental degree(s) would enhance the operation of the library in that field. Each of the above variables is expected to have a positive impact on salary since each reflects an increase in human capital.

The next explanatory component is $A_i$, which represents two administrative measures. The first is a dichotomous variable that takes a value of one if the $i$th library faculty member is the director of the library, zero if otherwise. This variable is included to capture the expected positive influence on salary of an individual ultimately responsible for the operation of a college library. The second administrative variable is used to measure supervisory responsibilities of the $i$th library faculty member. This is a weighted composite continuous variable where the number of professional library faculty supervised is weighted by a factor of 1, the number of support staff supervised is weighted by a factor of .5, and the number of student assistants supervised is weighted by a factor of .25. This weighting scheme is again used to reduce the number of explanatory variables and increase the de-
degrees of freedom. It is also used to attach importance to the type as well as the number of individuals supervised. As before, any weighting scheme is subjective and subject to debate. However, the authors believe that this scheme, as designed, is consistent with the importance assigned to levels of supervisory responsibility for library faculty. A positive impact on earnings is expected from both of these administrative measures.

The term \( R_i \) is included to represent the three academic ranks of assistant professor, associate professor, and full professor. Each is a dichotomous variable where a value of one is assigned according to the \( i \)th library faculty member’s rank, zero if otherwise. These variables are included to capture rewards that are given for an amalgam of achievements accumulated by an individual during his or her career which are not explicitly accounted for in the model or which individually would not have a significant impact on wages. In association with an increase in rank often comes an increment in one’s salary. It is therefore expected that each of these variables would have a positive impact on salary.

The final explanatory component of the model is \( P_i \) which represents two personal characteristic measures. The first is the number of library employers (excluding the first employer) of the \( i \)th library faculty member during his or her years of employment since receiving the MLS degree. This continuous variable is included based upon the hypothesis that individuals who change their employer more frequently, do so to enhance their salary. While economic theory does not provide direct evidence of the likely effect of this variable, other studies have found mobility to be a significant positive earnings determinant in academia.\(^\text{24,25}\) The second personal characteristic variable is gender, a dichotomous variable that takes a value of one if the \( i \)th library faculty member is male, zero if otherwise. This variable is included to assist in exploring for gender bias in library faculty earnings. If differences exist in starting pay, other things constant, and/or if differences exist in how factor endowments are evaluated for salary, gender discrimination may be the cause. Conversely, discrimination cannot be argued if differences in earnings are explained by factor endowments. A methodology to explore for this possibility is developed in the next section.

The component \( e_i \) is a random disturbance term included to capture any unexplained variation in earnings not accounted for by the explanatory variables.

**Model Decomposition**

To investigate for differences in library faculty salaries by gender, begin by decomposing the earnings model into its component parts, as suggested by Alan Blinder.\(^\text{26}\) To simplify this procedure, first rewrite equation (1) in more general terms as:

\[
y_i = \alpha + \sum_{j=1}^{n} \beta_j z_{ij} + e_i \quad i = 1, \ldots, T (2)
\]

where \( y_i \) is the salary received by the \( i \)th individual, \( z_{ij} \) represents factor endowment values taken by the \( j \)th explanatory variables of the \( i \)th individual, \( \alpha \) and \( \beta_j \) represent unknown parameter coefficients to be estimated using least squares, and \( e_i \) is a stochastic disturbance term. Equation (2) can be rewritten to represent a male or female sample as:

\[
\bar{y}^m = \hat{\alpha}^m + \sum_{j=1}^{n} \hat{\beta}_j^m \bar{z}_m
\]

\[
\bar{y}' = \hat{\alpha}' + \sum_{j=1}^{n} \hat{\beta}_j' \bar{z}_j
\]

where \( \hat{\alpha} \) and \( \hat{\beta} \) represent estimates of the unknown parameters in equation (2), the \( m \) and \( f \) superscripts refer to results from a sample of males or females, and the bar superscripts refer to sample means.
Total differences in the average salaries of males and females can therefore be shown as:

$$\bar{y}^m - \bar{y}^f = (\hat{\alpha}^m - \hat{\alpha}^f) + \sum_{i=1}^{n} \hat{\beta}_i^m (Z_i^m - Z_i^f) + \sum_{i=1}^{n} Z_i^f (\hat{\beta}_i^m - \hat{\beta}_i^f)$$  \(5\)

where \((\bar{y}^m - \bar{y}^f)\), which is referred to as the total effect of the average salary differences, decomposes into the sum of three components: the constant effect, the endowment effect, and the coefficient effect, respectively. To explain each component, first assume that salaries of female library faculty are determined in the absence of discrimination. This can be expressed as:

$$\bar{y}^h = \hat{\alpha}^m + \hat{\beta}_i^m Z_i^f$$  \(6\)

where \(\bar{y}^h\) represents female mean salaries when factor endowments of females are evaluated using the rewards structure for males. Earnings variations that are explained by differences in average factor endowments can then be shown as:

$$\bar{y}^m - \bar{y}^h = \sum_{i=1}^{n} \hat{\beta}_i^m (Z_i^m - Z_i^f)$$  \(7\)

which is the endowment effect shown in equation (5). Any remaining difference in total earnings between male and female library faculty is then referred to as the residual effect, defined as the difference between \((\bar{y}^h - \bar{y}^f)\) and shown as:

$$\bar{y}^h - \bar{y}^f = (\hat{\alpha}^m - \hat{\alpha}^f) + \sum_{i=1}^{n} Z_i^f (\hat{\beta}_i^m - \hat{\beta}_i^f)$$  \(8\)

where the residual effect is the sum of the constant and coefficient effect in equation (5). The constant effect represents earnings differentials unrelated to factor endowment levels or the evaluation of said endowments for income determination. The coefficient effect, conversely, represents earnings variations as a result of the differences in how factor endowments are evaluated. This suggests that even if both male and female library faculty had \(Z_i\), factor endowments, earnings differences would still exist. Given this, an argument for traditional gender discrimination may be made if the constant and/or coefficient effect is significant and of the appropriate sign, which in this context is expected to be positive since it is generally assumed that males earn more than females in comparable positions.

Using the methodology of John Jackson and James T. Lindley, a statistical test for significance of the residual effect can be accomplished by combining the male and female sample data on the variables in equation (1). A dichotomous variable to represent gender is included, as well as a complete set of gender interaction terms. The residual effect can be tested assuming the null hypothesis of no significant differences in earnings by gender using the following test statistic:

$$u = \frac{(SSE_r - SSE_u)}{J}$$  \(9\)

where SSE<sub>r</sub> is the sum of squares of the least squares errors obtained from the restricted model excluding the gender and interaction terms, and SSE<sub>u</sub> is the sum of squares of the least squares errors obtained from the unrestricted model which includes the gender and interaction terms. J represents the number of joint hypotheses being tested; K, the number of parameters estimated in the unrestricted model; and T, the sample size. The test statistic \(u\) follows an F distribution with J and \((T - K)\) degrees of freedom.

The components of the residual effect can also be tested for statistical significance. This is done by testing for the coefficient effect using the same procedure as above, except the gender dummy is
The empirical evidence suggests that the greatest addition to earnings comes from being a library director.

Presentation and Analysis of Results

Table 1 presents parameter estimates of five separate regressions related to equation (1). All five are necessary to accomplish the objectives of the study since each contains information that is needed for statistical analysis.

Overall, each equation is statistically significant at the \( \alpha = .01 \) level, with the lowest estimated \( R^2 \) of .85 for the female model. This suggests that the specified model does an acceptable job of explaining wage variations of library faculty. Exploring for significant differences in salary by gender begins by reviewing the parameter estimates from the male and female regressions (see columns 1 and 2). These suggest that several common factors significantly influence salary, including experience, appointment as library director, supervisory responsibility, and the rank of associate professor. However, differences are also shown to exist. Additional significant variables for the males regression include publications, the rank of assistant professor, and the number of past employers. An additional significant variable for the females regression is the rank of full professor. Other differences include the intercepts of the two regressions, which suggest a lower starting salary for females, and the magnitude of the coefficients on the explanatory variables, which imply differences in how unit changes in these variables impact salary. While differences appear to exist, the question becomes: are the visible differences statistically significant?

The answer to this question is given at the bottom of table 1 where the estimated mean salary of men \( (\bar{y}_m) \) is shown to be only 4.63 percent higher than for women \( (\bar{y}_f) \), which was defined earlier to be the total effect. Roughly 28 percent of this difference is explained by factor endowments (the endowment effect), while the remaining 72 percent (the residual effect) is a result of other causes. Using equation (9), a test of statistical significance on the residual effect is performed and found to be insignificant. In addition, a test of the differences in starting pay (the constant effect) is also shown to be insignificant. Moreover, the evaluation of factor endowments that determine salary (the coefficient effect) is not significantly different between the sexes. Results of these tests suggest that there are no significant differences in the earnings of library faculty by gender that cannot be explained in economic terms. As such, the two groups can be "pooled" and treated as identical within the context of the regression model. The appropriate regression for further analysis then becomes the pooled model without gender dummy or interaction terms (see column 3).

Regression (3) results in table 1 are summarized in dollar equivalents in figure 1. These estimates show that an individual with an MLS from an ALA-accredited program holding the rank of instructor in a senior college of the University System of Georgia with zero values for the explanatory variables would have had a starting
### TABLE 1

**Earnings Model Parameter Estimates**  
(t-values are given in parentheses)

<table>
<thead>
<tr>
<th>Variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>Males Means</th>
<th>Females Means</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Constant</strong></td>
<td>Males Model</td>
<td>Females Model</td>
<td>Pooled Model No Gender Dummy</td>
<td>Pooled Model Gender Dummy</td>
<td>Pooled Model Gender and Interaction</td>
<td>Males Means</td>
<td>Females Means</td>
</tr>
<tr>
<td></td>
<td>(205.6)</td>
<td>(224.9)</td>
<td>(333.0)</td>
<td>(310.4)</td>
<td>(224.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Human Capital Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>0.0110</td>
<td>0.0075</td>
<td>0.0087</td>
<td>0.0084</td>
<td>0.0075</td>
<td>12.600</td>
<td>12.875</td>
</tr>
<tr>
<td></td>
<td>(3.466)</td>
<td>(2.303)</td>
<td>(4.183)</td>
<td>(3.981)</td>
<td>(2.303)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>0.0052</td>
<td>-0.0013</td>
<td>0.0012</td>
<td>0.0013</td>
<td>-0.0013</td>
<td>5.906</td>
<td>7.129</td>
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<tr>
<td></td>
<td>(2.290)</td>
<td>(-0.996)</td>
<td>(1.124)</td>
<td>(1.175)</td>
<td>(-0.996)</td>
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<tr>
<td>Subject Degree</td>
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<td>-0.0027</td>
<td>-0.0129</td>
<td>0.0067</td>
<td>0.550</td>
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<td>(-1.654)</td>
<td>(0.150)</td>
<td>(-0.114)</td>
<td>(-0.509)</td>
<td>(0.150)</td>
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<td></td>
</tr>
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<td><strong>Administrative Variables</strong></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Director</td>
<td>0.3611</td>
<td>0.3840</td>
<td>0.3324</td>
<td>0.3423</td>
<td>0.3840</td>
<td>0.150</td>
<td>0.167</td>
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<tr>
<td></td>
<td>(5.232)</td>
<td>(6.311)</td>
<td>(8.556)</td>
<td>(8.627)</td>
<td>(6.312)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervisory Responsibility</td>
<td>0.0112</td>
<td>0.0138</td>
<td>0.0102</td>
<td>0.0092</td>
<td>0.0138</td>
<td>6.163</td>
<td>3.250</td>
</tr>
<tr>
<td></td>
<td>(3.021)</td>
<td>(2.871)</td>
<td>(4.780)</td>
<td>(4.802)</td>
<td>(2.872)</td>
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<tr>
<td>Assistant Professor</td>
<td>0.1150</td>
<td>0.0492</td>
<td>0.0847</td>
<td>0.0897</td>
<td>0.0492</td>
<td>0.400</td>
<td>0.479</td>
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<tr>
<td></td>
<td>(2.183)</td>
<td>(0.999)</td>
<td>(2.727)</td>
<td>(2.685)</td>
<td>(0.998)</td>
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</tr>
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<td>Associate Professor</td>
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<td>0.1607</td>
<td>0.1674</td>
<td>0.1792</td>
<td>0.1607</td>
<td>0.250</td>
<td>0.250</td>
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<tr>
<td></td>
<td>(2.194)</td>
<td>(2.505)</td>
<td>(3.831)</td>
<td>(4.005)</td>
<td>(2.506)</td>
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<tr>
<td>Full Professor</td>
<td>0.0636</td>
<td>0.4280</td>
<td>0.2387</td>
<td>0.2465</td>
<td>0.4280</td>
<td>0.050</td>
<td>0.042</td>
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<tr>
<td></td>
<td>(0.449)</td>
<td>(3.461)</td>
<td>(3.003)</td>
<td>(3.089)</td>
<td>(3.461)</td>
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<td></td>
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<td><strong>Personal Variables</strong></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Number of Employers</td>
<td>-0.0539</td>
<td>-0.0094</td>
<td>-0.0172</td>
<td>-0.0160</td>
<td>-0.0094</td>
<td>2.350</td>
<td>2.708</td>
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<td></td>
<td>(-2.242)</td>
<td>(-1.150)</td>
<td>(-2.303)</td>
<td>(-2.126)</td>
<td>(-1.150)</td>
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<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.0307</td>
<td>0.0767</td>
<td>0.294</td>
<td>0.706</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Dummy</td>
<td>(1.224)</td>
<td>(1.150)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Gender Interaction Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Gender-Experience</td>
<td>0.0035</td>
<td>(0.777)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Gender-Publications</td>
<td>0.0065</td>
<td>(2.476)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Gender-Subject Degree</td>
<td>-0.0662</td>
<td>(-1.153)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender-Director</td>
<td>-0.0229</td>
<td>(-0.249)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Gender-Supervisory Responsibility</td>
<td>-0.0026</td>
<td>(-0.424)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Gender-Assistant</td>
<td>0.0657</td>
<td>(0.911)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Professor</td>
<td>-0.0012</td>
<td>(-0.013)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Gender-Associate</td>
<td>-0.3644</td>
<td>(-1.937)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Professor</td>
<td>-0.0445</td>
<td>(-1.751)</td>
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</table>
| Gender-Number of Employers      |             |             |             |             |             |             |               | (Cont.)
TABLE 1 cont.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Males Model</th>
<th>Females Model</th>
<th>Pooled Model No Gender</th>
<th>Gender Dummy</th>
<th>Pooled Model Gender Dummy</th>
<th>Gender and Interaction</th>
<th>Males Means</th>
<th>Females Means</th>
</tr>
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<tbody>
<tr>
<td>F-value</td>
<td>36.0400a</td>
<td>23.7940a</td>
<td>50.9930a</td>
<td>46.2800a</td>
<td>28.5470a</td>
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<tr>
<td>R-squared</td>
<td>0.97010</td>
<td>0.84930</td>
<td>0.88780</td>
<td>0.89030</td>
<td>0.91870</td>
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<td></td>
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<tr>
<td>M.S.E.</td>
<td>0.00436</td>
<td>0.01353</td>
<td>1.00000</td>
<td>1.00000</td>
<td>1.00000</td>
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<tr>
<td>S.S.E.</td>
<td>0.04356</td>
<td>0.51423</td>
<td>0.71417</td>
<td>0.70541</td>
<td>0.55779</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>20</td>
<td>48</td>
<td>68</td>
<td>68</td>
<td>68</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean In Salary</td>
<td>10.36952</td>
<td>10.32420</td>
<td>10.33753</td>
<td>10.33753</td>
<td>10.33753</td>
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<table>
<thead>
<tr>
<th>Differences in Logarithms</th>
<th>Percentage Differences in Nominal Terms</th>
</tr>
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<tbody>
<tr>
<td>$y^m = 10.3695$</td>
<td>Total Effect = $y^m - y^f = .0453$</td>
</tr>
<tr>
<td>$y^b = 10.3569$</td>
<td>Endowment Effect = $y^m - y^b = .0126$</td>
</tr>
<tr>
<td>$y^r = 10.3242$</td>
<td>Residual Effect = $y^r - y^f = .0327$</td>
</tr>
</tbody>
</table>

Constant Effect = Gender coefficient in the full Interaction Model = 0.76649
Coefficient Effect = Residual Effect - Constant Effect = 0.0327 - 0.076649 = -0.043949

u for Residual Effect = [(.71417 - .55779) / 10] / [.55779 / (68 - 20)] = 1.3457
F critical = 2.0346 (α = .05)
u for Coefficient Effect = [(.70541 - .55779) / 9] / [.55779 / (68 - 20)] = 1.41147
F critical = 2.0817 (α = .05)

a Significant at the α = .01 level
b Significant at the α = .05 level
c Significant at the α = .10 level


Among the human capital factors included in the model, only experience is found to be statistically significant. Regression estimates show that earnings increase with each year of experience by a nominal .87 percent, or $208 per year. Both of the administrative variables are found to significantly improve salaries. The position of library director is estimated to enhance earnings by a nominal 39.43 percent, or $9,441. Responsibility for directly supervising employees is estimated to increase salary by $245 for each professional library faculty member supervised, $123 for each support staff member supervised, and $61 for each student supervised.

All academic ranks are found to be statistically significant. Salary increases nominally with the rank of assistant professor by approximately 8.8 percent, or $2,116, over the salary of an instructor. Likewise, the rank of associate professor is associated with a salary increase of a nominal 18.2 percent, or $4,363, over the rank of instructor. For a full professor the increase is 26.9 percent, or $6,455.

The last factor found to be statistically significant is the number of employment changes. While many other studies found this variable to positively increase earnings, estimates show that each employment change since receiving the ALA-accredited MLS degree causes salary to decrease nominally by 1.7 percent, or $409. This suggests that library faculty change jobs for reasons ranked higher in importance than earnings. Moreover, regardless of the reason for the job change, the library faculty in this study had to accept significantly lower salaries when changing employers.

Summary and Conclusions
This earnings study of library faculty em-
ployed by senior colleges of the University System of Georgia found no evidence to suggest that gender discrimination plays any role in determining salary. In other words, the same set of factors is significant in determining salary for both males and females, as well as how they are evaluated in setting salaries.

The significant factors found to increase earnings for library faculty are experience, administrative responsibilities, and faculty rank. The empirical evidence suggests that the greatest addition to earnings comes from being a library director. This conclusion is not unexpected since the individual in this position is ultimately responsible for the overall day-to-day operations of the library. However, results also indicate that significant increases in salary can also be achieved by those individuals who are not library directors by assuming additional supervisory responsibilities.

Experience is another factor found to increase earnings significantly. Interestingly, the evidence suggests that earnings increase linearly with experience, vis-à-vis, as theoretically expected in a nonlinear fashion. Because human capital theory suggests that with greater experience comes greater productivity, the study's empirical evidence is unclear as to the exact economic interpretation of experience's impact on earnings. Does salary increase with experience because of increased productivity or simply because of longevity? This issue warrants further study.

The significance of faculty rank variables explains the rewards given to individuals based on a composite of factors not specifically included in the study or which individually do not affect salary.

---

**FIGURE 1**

1992 Fiscal Year Salary Estimate of College Librarians in the University System of Georgia Based on the Results of This Study

| I. Base pay of ALA-accredited MLS academic library faculty member with rank of instructor: | $23,945 |
| II. **Add:** $208 for each year of post-MLS experience: | ($208 X ___ Years) = +______ |
| $9,441 if hold position of library director: | ($9,441) = +______ |

Number of people directly supervised:

- ($245 X ___ faculty) = +______
- ($123 X ___ support staff) = +______
- ($61 X ___ student assistants) = +______

Total = +______

Faculty rank:

- ($2,116 for assistant professor) +______
- ($4,363 for associate professor) +______
- ($6,455 for professor) +______

III. **Subtract:** Number of post-MLS employers, excluding present employer:

- ($409 X ___ employers) = -______

Predicted Salary = $______
Two factors which were included in this study and not found to be significant in salary determination were publications and graduate academic degrees in addition to the MLS. While these factors individually may not significantly affect salary, they may be important to specific administrators who make promotion decisions; hence increments given for higher ranks can indirectly reflect these factors.

The study also shows that library faculty who change employers find that each move significantly lowers their salary. This finding is somewhat surprising since similar studies of other groups have shown this factor to affect earnings positively. This suggests that library faculty change jobs for reasons ranked higher in importance than to seek a higher salary. Two peculiarities of this market may help explain why this is true. First, in the labor market for library faculty, positions are often advertised and funded based on minimum qualifications. However, it is not uncommon to find a large number of applicants for each vacant position. As a result, employers often find the applicant pool to include many candidates with qualifications far exceeding the minimum requirements of the position advertised. This allows an opportunity for the employer to fill the position with a person who has a current salary, which is based on the qualifications of the individual in his or her current position, that is higher than the amount allocated for the position the individual is seeking. This means that if the individual accepts the offered position, he or she will have to accept a reduction in earnings.

A second peculiarity related to this finding can be found in the fact that the academic library labor market is dominated by females (70 percent in the sample for this study). Numerous studies have shown that females tend to have lower reservation wages than men. That is, the minimum earnings that a female will accept for a given position is generally lower than those for men. These facts help explain, based on the results of this study, the obvious willingness of library faculty to accept lower salaries when changing employers. Brenda Major and Janice J. Kirkland provide a review of the literature, with an examination and discussion of gender differences related to personal entitlement with respect to payment for work performed.32,33

A final observation concerns empirical evidence that suggests that intellectual activities are not directly rewarded with significant increases in earnings. This finding is contrary to previous studies of academic faculty disciplines and probably affects the amount of effort exerted by library faculty to contribute in this area. (As noted earlier in the paper, promotion increments can capture the impact of intellectual contributions on earnings.) Given ACRL's desire to encourage college administrators to treat academic library faculty equally to comparably ranked faculty in other disciplines, this finding suggests that the reward structure for research activities may not be in place to support the promotion provisions of the "Standards." However, whether the lack of reward for intellectual activities is peculiar to library faculty at the senior colleges of the University System of Georgia is unclear. It may be that the research activities of faculty in all disciplines at these institutions are not directly rewarded. Additional research is needed to provide further insight into this aspect.

Notes


27. Lindley, Fish, and Jackson, "Gender Differences in Salaries," 241-59.


To the Editor,

C&RL and Ronald Bukoff, author of "Censorship and the American College Library" (C&RL 56 [Sept. 1995]: 395–407), were not well served by your editorial readers. The article could and should have been much improved if its conclusions were to be given credence on such an important topic. As it is, the statement that "censorship is . . . flourishing in American college and research libraries" cannot be regarded as proven and should not be further disseminated as fact.

The statistical basis for the study is weak. The survey sample of 110 colleges (much less the actual sixty-eight respondents) is too small to be taken seriously, and the author provides no indication of what the level of expected error is, a minimum requirement. He indicates a misunderstanding of sampling work by saying in his conclusion that "one-third of the libraries surveyed" experienced censorship. Not so: one-third of his sixty-eight respondents reported censorship. The author also fails to address the high likelihood that nonrespondents will be less likely to have experienced censorship.

But what is censorship? In such an article one would hope for a working definition (did he give one in his survey instrument? we don't know). Censorship may be variously defined as official attempts at suppression or as any individual expression of a viewpoint hostile to another's world view. As it turns out, Mr. Bukoff includes all of these as well as simple vandalism in his count of censorship events, and in fact, these latter acts turn out to be his largest single category. This is not helpful if we want to analyze coldly the more dangerous encroachments of official suppression. But for this author "it is not always easy to say" what is censorship even when, in the quoted instance, he is describing a title withdrawn "because of the faculty member's strong views in opposition to the ideas found in the book." An author this unsure of his ground should be helped to refine his views.

The author laudably tried to make his study comparable with earlier studies in academic libraries. A similar effort would be valuable in carefully defining censorship, and also perhaps in using such data to compare censorship in academic libraries with that in public libraries. Our received wisdom is that there is much less in college libraries; Mr. Bukoff could do us a service next time by telling us whether or not this is true.

Let me add that I found Paula De Stefano's article on use-based selection for preservation, in the same issue (409–418), engrossing, well written, and persuasive; an excellent piece.

Peter Graham
Associate University Librarian for Technical and Networked Information Services
Rutgers University
Book Reviews


A more accurate subtitle for this book might have been “The Effect of Automation on the Rationale and Role of American Libraries.” Intended primarily for administrators in higher education but also for librarians, a dozen essays describe the present state of the academic library in the United States and the manner in which its traditional operations—selection, acquisition, organization, dissemination—and its position within higher education have been altered by the rush of automation.

The major units in the present-day library would be unrecognizable to anyone who retired even five years ago: cataloging now increasingly exports its tasks to outside contractors, selectors are as much concerned with access to invisible materials as with the purchase of print books and journals, nonlibrarians such as programmers and fundraisers have been added to the staff, and in an attempt to provide a rational support structure for academic functions, administrators are increasingly linking the library to computing and telecommunications centers as we move from the “storehouse” to the “gateway” model of providing information. Meanwhile, librarians struggle with the “bimodal” library, pressured by faculty who continue to demand print materials and by library administrators who see the future of librarianship as inexorably linked to automation and the development of access modes to information.

The authors address the issues assigned to them with assurance and conviction as they review where we have been and where we are going: the special needs of the community college (although why not an essay on the special needs of the college as opposed to university library?), the basic as well as continuing education needs of the staff, organizational and personnel issues, and the position of the academic library in the educational enterprise.

They make clear that as libraries’ mode of operations changes, so will the way librarians work. Jordan Scepanski states baldly, “... the library will serve as a warehouse of book and journal collections that for one reason or another have not been digitized and are not available in electronic form” and may become a book museum or a study hall. He believes (hopes?) that in the future, librarians will have Ph.D.s and will be fully integrated into the faculty as teachers and researchers. (Will we finally have RE·SPECT? As one of my philosophy teachers used to say, “Maybe yes, maybe no.”) Charles Newman asserts that “the position of academic library director as we know it today is quickly becoming extinct,” a fact borne out by the number of library deans and directors who have recently been appointed as heads of information units overseeing computing centers, telecommunications, and even the university press, in addition to the library.

Not much in this group of essays is new to the working academic librarian, though it is useful (and jolting) to be confronted with one’s image in the mirror. Much, if not most, of it will be new to administrators in higher education who, as Chapin and Hardesty point out, usually concern themselves with libraries primarily as a budget issue (a black hole, in their view) rather than with their inner workings or their role within the institution. Because they are so busy, how-
ever, I suspect that administrators will not take the time to read the entire book. Most useful to them will be Joanne Euster's essay, which describes the reorientation of the library from the storehouse to the gateway model, Carla Stoffle and Kathleen Weibel's essay which describes possible avenues for funding and emphasizes the need to incorporate technology into the budget rather than depend on donor support for automation; and Paul M. Gherman's and Robert C. Heterick's concluding essay, which probes the increasingly intimate relationship between the library and the campus computing service.

The book concludes with a summary review of the literature concerning the current issues in academic librarianship and a very good annotated bibliography that mirrors the chapter headings.—Eva M. Sartori, University of Nebraska-Lincoln.


This ambitious volume calls upon a cadre of international specialists, ranging from scholars to practitioners, to inform the reader about the past and future status of book publishing. Recognizing the dearth of research and analysis devoted to book publishing as both a commercial and cultural endeavor, editors Philip G. Altbach and Edith S. Hoshino have constructed a balanced and timely state-of-the-art review that is useful in not only library reference collections but also the offices of acquisitions librarians, collection development managers, area studies specialists, editors, publishers, booksellers, and savvy suppliers. Equally important, the encyclopedia may also serve as a course of study for students of publishing, the book trade, librarianship, area studies, and comparative education. Virtually all the essays are well documented, and frequently accompanied by bibliographies for further research, and the excellent index facilitates access to complex subjects. Even the appendix is a valuable research tool—a major compilation of book production statistics by region and country from the *Unesco Statistical Yearbook, 1970 to 1990*.

In his introductory essay, “Research on Publishing: Literature and Analysis,” Philip Altbach, professor of higher education at the School of Education, Boston College, and director of the Research and Information Center of the Bellagio Publishing Network, sets the philosophical and scholarly context for the encyclopedia, discussing why book publishing has received so little analytic attention and recommending ways “to expand the network of research and analysis concerning publishing and book development.” This well-tempered advocacy piece lends coherence and strength to the main body of the encyclopedia, which is organized into two parts.

The first part, “Topics in Publishing,” consists of thirty-four essays on types of publishing (e.g., college textbook, electronic, reference, university press); sociopolitical aspects of publishing (e.g., copyright, freedom of the press, publishing in the Third World); and the economics of publishing (e.g., book marketing, bookselling, international book production statistics). There is a refreshing array of “voices” among these essays, ranging from the personal conviction of Bill Henderson, founder and publisher of Pushcart Press, in “The Small Press Today and Yesterday,” to the factual eloquence of William S. Lofquist, commodity/industry specialist with the U.S. Department of Commerce, in “A Statistical Perspective on U.S. Book Publishing,” to the theoretical insights of Shigeo Minowa, dean of the School of International Business and Management of Kanazawa University, Japan, in “The Societal Context of Book Publishing.” The range of individual perspectives proffered on the future of publishing—
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in decline, in ascendance, at a standstill—gives credibility to the encyclopedia by acknowledging the varying viewpoints of industry analysts, scholars, and practitioners.

The second part of the encyclopedia considers the state of publishing from the perspective of six regions—Africa, Asia, Europe, Latin America, the Middle East, and North America—and selected countries (about thirty, including South Africa, Japan, Russia, Nigeria, and Canada). Although there is no formula for style or coverage, the reader can reliably expect the historic, demographic, and sociopolitical background of each country to be explored and relevant current statistical information about publishing to be provided. These country-based essays describe at length the cultural context that characterizes book publishing. Even the most cosmopolitan of readers will have something to learn: why some experts guard against African indigenous publishers “leapfrogging” over conventional book production methods directly to new electronic technologies; the lack of trained publishing professionals in developing countries, such as copyeditors in India; how the distribution system in Japan, which is based on consignment sales, affects book selling; the significance of “komiks,” derived from the American comic book, in the Philippines; or why Great Britain and France have displaced Mexico and Argentina as the leading countries importing books from Spain.

The shortcomings of the encyclopedia are few; however, the following are worthy of mention. Among world regions, Africa and Asia receive the most extensive consideration. Europe lacks the overview essay that other regions receive—an instance where the significance of the European Union as a publisher might have been articulated. The Middle East consists of merely three essays and only the contribution on “Israel” by Irene Sever is new. “The Arab World” and “Egypt” figure among seven reprints in the encyclopedia, three of which are from Altbach’s Publishing and Development in the Third World (1992). The contribution on the United States is largely a financial statement, devoid of philosophical or cultural context. The other regional essays are so informative that the reader longs for comprehensive geographic coverage.

Topics lacking treatment include ethnic publishing in the United States and an overview of official and intergovernmental publishing. Most subjects are sufficiently introduced within the typical double-column, six- to twelve-page, length, but others are perhaps too complex to explore within these confines. Albert Greco’s “Mergers and Acquisitions in the U.S. Book Industry, 1960-89” falls short of a satisfactory examination of economic concentration in the publishing industry; the reader expects more precise documentation for some of the tables and would be grateful if the appendix of mergers took into account the seminal work of Elin Christianson, “Mergers in the Publishing Industry, 1958-1970,” Journal of Library History (1972).

Through the range and diversity of topics and countries covered, common themes emerge—discussions about the stakeholders in international copyright debates from various regional perspectives; the importance of autonomous indigenous publishing; and the value of the book as a cultural asset weighed against its viability as a commercial product. International Book Publishing: An Encyclopaedia is greater than the sum of its parts and should stimulate further research.—Martha L. Brogan, Yale University, New Haven, Connecticut.


If the year 1876 counts as the Big Bang of United States librarianship, arguably the
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If the year 1876 counts as the Big Bang of United States librarianship, arguably the
major force unleashed by the explosion was that of information, research, and educational services to users. This auspicious year brought (in addition to the founding of ALA) publication of the Bureau of Education's Public Libraries in the United States of America chapter on “Works of Reference for Libraries” and Samuel Green's pioneering “Personal Relations Between Librarians and Readers” (Library Journal, 1876). The subsequent quarter century produced a literature that established the repertory of goals, categories, and issues for reference work as textbooks like Reference and Information Services teach us that repertory now.


The new Reference and Information Services looks back at this history and its own first edition from the vantage of another Big Bang, the explosion of the Internet, a development signaled by the expansion of a couple of pages from the old chapter 5 into a new chapter on networked information. The new edition is approximately 150 pages longer than the first and continues its bipartite division of topical chapters on "concepts" (that is, the various dimensions of reference service) and "source" chapters on types of publications. The subject index has been helpfully expanded, and coverage of children's and Canadian materials has been increased. The text has been redesigned so that sections and subsections are now better distinguished typographically, and it has been thoroughly revised. Revisions range from tinkering with paragraphing and word choice to general augmentation (chapter 1) to thorough reworking (chapter 10, former chapter 2) to updating with sources, formats, and services not available to the first edition.

In summarizing a field's knowledge, a textbook both instructs the neophyte and reminds the practitioner while acting for both as a guide to the literature. The revised Reference and Information Services, succeeds in these roles. While offering much information in highlightable, outlined form, it reports the variety of opinion on disputed questions, and lards its pages with notes and chapter bibliographies from which students might develop papers or presentations and librarians might review what they think they already know.

Students should be warned, however, that reference librarianship is more interesting than this text makes it out to be. Because of the need to summarize, textbooks often are clearly written but struggle to be interesting. With their functional, usually simple prose and their gray expanses of material arrayed in testable format, they tend to drain a topic of the blood of everyday reality; moreover, the form encourages such portentous or merely vapid generalizations as "The learner does the postulating, analyzing, and, ultimately, learning" in the present chapter on instruction. No one will contend that this book is a good read, for, although the editors have largely harmonized the discord that can creep into multi-authored works, one misses voice and color in this book's blandly utilitarian displays of information and analysis. About this highly personalized activ-
ity of reference service, about personal qualities and behaviors, the people who offer and use reference services, it has less to say than it might. Unlike its predecessors, it is reticent about the affective aspects of service, the interpersonal dynamics, pleasures, and satisfactions of the work; in general, the hard glint of clinical abstraction lingers in its gaze. Thus, no Bopp and Smith librarian would feel the "interest, amounting to fascination, [the] thrills, amounting at times to ecstasy" that Wyer sees as the librarian's occupational reward. If capable of it, the Bopp and Smith information hound would raise an ironic eyebrow at Hutchins's narrative of a young librarian who returns "flushed from the periodical indexes" to the desk, where she is flustered to encounter a student whom she and colleagues are transforming into a library-competent scholar; nor would the student, days later, feel a pang of disappointment in not finding her at her post.

Those who lament the absence of theoretically minded "dead Germans" in librarianship will find no comfort here except perhaps in the rather eccentrically cast chapter 10, which, with chapter 1, might have paid more attention to the economic and political trends that currently threaten egalitarian library service. The editors might have reconciled chapter 6 on instruction, and indeed the entire history of reference librarianship, with the statement in chapter 7 that "[reference librarians rarely see themselves as educators." An uneasy tension pervades the text's participation in the transition from print to electronic services. OCLC and RLIN are still quaintly labeled "nontraditional" reference sources; cards introduce bibliographic control and printed pages periodical indexing; the encyclopedia chapter discusses multimedia but gears search strategies to printed versions. Granted the difficulties of using electronic interfaces to demonstrate these points, might the text not be reconceived to do so?

Bopp and Smith situates its workman-like bulk squarely in the century-old United States tradition of reference service and is eminently usable in all the ways its predecessors have been. Because Katz (new edition scheduled for 1996) covers similar territory in similar ways, personal preference may ultimately determine whether a general reference course requires one or the other. Minor differences of emphasis aside, Bopp and Smith is rather more conscious of itself as a survey of the reference literature, whereas Katz, like Wyer and Hutchins, is more interestingly written. Bopp and Smith smells rather of earnestly cheerless "learning sessions" in airport Ramadas, whereas Katz smells a little more of the reference desk.—Robert Kieft, Haverford College, Haverford, Pennsylvania.


This book, which publishes the papers presented at the 1994 Clinic on Library Applications of Data Processing, focuses on fairly recent developments in the area of electronic texts. Its attempt to address the impact of these developments on both scholarly research and library services is not always successful. Although the eleven papers are appropriately wide-ranging, their quality is very uneven. Because a significant number of libraries have started to provide access to electronic texts in a serious fashion, a thorough examination of the impact of these texts on library services has recently become possible and necessary. As a result, libraries have begun to grapple with a number of issues, such as the development of selection criteria, licensing and copyright regulations, changes within the MARC format to allow for description of and access to electronic/internet resources, and fundamental decisions on
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Because a significant number of libraries have started to provide access to electronic texts in a serious fashion, a thorough examination of the impact of these texts on library services has recently become possible and necessary. As a result, libraries have begun to grapple with a number of issues, such as the development of selection criteria, licensing and copyright regulations, changes within the MARC format to allow for description of and access to electronic/internet resources, and fundamental decisions on
how electronic texts would be made available to the scholarly community. The thinking that has been done recently in this area and the various projects that have resulted from it have clearly advanced our understanding of these issues. A number of the better papers in this collection reflect this progress.

Susan Hockey offers a succinct historical overview of electronic texts in the humanities since the 1940s, emphasizing the necessity of descriptive markup that recognizes the structural components of texts and demonstrating the ways in which some of the lessons learned have been applied to digital imaging. Hockey quite rightly deplores the lack of progress in the development of analysis tools. Such tools currently constitute a vital missing link for scholars who wish to start using these texts in a rigorous and sophisticated fashion. C. M. Sperberg-McQueen discusses the text encoding initiative (TEI) that has offered a set of guidelines for encoding literary and linguistic texts using standard generalized markup language (SGML). A fascinating paper by John Price-Wilkin describes one approach that has used standards (including use of the TEI guidelines to build SGML-compliant text corpora) and open systems to create a wide-area electronic text service. This approach ensures the reusability of texts, the possibility of applying a variety of analysis tools, and the separation of data and software. Furthermore, the textual analysis systems that implement this approach at Virginia and Michigan allow for speed, phrase searching, truncation, indexing without stop words, structure recognition, and fine-level result displays (KWIC). These are requirements that many text retrieval systems cannot deliver but which are essential for the researcher.

The two other papers that report on experiences with electronic texts within libraries are severely limited by a nuts-and-bolts, "how-we-did-it" approach that is not particularly enlightening. In her paper on the information arcade at the University of Iowa Libraries, Anita Lowry does not achieve the distance from the project that would be necessary to draw valuable insights. Mark Day's too-extensive reportage on the electronic text resource service at Indiana University is a peculiar combination of a somewhat naive plunge into postmodern theoretical waters combined with personal and institutional history writing that ultimately does not advance our thinking on the topic.

Three papers introduce issues that go beyond the delivery and analysis of electronic texts. Rebecca Guenther gives a very thorough overview of some of the problems that arise when providing bibliographic control of and access to electronic texts. She offers a history of some of the important modifications to the MARC record, including the electronic location and access field (856). Guenther also touches upon the work done by the Internet Engineering Task Force (IETF) on uniform resource identification, and by the Library of Congress on the electronic cataloging in publication project. The compatibility of SGML and MARC are also explored, suggesting the possibility of some promising interactions between the two standards. The copyright issues that all Internet users are confronted with are visited by Mary Brandt Jensen in a readable and realistic fashion. She provides for the uninitiated a fine introduction to a complicated legal combat zone. Finally, a paper by Lorrie Lejeune from the University of Michigan Press argues for inclusion of publishers in their traditional role as guarantors of quality and credibility within the new electronic environment. Although this role is definitely desirable, the shift from print-based to electronic publishing is not one that centers only around secure online cost recovery. Lejeune glosses over some of the basic economic shifts that are already taking place: e.g., the replacement of a purchase transaction by a license or
royalty transaction. Such shifts have profound implications for libraries, changing the cost factors of prolonged or repeated consultations, as well as the locus of ownership of the artifact. Nor are issues of cooperative collection development or interlibrary use addressed. One would also hope, at least from a library perspective, that the cost of perpetuating the role of the publisher as guarantor of quality is not decided by asking, "How much will the consumer pay?" but rather by asking, "How much does it cost to perform the functions of high-quality peer review and editing?"

Conversely, the scholarly implications, of incorporating electronic texts in humanities research are far from clear. First of all, relatively few scholars have used electronic texts and textual analysis systems extensively in their research; and second, even for these electronically sophisticated researchers, the querying of electronic texts has only informed one particular aspect of the research. Thus, although some researchers might enter the proclaimed electronic age at certain moments, they are not full-time inhabitants. Given this state of affairs, it is perhaps too early to have valid pronouncements on this topic. At any rate, it appears that the scholars who were invited to this conference were not prepared to do so.

Jay David Bolter's keynote paper recounts the history of writing as a movement from the printed word—a stable representation governed by authorial or corporate control guaranteeing the accuracy and fixity of the text—to the electronic text, displaying qualities of fluidity, multiplicity, and dispersed control. Bolter asserts the somewhat dubious point that authorship and writing in a print environment have been creative activities, whereas in a hypertextual environment they've become merely connective. Bolter expands on this assertion by claiming that "copyright is incompatible with... electronic writing" because copy-right theory is embedded within the notion of author as creative agent.

Although his analysis is theoretically sophisticated, it really does not move the reader beyond generalities that have by now become daily journalistic fare. James Marchand's paper, which abruptly returns us to techno nitty-gritty, is an impressionistic and eclectic account of a scholar's trek through technology. Although Marchand correctly identifies certain problems, such as the lack of standardization and of consideration of user needs, these observations are clouded by generalized statements that are contradictory or overly simplistic. Robert Alun Jones advocates effective collaboration between scholars and "tool developers," which he illustrates using three instances of such cooperation at his home institution.

It would have been extremely useful to have included in this collection a number of papers by scholars who have actively used the electronic text services described by Price-Wilkin, either at Virginia or Michigan. Scholars with solid experience in this area could have explored the possibilities and limitations of these systems; the ways in which electronic texts can further current research; new areas of humanities research that now can be effectively tapped by using electronic texts; the searching capabilities and effectiveness comparing the SGML-encoded text corpora to the ARTFL database (Chicago) of French texts that does not use SGML; the usefulness and/or limitations of "minimal" structural markup and the possible need for more sophisticated but expensive higher-level markup; innovative ways of incorporating electronic texts in day-to-day teaching, their requirements of and needs for analytical tools; and the impact of these systems on humanities research methodology.

An in-depth and thorough examination of all these issues is needed. Some of the papers in Literary Texts in an Electronic Age...
are valuable starting points, but the book as a whole fails to accomplish this goal.—
*Kurt De Belder, New York University.


All the world, by some accounts, is fast becoming images. Text has long been digitized. Sound has long been digitized. Visual images themselves, which have been available as bits as long as have the others, now at last are becoming available to the general online world thanks to the World Wide Web. The end result of all this effort has been the creation of images: images of text, images of other images, multimedia applications using sound and text and graphics, and much more. If nothing else, the hours that we all spend now in front of video screens are making us very aware of images.

There is an accompanying suspicion, however, that a world preoccupied with image is a world become superficial. An image, some feel, somehow bears less validity or significance than "reality." Much criticism of the entertainment value of images stems from this suspicion. The hold of television and video games on the consumer imagination is criticized for contributing to such superficiality: entertaining images that should—but many feel do not—have something more real underneath.

The controversy that accompanies the collection of images, particularly their collection by an icon of established culture such as a library, is more understandable if it is considered in conjunction with this suspicion of images. Libraries perennially have assembled vast image collections: illustrations accompanying text inside printed books and illuminated manuscripts, images standing alone assembled into books or preserved in various other media. By the modern, digital definition, library contents—text and all—might even be seen to be nothing more, or less, than giant collections of images.

Michel Melot presents a masterful analysis of the many issues involved in this complex and convoluted picture in *Les Images dans les bibliothèques.* Melot is the former curator of the prints collection of the Bibliothèque Nationale, was the first head of the Pompidou Center’s Bibliothèque Publique d’Information, and currently is President of the Conseil Supérieur des Bibliothèques. He is an accomplished author and a recognized expert on prints and images. This book, which contains the contributions of three authors, is at once a handbook of library procedures for the treatment of images, an essay on the particular French approach which views library problems as processes rather than objects (French librarians think of documentation and collection more than they do of books and serials), and, thanks to Melot’s essays, a trenchant piece of sociological and semiological investigation into the precise meaning of the term *image.*

Melot’s introduction sketches the distinctions that others have drawn around the concepts of image, sign, language, and writing, and the differences and relationships he sees among them. His erudition on the subject is impressive: fans of semiology, structuralism, linguistics, and cognitive studies will not be disappointed, yet readers unfamiliar with or usually uninterested in these arcane areas also will have their understanding of “images” much deepened by Melot’s analysis.

The first part of the book, “Documents and Their Users,” covers image reproduction, uses and users, and “the great collections.” The second part of the book, “Managing the Fixed Image,” addresses the practical topics: collections, conservation and restoration, reproductions, documentation, communication and services. The book’s third part concerns the particular problems of motion pictures:
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their collection, handling, documentation, and communication.

Each of the book’s three central sections emphasizes history and includes many lists of resources and statistics, both French and foreign. The introductions provided to the at-best Byzantine realm of French legal regulation of images and their description, and of subjects such as copyright and the dépôt légal, will be much appreciated by both French and foreign initiates to these areas. I myself was particularly interested by the book’s third section, with its reproduction of the documents now actually in use to describe and organize the fast-growing library world of moving images.

Busy librarians seeking useful applications of the general case will find in the later sections numerous “practical” examples to consider, just as specialists enmeshed in their particular portion of detail in the later sections may find relief in an excursion into Melot’s prose.

Melot’s elegant conclusion succinctly and pungently summarizes both the fears and the possibilities attending the general subject: “l’image est paresseuse,” “l’image est trompeuse,” “l’image est dangereuse”; (the image is lazy, deceptive, and dangerous). Melot might be describing a lover—which perhaps he is, for him and for his readers. “For many,” says Melot, “the image is still a place of passion—opposed to writing, which is considered a place of reason.” The question of the inclusion of images in libraries is purely “academic.” He asserts, “The image inhabits the book and therefore the library” but “The image has been dogged by a moral discourse which has denounced its failings, without proving them . . . one might as well, with Plato, condemn all poetry and art.”

Melot turns the tables, ultimately, on both the critics and some defenders of the image by asking, “The image, universal language?” He goes on to say, “The internationalization of economic, scientific and cultural commerce without doubt is at the source of the inflation of images. The important thing is to teach everyone to use them. It is here that one finds the mediator role of the librarian . . . far from being a free and universal language, the image never is free of all code . . . better to continue neither to confound images with reality, nor to present them as truths somehow fallen from the sky.”

The book is intriguing and challenging. It is a necessity for anyone wishing to understand the place of images in libraries in France today, and it is at least of great interest to anyone anywhere who is interested in images at all. It would be helped by an index, and particularly, by a glossary of its many technical art, photography, and imaging terms.

The authors have supplied plentiful citations and references for further research. I do wish, though, as I do nearly always now, that more online sources might have been cited. So much in imaging now is taking place online: being proposed, argued, defended, and actually implemented. So many of the commentators on such subjects—in France as well as elsewhere—personally and professionally conduct so much of their business on the Internet or the Minitel now that it really has become incumbent upon the authors of a printed work to include some references to online digitized resources on their subject. But perhaps this must await the book’s online version. For now, in print and on paper, and with images or as images, the book is a fascinating and highly recommended resource.—Jack Kessler, kessler@well.sf.ca.us.
Manuscript Preparation

Manuscripts of articles should be sent to the editor-designate, Donald E. Riggs, The University of Michigan, 818 Hatcher Library South, Ann Arbor, MI 48109; (313) 764-9356; fax: (313) 763-5080; or e-mail: driggs@umich.edu.

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7. The author is responsible for verifying all citations carefully. Bibliographic references should be consecutively numbered throughout the manuscript. Double-spaced endnotes should appear on separate pages at the end of the article. Use regular aligned numbers (1., 2., etc.) not superscripts.

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College & Research Libraries
Compiled by Kathy (Kit) Dusky
Edited by Eldon Tamblyn
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FILING
Filing is word-by-word (ALA, 1968).

ABBREVIATIONS
Standard abbreviations are used except in titles. Names of some organizations—ALA, ACRL, LC, etc.—are also abbreviated and are alphabetized as if spelled out.

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