Open Versus Closed Periodicals Stacks in a Research Library: How to Study The Question

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> If one defines a library as a collection organized for use, access to it is essential. The question then becomes whether this access is more successfully accomplished through the use of traditional bibliographical sources or through the bibliothecal approach which allows browsing in the shelves. (Rovelstad, p. 457.)

While trying to research a paper topic relating to scientific decision-making, I became frustrated by the number of missing periodicals. I was in a major university library, and four out of four of the articles I needed were missing. Moreover, I spent forty-five minutes looking for them.

This frustration led to a healthy disgust for a system that fails to fulfill its function as a source of information. When I vocalized my frustration to my professor, he suggested that I do a paper concerning a more optimal library system. "Thanks, I will," I said, and this paper is the result.

The difficulty of finding periodicals, I felt, could be alleviated by closed stacks. As the periodicals stacks are now, everyone has access to them. Although there is an electronic detection system, only random periodicals are tagged—even then, only one page is tagged. Many issues are stolen, have their pages ripped out, or are hidden in the stacks. Most of the stolen or destroyed issues seemed to belong to the AP section (a Library of Congress call number which includes general subject magazines such as *Time* and *Newsweek*). I hypothesized that closing off this section would do the most towards making all periodicals more available.

Surveying Availability

In an attempt to investigate my hypothesis, I came up with the idea of conducting an availability study to determine what percent of the issues sought by library users were actually on the library shelves. The percentage of issues

Ed. Note: Ms. Baron's article was a senior seminar paper in Economics at NCSU. When she sent it to me I was intrigued that a student presented a clear understanding of a basic problem in library mangement. My intrigue and appreciation for the solutions presented caused me forthwith to provide my professional colleagues with the content of Ms. Baron's study.

not found could then be broken down by call numbers. This availability study was done with the use of a worksheet given to people at the indices and the serials catalog. An explanation of the worksheet was given to each person approached. The shortcomings of the worksheet became obvious, however:

1. Twenty out of one hundred worksheets were returned. Out of that 20 percent, only two-thirds of the participants had followed the instructions and handed back estimable worksheets;

2. Out of the percentage of issues not found, I had little way of knowing the causes. Was an issue missing due to the fact that it had indeed been stolen or mutilated? Or was it due to the fact that the participant did not know how to look for the issue? Moreover, how many of those issues not found were checked out or were at the bindery? Apparently, I should have added a column entitled "Reason for Not Being Found." This, however, would have made the worksheet harder to fill out, and may have drastically cut down the return rate of the worksheets.

In the end, I took seven of the finished worksheets into the stacks myself to investigate further the participant's claims. This time, if the issues were not found, I went to the serials service desk to try to find the causes. The final breakdown is as follows:

TABLE 1
Worksheet Results

Call Number	Number of Issues Searched	Number of Issues Not Found
AP (general)	9	3
A-P (social sciences and humanities)	16	4 (3)
Q-Z (empirical sciences)	15	6 (2)
Total	40	13 (5)

One issue belonging to the A through P subset (social sciences and humanities) was not found because it was located in the Design Library, and the participant was not willing to check there at that time. Two of the issues not found in the Q through Z category (empirical sciences) had been cancelled or discontinued, and two others in the same section were at the bindery. So, the real number of issues not found (those that should have been on the shelf but were not) was three instead of four in the A through P section and two instead of six in the Q through Z section. (These numbers are shown in parentheses on the chart.) The percentage of AP issues not found was 33 percent, the percentage of A through P issues not found was 18.8 percent, and the percentage of Q through Z issues not found was 13.3 percent.

Replacement Costs—An Added Factor

The results of the worksheet, through sketchy, tended to show that the AP section was indeed a problem area. The Binding Supervisor agreed that the AP secton had a large share of mutilation but that it constituted a fairly small proportion of replacement costs. Many of the AP's are backed up by second subscriptions, prebound volumes, and microfilm. This information brought an interesting thought—that although second subscriptions, pre-bound volumes, and microfilm back-ups constitute a cost of leaving AP shelves open, perhaps this cost is lower than the cost of replacing serials from another subset. The empirical science serials (Q-Z), for example, may be extremely expensive to replace. Technical journals can be quite costly. Would it be more efficient to close off that subset which involves the highest replacement costs?

To determine yearly replacement figures for serials, I visited the Acquisitions Department. In looking through the file of retired replacement orders (those which have been successfully reordered), I found that in the year July 1980 to June 1981, 19 AP issues, 137 A-P issues, 280 Q-Z issues, and 7 reference issues had been replaced. The fact that only 19 AP issues were reordered is interesting. The small number may refute my hypothesis that the AP section is a problem area, or it may show the extent to which back-ups are provided in the form of double subscriptions, etc. The other surprising fact is that the number of Q-Z's replaced is about double that of the A-P's reordered. Of course, none of these figures are significant until usage is taken into account. With usage rate, a "replacement cost per use" can be figured.

Replacement Cost Per Use

The "replacement cost per use" analysis involves a series of steps. The first step is to calculate the total number of volumes received in a year, for each subset. One could then derive a "percent replaced of total volumes purchased" figure by dividing the number of issues replaced in a subset by the total volume ordered in the subset. (This is shown in Table 2, column c.) For example, if 200 out of 2000 total issues in Subset 1 had to be replaced in a year, the "percent replaced" would be 10.

TABLE 2

Cost of Replacement Per Use

(hypothetical data)

Subset	(a) Number Replaced	(b) Total Number of Volumes Received	(c) Percent Replaced	(d) Average Usage Rate	(e) (b x d) Total Number of Uses	(f) Total Cost of Replacements	(g) (f/e) Cost Per Usage
1	200	2000	10%	10	20,000	$2300	.115
2	100	3000	03%	5	15,000	$4,000	.267
3	500	2000	25%	20	40,000	$3000	.075

The second step would utilize the "average usage rate" of that particular subset (column d). For example, if the library found that the issues in Subset 1 had been used an average of ten times each,[1] the "number of uses per year" (column e) can be derived by multiplying the average usage rate of each volume by the number of volumes received in a year. This figure, when divided into the "total replacement cost per year" (column f), would give the library a "replacement cost per use" (column g). In the example shown for Subset 1 in Table 2, the replacement cost per use is eleven and one-half cents. A goal of a cost-minimizing library would be to minimize this "replacement cost per use." Thus the subset with the highest replacement cost per use would be a potential subset to be closed off from the public.

Cost of Disappointment and Other Costs

Of course, the cost of replacements per usage is only one of many costs to be considered when looking at the issue of closed versus open stacks. Another cost is the disappointment of the reader when he or she cannot find an issue. This could be called the "cost of disappointment." This cost may be transformed into a quantitative expense by assigning an arbitrary value to each disappointment—say, ten cents. Cards could be placed in the library to count this cost. A person who was not able to find a particular issue would fill out a card listing the title, date, and call number of the issue. The issue could then be checked on by the library staff, and if it remained lost, the card would represent a ten cent cost. (This method would not only show the "cost of disappointment," but also the extent to which users do not know how to use the library. It would also inform librarians of missing issues.) The cards would next be put into categories, either by call number, by subject, or by any other category. Thus, one could isolate the subset with the highest "cost of disappointment."

Another cost not yet mentioned is the cost of running the system. The costs of an open-stacks system fall into two main categories—those of personnel and replacement. The costs in personnel involve shelvers and shelf readers, binding personnel (collating), and replacement personnel. By looking at the amount of hours these persons must work in those jobs specifically related to an open-stacks system (shelf reading, waiting for replacement issues, ordering replacement issues), and multiplying this amount by the persons' salaries, one can become aware of the costs of personnel in monetary terms.

The costs of replacement for open stacks come in many forms. If issues are mutilated, photocopies must be made of the missing pages. This is done through interlibrary loan, and costs run about $1.50 for one to ten copies, and ten cents per page after that. The Interlibrary Loans Department said the total cost in 1979 for copies required due to mutilation or theft is about $188.78. Another cost is the amount paid to publishers, warehouses, or exchanges for replacement issues. The cost of replacements for single issues for the first quarter of 1981 was $1269. Some serials have such a high rate of mutilation that

money is spent for double subscriptions, pre-bound volumes, and microfilms. Another cost of replacement is not measurable; it is the social cost of those issues which are irreplaceable.

Open stacks, however, do have benefits. One is the fact that users can browse. (This is more helpful when looking at serials that are classified by subject, which is not the case in the AP section.) Another is that the shelves are accessible to the public, which closely follows the philosophy that libraries are for the people. Also, open stacks eliminate the need for the pages who would have to be provided to get issues for the public.

The costs of closed stacks can be divided into the same two categories as open stacks—personnel and replacement. Under the category of personnel, the cost of pages would have to be counted. By figuring the number of hours pages would be needed to serve users, and multiplying this number by an hourly wage, the total cost of pages could be figured. The costs of replacement would probably be less due to greater control over the serials, but there would still be some reordering of issues due to mutilation and theft. (A user who wants to take an issue badly enough can usually find a way.)

The benefits of closed stacks are many. Less replacement and collating time would be needed. There would not be the need for second subscriptions, pre-bound volumes, and microfilms as back-ups. The cost of buying replacement issues would go down, and there would be less of a social cost of irreplaceable goods. Also, the availability rate of issues would be higher, and uncertainty and discouragement on the part of students and staff when issues are stolen may be alleviated.

Evaluating the Options

My original hypothesis was that the AP section is mutilated and stolen more than other sections and should therefore be closed off from the public. Although the AP issues do seem to be harder to find, judging from the worksheet results and comments made by the Binding Supervisor, they may also the cheapest to replace. Closing them off may not be the optimal solution. A more in-depth study would then have to be done to determine the replacement cost per use, and any action taken would involve minimizing this cost. Studies should also be done that would measure the "cost of disappoint-

TABLE 3
Cost Per Use Totals

Types of Costs	Open Stacks	Closed Stacks
Replacement	High	Low
Disappointment	High	Low
System	Low	High
Total	?	?

ment" and the cost of running the system. A total of all three costs could then be summarized for both open and closed stacks, as in Table 3.

Table 3 shows that the cost of replacement for all subsets under open stacks is "high," and under closed stacks, is "low." These are hypothetical data, but the idea of dividing the costs into different categories is valuable. Each of these cost categories—replacement, disappointment, and system—could be weighted according to their importance to the library. They could then be totaled for both open stacks and closed stacks.[2]

If the library was interested in closing off only the most costly subsets, a similar table could be used, this time adding all three costs for subset 1, all three costs for subset 2, etc. An example of this is shown in Table 4.

TABLE 4

Costs and Savings Per Use[a]

Subset	Cost Per Usage			Number of Uses Per Year[b]	Savings Per Year
	Open Stacks	Closed Stacks	Savings if Closed		
1	.10	.40	(.30)	20,000	(6000)
2	.50	.30	.20	15,000	3000
3	.40	.10	.30	40,000	12,000

a Hypothetical data (in dollars)

b These figures were taken from Table 2.

Table 4 shows that the cost per use for subset 1 is ten cents under open stacks and forty cents under closed stacks. If the stacks were closed, a dissavings of thirty cents per use would be incurred. If subset 2 were closed, a savings of twenty cents per use would result. If subset 3 were closed, the library would experience a savings of thirty cents per use. For each of these subsets, the savings (or dissavings) per use could then be multiplied by the total number of uses in each subset, rendering total savings for each subset under closed stacks. These totals are shown in the final column of Table 4.

The Challenge

All of these figures are hypothetical, of course. It is up to each library to find its own figures. The methodology is here. The actual figures that apply to each library are there—they simply have to be collected and sorted. It is not a hard study to do, and the results may be valuable. Even if the study concludes that there are no savings to be made by closing off the periodical stacks, the library could be assured that the current serials section is operating at peak efficiency.[3]

Notes

1. This usage rate can be estimated by asking that all issues used be left on tables in the periodicals section. In the process of reshelving the issues, a count can be made of the total issues used per subset in a certain time period. The usage rate would be derived by dividing this count by the total number of issues received in that period.
2. The only problem with this is that the costs for closed stacks can only be estimated. Because the stacks are open now, we can only guess what the replacement, disappointment, and system costs would be. Moreover, with closed stacks, usage may change. It may increase, stay the same, or decrease. This would need to be considered when looking at the costs. For instance, if closed stacks were used, the cost of disappointment may go down due to either an increased ability to find issues or a decrease in the use of periodicals. Therefore, estimates of usage would have to be made in order to find more accurate costs under a closed system.
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