

# Planning Serials Cancellations and Cooperative Collection Development in the Health Sciences: Methodology and Background Information\*

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## ABSTRACT

In an era of steady-state budgets many research and academic libraries must cancel a significant number of current serials to maintain acquisitions of monographs. This paper reviews several techniques that have been used or that are of potential use in a rational selection of titles for cancellation. The context of the proposed methodology involves a network of libraries rather than an individual library. The methodology was tested with specific health sciences serial titles held by University of California libraries and resource libraries in NLM Region XI.

As a test for the proposed methodology, background data were collected on 600 current foreign language serial titles included in SERLINE and held by at least one of the libraries in the networks of interest. Price, major secondary service coverage with productivity/impact factors, extent of holdings, and average number of recorded circulations per year in several of the libraries were recorded for each title. With the use of several different decision rules, estimates were made of the subscription savings that might be realized. It seems feasible to extend the same methodology to other groups of serial titles.

**SERIALS** subscriptions are a significant and important part of the budget of any major library; serials easily comprise 50-70% of the acquisition budgets of most academic libraries. Some special libraries spend even larger percentages for serials. At the University of Califor-

\* An expanded feasibility study based on the earlier work of Dorothy Gregor [1]. Begun as an individual study project in the School of Librarianship, University of California, Berkeley, this project was continued with support from the Institute of Library Research and the University of California University-Wide Library Automation Project.

nia, Berkeley, for example, the Chemistry, Biology, and Public Health Libraries in fiscal year 1973/74 liened 96, 93, and 86% of their total acquisition budgets for serials. With inflation, dollar devaluation, and the rapidly increasing serials price index, many libraries have been faced with the task of cancelling serial subscriptions, sometimes on a rather hurried and hurried basis.

It is difficult to make these cancellation decisions on any rational or coordinated basis when there are a large number of titles to consider, or when the cuts must be made with very little time available for planning.

During the last few years it has become more and more apparent that we are facing a crisis in regard to the conditions which exist in the publication of medical and biological literature. . . . The tremendous number of journals being published and the continued increase in the cost of yearly subscriptions have made it increasingly difficult for libraries to maintain adequate subscription lists. At the same time libraries have been facing a marked decrease in budgets, gifts and other forms of financial support [2].

This description of our current problem was published in 1935. The operational problem of planning for large cutbacks in serial subscriptions was of interest to us and prompted this pilot study.

Many techniques are available to help in decision making regarding selection or cancellation of serials, and some of the more obvious methods are described in a later section of this paper. Each library can make its own decisions on a title-by-title basis, considering only the needs or objectives of its institution. However,

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in order to ensure access to local users within a reasonable time period, it would be preferable to make decisions from a system or network point of view, considering the holdings and needs of other institutions. For example, it would be regrettable for a University of California (UC) library to cancel an important title to solve its local budgetary problem, if that title were unique in the entire nine-campus system. For this reason, our study tried to provide data that would facilitate decision making in a larger networking context. We were particularly interested in several overlapping systems or networks: the UC library system, the UC/CSUC intersegmental system (nine UC campuses and nineteen campuses of the California State University and Colleges), and resource libraries within NLM Region XI (Arizona, California, Hawaii, and Nevada).

### OBJECTIVES

The major objectives of this study were to:

1. develop a methodology for obtaining and providing background information that would be immediately useful for planning and decision making regarding cancellations or the cooperative acquisition of serials;
2. determine the utility and feasibility of this approach;
3. provide planning information that would be of immediate use to library selection personnel and to management.

### METHOD OF APPROACH

#### SELECTION OF SERIAL TITLES

It was not practical to begin our study with the tens of thousands of current UC serial title subscriptions. We needed some way to select a smaller and more workable group of titles. Several methods of partitioning were considered, including:

- subject categories by LC classification number,
- subscriptions of a particular branch or campus library,
- titles covered by a designated abstracting or indexing service or by a *Current Contents*<sup>®</sup> publication,
- titles published in particular countries or in particular languages.

From several earlier studies we knew that

foreign language publications generally receive less use than English language publications, and it is obviously desirable to concentrate initial cancellation/cooperation efforts on low-use titles. It is also obvious that sharing collections is more feasible for groups of libraries that already have some system-wide connections and commitments. Because SERLINE, the National Library of Medicine's on-line serials file, includes the capability of searching by language of publication, we could easily identify and print out the potential low use foreign language titles currently held in Region XI. Six of the nine UC campuses have health science libraries. These libraries are Region XI resource libraries and report their holdings to SERLINE, so we could check multiple subscriptions for both the UC system and the network represented by Region XI resource libraries.

When this study began, SERLINE contained approximately 5,600 current biomedical serial titles. Originally generated from the current titles included in the *Union List of Medical Periodicals* from the Medical Library Center of New York, SERLINE also includes all titles indexed for *Index Medicus* and selected titles indexed in *Biological Abstracts*, *Chemical Abstracts*, *Excerpta Medica*, *Psychological Abstracts*, and the *World List of Medical Periodicals*. Current additions include all new *Index Medicus* titles and titles cataloged by the National Library of Medicine which meet the criteria of being primary, substantive, and pertinent to biomedicine [3].

We further restricted our attention by excluding titles published in the western European languages of French, German, Italian, and Spanish. Including the western European language titles would have added another 2,354 titles (757 in French, 806 in German, 365 in Italian, and 426 in Spanish) to our list and would have greatly increased the burden of checking. Focusing on the remaining foreign language titles provided us with a list of manageable size and with a high percentage of low-use titles. The resultant list included 950 current titles in thirty-four languages. NLM furnished us with computer printouts of the 950 titles arranged by language with supporting bibliographic information and locator codes for the Region XI libraries that had current subscriptions. These 950 titles served as our starting point for data collection.

## INFORMATION TO ASSIST TITLE EVALUATIONS

Many factors could be considered in evaluating serial subscriptions on a title-by-title basis, including the following:

- cost of the subscription,
- number of subscriptions available elsewhere (within the same institution and in cooperating institutions), and the extent and completeness of retrospective holdings for each title,
- extent of coverage by abstracting and indexing services,
- frequency of citation to a title from other publications,
- extent of use made of the material (e.g., recorded circulation),
- frequency of check-in and claiming operations (and associated record-keeping costs),
- costs of storage (e.g., shelf space, binding),
- availability in microform,
- relevance to present or future academic programs or institutional objectives,
- ranking or evaluation by library constituencies.

Although we used only the first five of these factors in our study, all of the factors are described below.

*Subscription Costs.* To assist in the subscription review process, some libraries periodically prepare a list of current subscriptions sorted in rank order by subscription cost. This is relatively easy to do with computer based serials systems, and highlights the most expensive publications for immediate attention. This approach also illustrates that a relatively small percentage of titles may account for a large fraction of the serials budget. A recent study in the UC Berkeley Biology Library, for example, showed that half of the total serials budget was spent on 5% of the titles (194 high cost titles); half of the titles were received as gifts or exchanges.

*Subscriptions Available Elsewhere.* One obvious situation in which cancellations should be considered occurs when an institution holds more than one subscription to the same title. Some cuts can often be made here without seriously damaging local access. However, it should also be recognized that the cancellation of duplicate copies of a heavily-used title can create more user distress than the cancellation of another low use, albeit unique, title. If the goal of a library is to maximize user access, then

maintaining duplicates of high-use titles and relying on interlibrary borrowing for titles used only occasionally or rarely will better serve that goal.

For those titles not duplicated in the same institution, consideration can then be given to the extent to which issues of a title might be readily available for use in some other institution. This is easiest to do when there are reciprocal use agreements that work well between institutions (e.g., different branches of the same campus library system, different campuses of the same university, different members of the same library network). To make cancellation decisions on a regional or system-wide basis requires an understanding of the holdings of each of the cooperating libraries on a title-by-title basis.

When reviewing the holdings of cooperating libraries, consideration should also be given to the extent of each library's retrospective holdings of each title. A library with only recent or broken holdings of a given title might prefer to cancel its subscription with the understanding that one of the other libraries with more complete holdings would continue to subscribe to that title. Cooperating libraries might also want to consolidate backfiles of titles selected for a shared-serials program. To facilitate interlibrary lending and to free storage space in the libraries no longer maintaining a title, backfiles can either be sent to the library responsible for the current subscription or be sold. Thus, holdings information is extremely helpful in discussions of cooperative sharing of responsibilities for serial subscriptions.

*Extent of Coverage by Abstracting and Indexing Services.* Some useful information can usually be obtained by examining the treatment given to each title by the abstracting and indexing services. The fact that a title is not covered by one or more of the secondary services that are central to its subject field could reflect the fact that the service is unaware of the title, but it is more likely to reflect a value judgment by the reviewers or selection staffs of the secondary services. In the latter case, non-coverage of a title probably means that the publication is of marginal value in the opinion of the secondary service. If a title is covered by secondary services, it is of interest to know how many services and which ones (i.e., how many "endorsements" exist for the title).

Further refinements in the analysis of second-

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ary coverage can be obtained by examining the number of articles covered each year from each journal by each of the secondary services. A title that contributed sixty articles a year to a given secondary service would seem to be generally more productive and more significant than another title in the same field that contributed only one article per year to the same secondary service. Thus the "yield" of each serial title, as a reflection of the judgments made by the reviewers for the secondary services, would seem to be a useful indicator of the contribution made by a particular title to a subject field.

*Frequency of Citation.* Authors make their own value judgments in selecting articles as references in footnotes or bibliographies in their own publications. Thus the composite of all bibliographic citations accompanying a collection of published scientific papers (e.g., an issue of an annual review series) represents the group judgment of scientists as to which publications are most significant. An analysis of the citation frequency of individual serial titles can thus provide another independent measure of the significance or value of individual titles, with a large body of authors serving as judges. Several studies have been made of citation frequencies and subsequent rankings of titles in general subject areas. A few examples of such studies in the health sciences field are noted in Table 1. The examples show that there are several types of sources that can be used to obtain the citations to be analyzed.

Another related form of value judgment is represented by class reading lists that are compiled in academic institutions in selected subject areas. These lists also reflect value judgments (perhaps biased by a knowledge of what publications are actually available locally for use by the students) regarding the serial literature. An example of a list of serials compiled by this approach is given in a report of an analysis of reading lists for general psychiatric residents from 140 three-year approved training programs [16].

Still another variation on this theme is the merging of many "basic" or "core" lists from different sources into a summary composite list [17].

All of the citation studies mentioned above focused on particular subject fields or the interests of very specific user populations. A broader view can be obtained by reviewing the citation frequencies from the *Science Citation Index*<sup>®</sup>

(*SCI*) or the *Social Sciences Citation Index*<sup>®</sup>; both of these indexes are published by the Institute for Scientific Information (ISI). ISI claims to screen most of the significant scientific serial literature for the *Science Citation Index*, transcribing approximately 370,000 article citations per year from about 2,400 source serials, and showing the relationship between each article and other references that are included in the source citations. Thus a computer file is prepared on a continuing basis which includes an estimated 90% of the world's significant scientific and technical literature. This source file can provide many useful statistics, such as frequency counts to show the number of times a given serial title was cited during a given year by articles in the 2,400 source journals. Some data for the 152 most frequently cited titles (accounting for 50% of all references

TABLE 1  
EXAMPLES OF PRIOR CITATION STUDIES IN HEALTH SCIENCES TO IDENTIFY SIGNIFICANT SERIAL TITLES

| Subject field        | Date of report | Source of sample citations                | Reference |
|----------------------|----------------|---|-----------|
| Public health        | 1974           | Master and doctoral dissertations         | 4         |
| Biochemistry         | 1973           | <i>Annual Review of Biochemistry</i>      | 5         |
| Biomedicine          | 1973           | <i>Index Medicus</i>                      | 6         |
| Psychiatry           | 1968           | Reading lists                             | 7         |
| Biomedicine          | 1966           | <i>Current List of Medical Literature</i> | 8         |
| Biochemistry         | 1938           | <i>Annual Review of Biochemistry</i>      | 9         |
| Medicine             | 1937           | Primary and secondary journals            | 10        |
| Dentistry            | 1936           | Primary periodicals                       | 11        |
| Endocrinology        | 1935           | Primary and secondary journals            | 12        |
| Endocrinology of sex | 1934           | One major book                            | 13        |
| Child guidance       | 1932           | Secondary journals                        | 14        |
| Chemistry            | 1927           | Primary journals                          | 15        |

to journals) have been reported by Garfield [18-19].

Additional data are available in ISI's *Journal Citation Reports*<sup>TM</sup> (*JCR*), which provides the ranking and citation frequency for the 1,000 most frequently cited journals in science and technology. The ISI publications also provide data on the "impact factor," which is defined for *JCR* as a normalized statement of the annual citation frequency in relation to the number of articles published annually by that title. Thus a journal that published twenty articles in a given year and was cited twenty times in the literature would be considered to have a greater impact than a journal that published sixty articles in the same year and was also cited twenty times. Citation data and the impact factor are discussed in more detail in a recent article by Garfield [20]. An impact factor (ratio of serial articles published to serial articles cited) was suggested by Raisig in 1962; later he used the impact factor with data for 985 biomedical titles to provide a general measure of the value of these serials [8]. This general approach was also followed in a later study of geophysical serials [21].

*Extent of Recorded Library Use.* From the individual library's point of view, the use made of a particular title by the library's clientele is one of the more significant indicators of the value of that title to that particular library. This is a very local measurement; a given title at one library might have no use, whereas the same title at another library with a different user population might be used extensively. If such inequities of use do exist among institutions planning cooperative serial programs, it may be easier to decide which library should assume the responsibility for maintaining the title.

Use might be described in terms of recorded use (as measured by circulation statistics, photocopy requests, and interlibrary loan records) or unrecorded use in which no formal records are kept on a title-by-title basis (e.g., indications of use or non-use such as dust on the tops of the volumes, titles left out on open stack reading tables for reshelving, signs of physical handling and use of individual issues and bound volumes) [22]. Most studies in this area have involved an analysis of recorded circulation or other use data. Examples of prior studies are noted in Table 2.

Employing recorded library use as a measure may not result in dramatic savings in subscription costs, but it might help with processing costs. Recent data from the UC Berkeley Biology Library show that, in general, their high cost journals have high use; low cost or free journals have much less use. Of 845 current titles that had no recorded use during a 1974 test period, 651 were free. Cancelling all of these titles would have saved only about \$4,500 in subscription costs in a single year. However, even small subscription savings add up over a period of several years, and savings in processing costs would be more significant. As serials librarians and serials catalogers well know, it is the "free" publications—documents, foreign research institute reports, etc.—which pose the most problems for checking in, claiming, and cataloging.

Another approach that could be taken, particularly for title evaluation within a single library, is to try to save the most subscription money with the least disruption in service. Start the cancellation list with the title that has the highest subscription cost per recorded circulation, and continue listing the titles in order by this factor. At the top of the list and the first

TABLE 2  
EXAMPLES OF PRIOR STUDIES OF RECORDED SERIALS USE TO IDENTIFY SIGNIFICANT SERIAL TITLES

| Subject field   | Date of report | Library   | Records used              | Reference |
|-----------------|----------------|---|---------------------------|-----------|
| Physics         | 1974           | MIT Science Library                               | Loan records              | 23        |
| Physics         | 1972           | MIT Science Library                               | Reshelving statistics     | 24        |
| Health sciences | 1964           | Columbia Medical Library and Yale Medical Library | Charge slips              | 25        |
| Health sciences | 1962           | National Library of Medicine                      | Interlibrary loan records | 26        |
| Biomedicine     | 1962           | Yale Medical Library                              | Circulation records       | 27        |
| Biomedicine     | 1937           | University of Chicago Biomedical Libraries        | Circulation records       | 28        |

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candidate for cancellation would be the most expensive serial that had no recorded circulation; at the end of the list would be the free title that had the highest number of recorded uses.

*Frequency of Publication.* Labor and other processing costs associated with checking in each issue of a periodical, maintaining serial records, and preparing claim letters for publishers, is significant—perhaps an average all-inclusive cost on the order of 25 cents per check-in transaction. For titles published frequently (e.g., weekly, monthly) this is a significant cost factor in addition to the subscription cost. Because of this processing cost, consideration might be given (when all other factors are equal) to cancelling the serials published more frequently before cancelling those published less frequently. The measure that might be used is the number of pieces per year checked in for each title. For serials published in foreign languages, processing costs should take into account the difficulties library personnel may encounter dealing with unfamiliar languages.

*Storage and Binding Costs.* For libraries with space problems the shelf space taken each year for each title might be a major factor in deciding whether to continue a given subscription. Measures that might be considered are the annual per title figures for estimated required number of additional shelf-feet and for number of uses (e.g., circulation counts) per shelf-foot. Cancellation decisions could be made in terms of total allowable shelf space consumption for the coming year.

The binding operation may be another cost to be considered on a title-by-title basis in addition to subscription costs. The cancellation of some titles will also result in binding cost savings.

*Availability in Microform.* If a title is available in microform, a library might decide to cancel the title now and fill in missing issues later with a microform edition if funds become available. However, if serials available only in hard copy go out of print, purchase at a later date may be either impossible or prohibitively expensive.

*Relevance to Institutional Objectives.* Few, if any, libraries have a mission of collecting everything that is published. Most libraries operate with some guidelines, stated or implied, such as "collect material that is relevant to this company's business," or "acquire material that supports our present and planned academic pro-

grams." As institutional objectives and academic plans change, so should the institution's library collection policy change. Thus for many academic libraries serials subscriptions should be subject to ongoing review in terms of current academic and research objectives.

*Library Patron Voting.* One very direct way to obtain title evaluations is to ask library patrons to judge or otherwise vote on serials on a title-by-title basis. As with circulation statistics, the results of this evaluation process are very sensitive to the local situation. A simplified version of this approach is often taken by libraries when they ask department chairmen or representatives to absorb subscription costs for publications that are of unique or particular interest to those departments.

One major effort to get patron votes is presently underway at the UC Riverside Library, which has submitted a list of over 12,000 current title subscriptions to their faculty for voting on a title-by-title basis. Each faculty member has been asked to rank titles on a scale of one to five. Active titles were sorted according to academic program areas and listed in call number sequence; appropriate sections were given to each of fifty-four centers. This approach can be expensive, require a relatively long study time, and necessitate a considerable data reduction effort. Over 20,000 votes were tabulated for this Riverside study to obtain a listing in rank order of 1,800 titles which were candidates for cancellation. This list was circulated to academic departments for further review, and a final list of about 800 cancellations was prepared.

Another variation of the voting approach is to have subject specialists (who are not necessarily library users) review a source list and give some kind of rating for each title. This has been done to help obtain consensus agreements on what constitutes a core list for a particular subject field or type of library [29]. However, this approach is unwieldy for an academic or special library with several thousand titles to rate.

### DATA COLLECTION

*Subscription Costs.* For expediency, we gathered subscription cost data for this study, when available, from several published directories (including the 1973 *Ulrich's International Periodical Directory* and the 1974 *F. W. Faxon Librarian's Guide to Periodicals*), even though

prices had increased for many of the titles. The serial payment record of the UC Berkeley Library was also used as a source of price information. It was not possible to determine a subscription price for some titles during the course of the study. All prices are stated in U.S. dollars.

*Subscriptions Available Elsewhere.* Although the SERLINE data base provides location information for Region XI resource libraries, it does not include holdings data. Serial holdings for the UC system were obtained from the most recent editing copy of the UC *Union List of Serials*, as well as the latest serials lists of individual campus libraries. Holdings information for the nineteen California State University and Colleges libraries was obtained from the CSUC *Union List of Periodicals*. We obtained holdings information for other NLM Region XI libraries from the serials lists of individual libraries.

*Extent of Coverage by Abstracting and Indexing Services.*

*Index Medicus.* The NLM SERLINE data base includes health sciences serial titles from the sources described earlier. Each of the serial title records is annotated to show whether or not a title is covered by *Index Medicus*. However, no information was available regarding the ranking or yield of each title for *Index Medicus*.

*Excerpta Medica.* SERLINE records are also annotated to indicate coverage by *Excerpta Medica (EM)*. In addition, the Editor of *Excerpta Medica* generously furnished us with a list of the titles covered by that service, with handwritten annotations to identify those titles considered to be their core publications.

*Chemical Abstracts.* A 1965 publication by Chemical Abstracts Service (CAS) provided a list of the 1,000 most productive journals for *Chemical Abstracts (CA)*. This publication, arranged in rank order, lists the 1,000 top journals according to the total number of abstracts included in volumes 56-61 inclusive (1962-64) [30].

The 1970 issue of the *CAS Source Index*, the published list of periodicals covered by CAS, includes a list of the 1,000 most productive serials in terms of citations contributed to CA [31]. Compiled on the basis of citation frequency counts for volumes 68-72 (January 1968-June 1970), this list gives titles and their

rank number; however, no citation frequency counts are provided.

Chemie Information und Dokumentation, Berlin, has published a frequency distribution list of the serial titles covered by CA. This compilation covers the 5,341 journals abstracted by CA in volume 48 (January-June 1973). The productivity and scope of each journal are shown by the analysis of the number of abstracts published in each CA section [32].

Yield data for specific titles can also be obtained by performing on-line retrospective searches on each title for given date spans on the commercially available search systems offered by companies such as Lockheed or Systems Development Corporation. These systems both have CA citations from 1970 to the present.

The source data that we eventually used for this study was a frequency count provided us by special arrangement with CAS; the data included frequency counts and rank numbers for each of the 8,005 titles that contributed one or more citations to CA volumes 78-79 during the year 1973. We took both the rank order numbers and yield figures from this source.

*Biological Abstracts.* BioSciences Information Service (BIOSIS) included 7,980 serial titles in their 1973 *List of Serials*. Yield data were initially available to us in a special listing provided by BIOSIS to identify the 784 titles that contributed at least thirty citations per year to *Biological Abstracts (BA)* for each of the publication years 1969-71.

An additional listing, made available to us by special arrangement with BIOSIS, included frequency counts for each of the titles that contributed one or more citations to BA during 1973. We took frequency counts from this latter source for our study.

*Frequency of Citation.* Journal rankings were published by Garfield for the 152 most frequently cited journals (accounting for 50% of all references to journals) in ISI source publications during the last quarter of 1969 [33]. ISI's *Journal Citation Reports*<sup>TM</sup> (*JCR*), also based on ISI source publications for the last quarter of 1969, included a rank order listing and citation frequency data for the 1,000 most frequently cited titles [34]. This report series also provided impact factors for each title that took into account the number of articles published annually by each title. The rank number, number of

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citations, and impact factor from this *JCR* series were all used in our study.

A more recent series of *JCR* reports, based on 1972 citation data, has been announced by ISI but was not available for our use at the time of this study.

*Extent of Recorded Library Use.* Several of the libraries that were readily accessible to the authors had circulation records that were analyzed for this project. The UC health sciences libraries at Berkeley, San Francisco, and Los Angeles, and the Stanford University Lane Medical Library all had charge-out slips attached to the physical volumes of many of the titles that were studied. For each of these libraries, the total number of recorded circulations for a given title was divided by the total

number of years of that library's bound holdings in order to obtain an average number of circulations per year.

FINDINGS

CANDIDATES FOR CANCELLATION

The results of our data collection efforts were presented in tabular format [35]. Decisions regarding title cancellations are best made by library staff members working with their constituencies, and the authors did not label individual titles as targets for cancellation. However, we have formulated some decision rules which might be used to identify cancellation prospects. Some of these decision rules make use of the data in Table 3, which indicates the

TABLE 3  
DISTRIBUTION OF FREQUENCY OF RECORDED CIRCULATION OF SAMPLED SERIAL TITLES

| Average number of circulations per year | Number of titles with this frequency | Cumulative percent of titles with this frequency | Average number of circulations per year | Number of titles with this frequency | Cumulative percent of titles with this frequency |
|---|--------------------------------------|--|---|--------------------------------------|--|
| 0                                       | 68                                   | 18.7   | 3.0                                     | 2                                    | 90.1   |
| 0.1                                     | 36                                   | 28.6   | 3.1                                     | 1                                    | 90.4   |
| 0.2                                     | 24                                   | 35.1   | 3.3                                     | 4                                    | 91.5   |
| 0.3                                     | 25                                   | 42.0   | 3.4                                     | 1                                    | 91.8   |
| 0.4                                     | 12                                   | 45.3   | 3.6                                     | 1                                    | 92.0   |
| 0.5                                     | 16                                   | 49.7   | 3.7                                     | 4                                    | 93.1   |
| 0.6                                     | 18                                   | 54.7   | 3.8                                     | 1                                    | 93.4   |
| 0.7                                     | 13                                   | 58.2   | 4.0                                     | 1                                    | 93.7   |
| 0.8                                     | 12                                   | 61.5   | 4.1                                     | 1                                    | 94.0   |
| 0.9                                     | 9                                    | 64.0   | 4.2                                     | 1                                    | 94.2   |
| 1.0                                     | 12                                   | 67.3   | 4.3                                     | 3                                    | 95.0   |
| 1.1                                     | 10                                   | 70.0   | 4.4                                     | 1                                    | 95.3   |
| 1.2                                     | 7                                    | 72.0   | 4.5                                     | 2                                    | 95.9   |
| 1.3                                     | 2                                    | 72.6   | 4.7                                     | 1                                    | 96.1   |
| 1.4                                     | 6                                    | 74.2   | 4.8                                     | 1                                    | 96.4   |
| 1.5                                     | 6                                    | 75.8   | 4.9                                     | 1                                    | 96.7   |
| 1.6                                     | 6                                    | 77.5   | 5.2                                     | 1                                    | 97.0   |
| 1.7                                     | 3                                    | 78.3   | 5.5                                     | 2                                    | 97.5   |
| 1.8                                     | 7                                    | 80.2   | 5.9                                     | 2                                    | 98.1   |
| 1.9                                     | 6                                    | 81.9   | 7.0                                     | 1                                    | 98.3   |
| 2.0                                     | 6                                    | 83.5   | 7.3                                     | 1                                    | 98.6   |
| 2.1                                     | 4                                    | 84.6   | 7.7                                     | 1                                    | 98.9   |
| 2.2                                     | 2                                    | 85.2   | 7.8                                     | 1                                    | 99.2   |
| 2.3                                     | 1                                    | 85.4   | 8.7                                     | 1                                    | 99.4   |
| 2.4                                     | 4                                    | 86.6   | 10.2                                    | 1                                    | 99.7   |
| 2.5                                     | 2                                    | 87.1   | 10.7                                    | 1                                    | 100.0  |
| 2.6                                     | 3                                    | 87.9   |   |                                      |  |
| 2.7                                     | 2                                    | 88.4   |   | 364                                  |  |
| 2.9                                     | 4                                    | 89.6   |   |                                      |  |



TABLE 4  
RESULTS OF APPLYING SAMPLE DECISION RULES

| Language      | Number of titles  |          |                    |     |        | Cuts that could be made for each decision rule |        |          |        |          | Multiple subscriptions with missing prices* |          |    |         |    |
|---------------|-------------------|----------|--------------------|-----|--------|--|--------|----------|--------|----------|---|----------|----|---------|----|
|               | Total in SER-LINE | Not held | Dropped from study | Net | Rule 1 |  | Rule 2 |          | Rule 3 |          |   | Rule 4   |    | Rule 5  |    |
|               |                   |          |                    |     | No.    | \$   | No.    | \$       | No.    | \$       |   | No.      | \$ | No.     | \$ |
| Afrikaans     | 13                | 4        | 2                  | 7   | 1      | 21.00  | 1      | 21.00    | 3      | 46.50    | 4   | 61.26    | 0  | 0       | 3  |
| Albanian      | 1                 | 0        | 0                  | 1   | 0      |  | 0      |          | 0      | 0        | 0   |          | 1  | 0       | 1  |
| Arabic        | 9                 | 3        | 0                  | 6   | 3      | 30.00  | 5      | 45.00    | 5      | 49.00    | 9   | 79.00    | 0  | 0       | 0  |
| Bulgarian     | 26                | 13       | 0                  | 13  | 0      |  | 0      |          | 0      |          | 0   |          | 1  | ?       | 5  |
| Catalan       | 1                 | 1        | 0                  | 0   | 0      |  |        |          |        |          |   |          |    |         |    |
| Chinese       | 8                 | 1        | 0                  | 7   | 1      | 9.68   | 1      | 9.68     | 2      | 19.36    | 2   | 19.36    | 3  | ?       | 5  |
| Czecho-Slovak | 52                | 12       | 2                  | 38  | 7      | 156.40   | 8      | 171.40   | 20     | 455.90   | 22  | 485.90   | 0  | 0       | 25 |
| Danish        | 24                | 6        | 7                  | 11  | 5      | 58.44  | 6      | 116.94   | 7      | 88.80    | 9   | 205.80   | 3  | 21.00+? | 1  |
| Dutch         | 43                | 16       | 2                  | 25  | 8      | 231.94   | 11     | 312.19   | 16     | 418.78   | 21  | 547.28   | 0  | 0       | 6  |
| Finnish       | 12                | 6        | 1                  | 5   | 0      |  | 0      |          | 0      |          | 0   |          | 0  | 0       | 1  |
| Flemish       | 10                | 2        | 0                  | 8   | 4      | 67.20  | 4      | 67.20    | 6      | 100.80   | 6   | 100.80   | 0  | 0       | 2  |
| Gaelic        | 1                 | 0        | 0                  | 1   | 0      |  | 0      |          | 0      |          | 0   |          | 0  | 0       | 0  |
| Greek         | 22                | 18       | 0                  | 4   | 0      |  | 0      |          | 0      |          | 0   |          | 1  | ?       | 0  |
| Hebrew        | 5                 | 2        | 0                  | 3   | 0      |  | 0      |          | 2      | 22.00    | 2   | 22.00    | 2  | 4.00    | 0  |
| Hindi         | 1                 | 1        | 0                  | 0   | 0      |  | 0      |          | 0      |          | 0   |          | 0  | 0       | 0  |
| Hungarian     | 27                | 10       | 0                  | 17  | 8      | 217.50   | 14     | 375.90   | 13     | 307.20   | 20  | 492.00   | 1  | ?       | 1  |
| Icelandic     | 1                 | 1        | 0                  | 0   | 0      |  | 0      |          | 0      |          | 0   |          | 0  | 0       | 0  |
| Indo-Chinese  | 1                 | 1        | 0                  | 0   | 0      |  | 0      |          | 0      |          | 0   |          | 0  | 0       | 0  |
| Japanese      | 196               | 81       | 3                  | 112 | 50     | 1,264.31                                       | 52     | 1,388.81 | 87     | 2,110.52 | 93  | 2,307.27 | 6  | 35.00+  | 34 |
| Korean        | 1                 | 0        | 0                  | 1   | 0      |  | 0      |          | 0      |          | 0   |          | 0  | 0       | 1  |
| Latin         | 3                 | 2        | 0                  | 1   | 0      |  | 0      |          | 0      |          | 0   |          | 0  | 0       | 0  |
| Lettish       | 1                 | 0        | 0                  | 1   | 0      |  | 0      |          | 0      |          | 0   |          | 0  | 0       | 0  |
| Norwegian     | 4                 | 2        | 0                  | 2   | 0      |  | 0      |          | 0      |          | 0   |          | 0  | 0       | 0  |
| Polish        | 64                | 11       | 1                  | 52  | 34     | 674.20   | 36     | 778.20   | 57     | 1,040.40 | 60  | 1,196.40 | 1  | 0       | 14 |
| Portuguese    | 135               | 69       | 0                  | 66  | 10     | 96.50  | 17     | 196.50   | 24     | 255.40   | 33  | 385.40   | 11 | 60.00+  | 30 |

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|                |     |     |    |     |     |          |     |          |     |          |     |           |    |         |     |
|----------------|-----|-----|----|-----|-----|----------|-----|----------|-----|----------|-----|-----------|----|---------|-----|
| Roumanian      | 30  | 9   | 2  | 19  | 5   | 42.67    | 5   | 42.67    | 10  | 85.34    | 10  | 85.34     | 0  | ?       | 20  |
| Russian        | 166 | 31  | 6  | 129 | 90  | 1,715.20 | 132 | 2,953.68 | 148 | 2,596.60 | 210 | 4,443.64  | 10 | ?       | 4   |
| Serbo-Croatian | 44  | 24  | 0  | 20  | 4   | 50.05    | 4   | 50.05    | 9   | 97.75    | 9   | 97.75     | 0  |         | 1   |
| Slavic         | 1   | 0   | 0  | 1   | 0   | 0        | 0   | 0        | 0   | 0        | 0   | 0         | 0  |         | 1   |
| Swedish        | 22  | 12  | 3  | 7   | 5   | 247.00   | 5   | 247.00   | 8   | 335.00   | 8   | 335.00    | 1  | 5.00    | 0   |
| Thai           | 2   | 0   | 0  | 2   | 0   | 0        | 0   | 0        | 1   | 5.10     | 1   | 5.10      | 0  |         | 1   |
| Turkish        | 17  | 12  | 0  | 5   | 0   | 0        | 0   | 0        | 0   | 0        | 0   | 0         | 1  | ?       | 0   |
| Ukranian       | 6   | 0   | 0  | 6   | 4   | 61.20    | 4   | 61.20    | 7   | 107.40   | 7   | 107.40    | 0  |         | 0   |
| Yiddish        | 1   | 0   | 0  | 1   | 0   | 0        | 0   | 0        | 1   | 6.60     | 1   | 6.60      | 0  |         | 0   |
| Total          | 950 | 350 | 29 | 571 | 239 | 4,943.29 | 305 | 6,837.42 | 426 | 8,148.45 | 527 | 10,983.30 | 42 | 125.00+ | 155 |

\* Multiple subscriptions which lacked price information and/or circulation counts, or were received as gifts or exchanges.

number of titles that circulate with various frequencies. Where circulation data for a given title were available from more than one library, we used the highest figure for our tabulation.

The impact of applying various decision rules is discussed in the following sections. These decision rules are suggested as examples in order to indicate the extent of subscriptions that might be affected and to show how the tabulated data could be used. Also, we applied our sample decision rules only to the UC system. Given the same rules, slightly higher savings could be effected if they were applied to a larger system of libraries such as Region XI libraries. A summary of the results of applying several decision rules, such as those described below, is given in Table 4.

1. *Cancel Subscriptions in Excess of Two, If Less Than 1.0 Circulation per Year.* If we assume that: any current serial title subscribed to by only one or two UC libraries should be continued, regardless of the extent of circulation or other indicators for that title, and total UC subscriptions in excess of two should be cancelled if the average number of circulations per year was less than 1.0; then a total of 239 subscriptions could be cancelled from this list, at a saving of over \$4,900 per year to the UC system.

2. *Cancel Subscriptions in Excess of Two, If Less Than 2.0 Circulations per Year.* With the same conditions as above and a further requirement that a serial circulate an average of at least 2.0 times per year, a total of 305 subscriptions could be cancelled from this list, at a saving of over \$6,800 per year to the UC system. (Reducing UC subscriptions to one for the entire system would further increase the potential number of cancellations for these two situations.)

3. *Cancel Subscriptions in Excess of One, If Less Than 1.0 Circulation per Year.* If we assume that: any current serial title subscribed to by only one UC library should be continued, regardless of the extent of its circulation or other indicators and total UC subscriptions in excess of one should be cancelled if the average number of circulations per year was less than 1.0; then a total of 426 subscriptions could be cancelled from this list, at saving of over \$8,100 per year to the UC system.

4. *Cancel Subscriptions in Excess of One, If*

*Less Than 2.0 Circulations per Year.* With the same conditions as above and an additional requirement that a serial circulate an average of at least 2.0 times per year, a total of 527 subscriptions could be cancelled from this list, at a saving of almost \$11,000 per year to the UC system.

5. *Cancel All Titles Not Covered by At Least One Secondary Service.* With the decision rule that all subscriptions should be cancelled for titles not covered by at least one of the secondary services considered in this study (*BA, CA, EM, IM, SCD*), a total of forty-two subscriptions could be cancelled from this list, at a saving of at least \$125 per year to the UC system. (Some price information was not available for these forty-two subscriptions.)

#### CONCLUSION

The method of approach used in this study is workable and leads to some very useful planning information with a relatively modest amount of effort. Once completed for a given group of titles, the same format and structure can readily be used to update information in a year or two to reflect changes in holdings, prices, and other factors. In terms of the identification of candidate titles for cancellation, this data collection and analysis effort, particularly when applied on a regional basis, very definitely seems to be a good investment of time and resources. We recommend that this type of analysis be applied to other groups of serials as well.

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